

13 Feb Sem 1/2

Roll No.

Total No. of Pages: 01

Total No. of Questions: 05

BBA/ B.Com. (Hons.)/B.SC (AIML), Semester-1st

ENGLISH

112

Subject Code: 25C2CCU-103/BTHU103/18

M. Code: 96502/ 75085

Date of Examination: 07-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. All questions are compulsory.
2. Question no. 1, 2 & 3 carries TEN marks each.
3. Question no. 4 & 5 carries FIFTEEN marks each.

Q. No.	Question	Course Outcome	Bloom's Level
1.	Identify the process of communication with a relevant diagram.	CO1	L3
2.	Explain the different modes of communication along with a suitable example.	CO2	L5
3.	Construct the precis writing of the given paragraph: Climate change is an urgent global threat driven by greenhouse gas emissions from fossil fuels, deforestation, and industrial activity. Its impacts—melting ice caps, rising seas, severe heat waves, unpredictable rainfall, and stronger storms—are unevenly distributed, with coastal, island, and low lying areas suffering worst, while arid zones face increasing water scarcity. Agriculture, infrastructure, and public health are disrupted even in temperate regions. Developing countries are particularly vulnerable due to limited adaptive capacity. Although solutions such as renewable energy, reforestation, climate smart agriculture, water management, and pollution regulation exist, progress has been hampered by weak political will, inadequate funding, and lack of international cooperation. To avoid ecosystem collapse, species extinction, and human displacement, all stakeholders—governments, businesses, local communities, and individuals—must act decisively in mitigation and adaptation.	CO3	L6
4.	Illustrate the common barriers to business communication with suitable examples.	CO4	L2
5.	Write a letter to the editor of a newspaper about the problems faced by commuters due to the reckless driving of the vehicles.	CO5	L3

NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the student.

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Total No. of Pages: 01

Total No. of Questions: 07

B.Sc. CS, Semester-1st

ENGLISH

Subject Code: BTHU103-18 / 25C2CCU-103

M. Code: 92575 /

Date of Examination: 07-05-2026

Time: 3 Hrs.

Max. Marks: 60**INSTRUCTIONS TO CANDIDATES:**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define effective communication.	CO1	L1
b.	List any two modes of communication.	CO1	L1
c.	Differentiate between verbal and non-verbal communication.	CO2	L2
d.	Explain any two barriers to communication.	CO5	L2
e.	Find out the importance of listening in communication.	CO4	L1
f.	List any two tools of modern communication.	CO3	L1
g.	What is meant by "gist of a passage"?	CO4	L1
h.	Illustrate note-making.	CO5	L2
i.	Infer why vocabulary building is important.	CO2	L2
j.	Identify any two uses of comprehension exercises.	CO3	L2
SECTION-B			
2.	Critique the relevance of listening in effective communication and in your career journey.	CO1	L5
3.	Classify various flow of communication and its uses.	CO2	L4
4.	Examine the components of communication process, with example.	CO2	L4
5.	Evaluate the importance of presentation skills in getting placed in a renowned company.	CO3	L5
6.	Analyze different barriers to communication, with examples.	CO5	L3
7.	Justify the need for effective feedback in leadership roles .	CO4	L5

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1|M-92575



Roll No.

Total No. of Pages: 01

Total No. of Questions: 07

B.Sc. (AI&ML), Semester-1st
PROGRAMMING IN PYTHON
Subject Code: UGCA1914 /25C2PYC-C02
M. Code: 79005

Date of Examination: 19-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** consists of **SIX** questions, each carrying **TEN** marks each and student has to attempt any **FOUR** questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	What is a keyword in Python and name atleast any two keywords?	CO-1	L1
b.	Describe the term indentation in Python and its importance.	CO-1	L2
c.	List atleast two applications of Python.	CO-2	L1
d.	Compare Python and C language. (Give atleast two comparisons)	CO-2	L2
e.	State the term tuple with an example.	CO-3	L1
f.	Outline the use of break and continue statements in loops.	CO-3	L2
g.	Write any two built-in functions in Python.	CO-4	L1
h.	Explain the steps to create and import a module.	CO-4	L2
i.	Define constructor in Python.	CO-5	L1
j.	Interpret how encapsulation and inheritance are implemented in Python classes.	CO-5	L2
SECTION-B			
2.	Compute sum, subtraction, multiplication, division and exponent of given variables input by the user.	CO-1	L3
3.	Compare the major features and limitations of Python with traditional programming languages like C and Java.	CO-2	L4
4.	Interpret various control structures used for iteration and decision-making in Python.	CO-3	L5
5.	Identify the difference between Pass by Value and pass by reference in Python using examples.	CO-4	L3
6.	Simplify the process of garbage collection and object destruction in Python with an example.	CO-5	L4
7.	Explain the concept of Package and Module in Python with an example.	CO-4	L5

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1|M-79005



Total No. of Questions: 07

B.Sc. (AIMLCS), Semester-1st
FUNDAMENTALS OF COMPUTER AND IT
Subject Code: UGCA1902/25C2CCU-102
M.Code: 79004/96523/92570/96534
Date of Examination: 11-05-2026

Max. Marks: 60

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** consists of **SIX** questions, carrying **TEN** marks each and student have to attempt any **FOUR** questions.

4
Laxman
Mohan

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Roll No.

Total No. of Questions: 9

Date : 18-05-2026

Total No. of Pages: 4

B.TECH(ME), Semester-2ND
Subject Name: ELEMENTS OF MECHANICAL ENGINEERING

Subject Code: 25C1MEU-101

M-code: 97872

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
a.	What is meant by resilience? Explain its importance in material selection and design.	CO-1	L1	2
b.	Infer the term factor of safety and explain its importance in engineering design.	CO-1	L2	2
c.	List the different types of constrained motion and explain each with suitable examples.	CO-2	L1	2
d.	Illustrate the principle of inversion of mechanisms and describe how different mechanisms can be obtained from the same kinematic chain.	CO-2	L2	2
e.	Sketch the force convention for a free body diagram and illustrate it with a suitable example.	CO-3	L1	2
f.	Interpret the significance of force and couple in mechanical systems and relate their effects on motion.	CO-3	L2	2
g.	Define one pascal in terms of pressure and explain its physical meaning.	CO-4	L1	2
h.	State the MKS and CGS units of viscosity and explain their significance.	CO-4	L2	2
i.	List and identify the main parts of a centrifugal pump and explain the function of each part.	CO-5	L1	2
j.	Classify the elements of a pump and outline the function of each component.	CO-5	L2	2
SECTION B				20
2.	Calculate the strain energy stored in a bar of length 1.5 m and cross-sectional area 300 mm ² subjected to a tensile stress of 100 MPa, given E = 200 GPa.	CO-1	L3	5
3.	Differentiate between translational motion and rotary motion with clear examples and characteristics.	CO-2	L4	5
4.	Evaluate the concept of inertia force and apply it to solve problems in dynamic analysis of mechanical systems.	CO-3	L5	5
5.	Compare Newtonian and non-Newtonian fluids and judge their flow behavior.	CO-4	L5	5
6.	Evaluate the working efficiency of a hydraulic press in industrial operations.	CO-5	L5	5
SECTION C				20
7.	Compare crank-rocker mechanism and double-crank mechanism obtained from four-bar chain inversion in terms of motion characteristics and practical use.	CO-2	L4	10
8.	Examine surface tension and analyze the phenomenon of capillarity in engineering applications.	CO-4	L4	10
9.	Assess the challenges involved in the operation of hydraulic machines (turbines, pumps, and devices) and suggest suitable measures to improve their performance and reliability.	CO-5	L5	10

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Roll No.

Total No. of Questions: 7

Date : 05-05-2026
Total No. of Pages: 2BSc (Cyber Security), Semester-2nd
Subject Name: OBJECT ORIENTED PROGRAMMING USING C++
Subject Code: 25C2CSU-202 E2

Time: 03:00 Hrs.

Max. Marks: 60

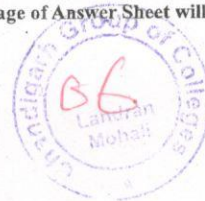
INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
1.a.	State the advantage and disadvantage of Object Oriented Programming?	CO-1	L1	2
1.b.	Illustrate header files used in C++ programming language.	CO-1	L2	2
1.c.	Write the concept of modern Object Oriented Programming language?	CO-1	L1	2
1.d.	Briefly explain member functions in Object Oriented Programming.	CO-2	L2	2
1.e.	Which are the basic features of OOP?	CO-3	L1	2
1.f.	Explain compile-time polymorphism and run-time polymorphism.	CO-3	L2	2
1.g.	Relate Object Oriented Programming with real-world objects.	CO-4	L1	2
1.h.	State the purpose and types of constructors in C++.	CO-4	L2	2
1.i.	Draw the simple diagram of hierarchical inheritance.	CO-5	L1	2
1.j.	Differentiate between Procedure Oriented Language (C) and Object-Oriented Language.	CO-5	L2	2
SECTION B				40
2.	Compare default and parameterized constructors, and assess which method initializes objects more effectively in simple C++ programs.	CO-3	L5	10
3.	Explain dynamic initialization of objects in C++ with suitable example program.	CO-3	L5	10
4.	Compare the differences between function overriding and function overloading with respect to polymorphism.	CO-5	L4	10
5.	Evaluate file handling operations (opening, reading, writing, closing) and determine their importance in real-world applications.	CO-3	L5	10
6.	Justify the usefulness of abstract classes in large object-oriented programs and evaluate how they support code reusability and standardization.	CO-3	L5	10
7.	Explore how ambiguity can occur in operator overloading and suggest methods to avoid such situations.	CO-5	L4	10

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Roll No. Date : 30-04-2026
Total No. of Pages: 2

Total No. of Questions: 7

BSc (AIML)/BSc (Cyber Security), Semester-2nd
Subject Name: OPERATING SYSTEMS
Subject Code: 25C2CCU-205/ UQCA 1923
M. Code: 191715

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
1.a.	List any two functions of an Operating System.	CO-1	L1	2
1.b.	Summarize the importance of the user-hardware interface in operating a computer system.	CO-1	L2	2
1.c.	Define the term Process Control Block (PCB).	CO-2	L1	2
1.d.	Differentiate between pre-emptive and non-pre-emptive scheduling.	CO-2	L2	2
1.e.	Define loading in the context of memory management.	CO-3	L1	2
1.f.	Describe any two page replacement algorithms used in operating systems.	CO-3	L2	2
1.g.	State the role of I/O controllers in managing input and output operations.	CO-4	L1	2
1.h.	Describe the concept of file protection in an operating system with suitable examples.	CO-4	L2	2
1.i.	State the concept of communication in Distributed Operating Systems.	CO-5	L1	2
1.j.	Differentiate between symmetric and asymmetric multiprocessing.	CO-5	L2	2
SECTION B				40
2.	Write the concept of a thread in operating systems and its contribution to faster execution and improved application performance.	CO-1	L3	10
3.	Analyze the necessity of CPU scheduling in an operating system with respect to efficient resource utilization and system performance.	CO-2	L4	10
4.	Justify the FCFS disk system has a request queue containing the following tracks: (82, 170, 43, 140, 24, 16, 190). The initial position of the disk head is at track 50.	CO-3	L5	10
5.	Explain the steps involved in creating, opening, and deleting files in an operating system and how these processes contribute to efficient file management.	CO-4	L5	10
6.	Use the role of layered operating system architecture in improving modularity, system organization, and functionality.	CO-1	L3	10
7.	Compare the characteristics of a Real-Time Operating System with those of a general-purpose operating system in terms of functionality and behavior.	CO-5	L4	10

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Roll No.

Total No. of Questions: 7

Date : 13-05-2026

Total No. of Pages: 2

BSc (Cyber Security), Semester-2nd
Subject Name: FUNDAMENTALS OF CYBER SECURITY
Subject Code: 25C2CSU-201 / UGCA 1971
M. Code: / 91716

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
1.a.	Define the basic principles of computer ethics.	CO-1	L1	2
1.b.	Explain why digital communication systems require security controls.	CO-1	L2	2
1.c.	Discuss how cloud computing has influenced cybersecurity practices.	CO-1	L2	2
1.d.	Name different tools used for handling cyber security incidents.	CO-2	L1	2
1.e.	State why public Wi-Fi networks are risky.	CO-2	L2	2
1.f.	Explain the role of encryption in data security.	CO-2	L2	2
1.g.	What is the purpose of the IT Act?	CO-3	L1	2
1.h.	Describe the mechanisms through which phishing attacks are executed.	CO-3	L2	2
1.i.	State four differences between a debit card and a credit card.	CO-4	L1	2
1.j.	Describe the role of email security practices in preventing cyber threats.	CO-4	L2	2
SECTION B				40
2.	Distinguish the methods used by antivirus software to detect and remove malware.	CO-1	L4	10
3.	Compare the strengths and limitations of cyber security laws in India in controlling cyber crimes.	CO-2	L5	10
4.	Use two-factor authentication methods in real-life scenarios and evaluate their effectiveness in preventing unauthorized access.	CO-2	L3	10
5.	Examine the potential threats and vulnerabilities in digital wallet and UPI transactions.	CO-4	L4	10
6.	Simplify firewall rules and their role in protecting networks from cybersecurity threats.	CO-4	L4	10
7.	Explain the effectiveness of web application security frameworks in preventing vulnerabilities.	CO-4	L5	10

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Roll No.

Total No. of Pages: 01

Total No. of Questions: 07

B.Sc. CS, Semester- 1st
PROBLEM SOLVING USING C

Subject Code: 25C2CSU-101 / UGCA1903

M. Code: 96527 | 92571

Date of Examination: 19-05-2026

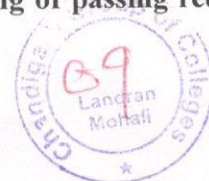
Time: 3 Hrs.**Max. Marks:60****INSTRUCTIONS TO CANDIDATES:**

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** consists of **SIX** questions, carrying **TEN** marks each and student have to attempt any **FOUR** questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define pseudo code in c.	CO-1	L1
b.	Classify operators in C.	CO-1	L2
c.	Define do-while statement in C.	CO-2	L1
d.	Explain the purpose of the scanf() function with syntax.	CO-2	L2
e.	What do you mean by identifiers?	CO-1	L1
f.	What is the purpose of the return statement in a function?	CO-3	L1
g.	Illustrate how is an array declared in C? Give an example.	CO-3	L2
h.	What is the difference between structure and union?	CO-4	L1
i.	Explain how is typedef used in C? Give one example.	CO-4	L2
j.	Compare one-dimensional and multi-dimensional arrays.	CO-3	L2
SECTION-B			
2.	Build the structure of a simple C program and explain each component.	CO-1	L3
3.	Explain the difference between entry-controlled and exit-controlled loops.	CO-2	L5
4.	Classify functions and explain their advantages in structured programming.	CO-3	L4
5.	Explain dynamic memory allocation using malloc(), calloc(), and free().	CO-4	L5
6.	Construct the working of break and continue statements with examples.	CO-2	L3
7.	Examine how arrays are declared, initialized, and processed in C.	CO-3	L4

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11M- 96527 / 92571



Roll No.

Total No. of Questions: 07

Total No. of Pages: 02

B.Sc. (AIML), Semester- 2nd

FUNDAMENTALS OF STATISTICS

Subject Code: 25C2AIU-201 / UGCA1907

M.Code: /79856

Date of Examination: 06-05-2026

Time: 3 Hrs.

Max. Marks:60

INSTRUCTIONS TO CANDIDATES:

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** consists of **SIX** questions, carrying **TEN** marks each and student have to attempt any **FOUR** questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	What are limitations of secondary data?	CO1	L1
b.	Outline the precautions that can be taken to remove distrust of Statistics.	CO1	L2
c.	Differentiate direct personal investigation and indirect oral investigation method.	CO1	L2
d.	What are open end class intervals? Illustrate giving an example.	CO2	L1
e.	Give a continuous frequency (tally) distribution from the following data: 20, 11, 11, 37, 15, 40, 31, 29, 38, 27, 13, 7, 29, 25, 37, 42, 30, 10, 9, 27, 25, 18, 2, 9, 47, 17, 11, 32, 41, 6, 29, 15, 13, 39, 21, 40, 10, 15, 3, 4.	CO2	L2
f.	Summarize the differences between classification and tabulation.	CO2	L2
g.	Write the key note for calculating arithmetic mean for any two types of continuous data series.	CO3	L1
h.	Define weighted mean. Under what circumstances it is preferred in comparison to simple arithmetic mean.	CO3	L2
i.	What are the features of dispersion which makes its evaluation worthy?	CO4	L1
j.	The mean of 100 items is 50 and their standard deviation is 5. Obtain the sum and sum of square of all the 100 items.	CO4	L2
SECTION-B			
2.	Organize a systematic study describing the various methods or rules for rounding off the data.	CO1	L3

3.	Compare the market share of 4 brands of T.V. sets solds in Amritsar and Jalandhar by means of Pie diagram	CO2	L5															
<table><tr><th>Brands of sets</th><th>Units sold in Amritsar</th><th>Units sold in Jalandhar</th></tr><tr><td>Samsung</td><td>480</td><td>625</td></tr><tr><td>L.G.</td><td>360</td><td>500</td></tr><tr><td>Onida</td><td>240</td><td>438</td></tr><tr><td>Sony</td><td>120</td><td>312</td></tr></table>				Brands of sets	Units sold in Amritsar	Units sold in Jalandhar	Samsung	480	625	L.G.	360	500	Onida	240	438	Sony	120	312
Brands of sets	Units sold in Amritsar	Units sold in Jalandhar																
Samsung	480	625																
L.G.	360	500																
Onida	240	438																
Sony	120	312																
4.	Determine the missing frequency of the following data missing frequencies for given mean=35 and N (total no. of students) = 68.	CO3	L5															
<table><tr><th>Marks</th><th>0-10</th><th>10-20</th><th>20-30</th><th>30-40</th><th>40-50</th><th>50-60</th></tr><tr><td>No. of Students</td><td>4</td><td>10</td><td>12</td><td>?</td><td>20</td><td>?</td></tr></table>				Marks	0-10	10-20	20-30	30-40	40-50	50-60	No. of Students	4	10	12	?	20	?	
Marks	0-10	10-20	20-30	30-40	40-50	50-60												
No. of Students	4	10	12	?	20	?												
5.	The arithmetic mean and standard deviation of 20 observations were calculated by a student as 20 and 5 respectively. But while calculating them an item 13 was misread as 30. Calculate correct arithmetic mean and standard deviation.	CO4	L3															
6.	Analyze the following data to find 3rd quartile, 6th decile and 70th percentile.	CO3	L4															
<table><tr><th>Marks</th><th>More than 0</th><th>10</th><th>20</th><th>30</th><th>40</th><th>50</th></tr><tr><td>No. of students</td><td>50</td><td>46</td><td>40</td><td>20</td><td>10</td><td>4</td></tr></table>				Marks	More than 0	10	20	30	40	50	No. of students	50	46	40	20	10	4	
Marks	More than 0	10	20	30	40	50												
No. of students	50	46	40	20	10	4												
7.	The particulars regarding the income of two villages are given below	CO4	L5															
<table><tr><th></th><th>Village X</th><th>Village Y</th></tr><tr><td>No. of People</td><td>600</td><td>500</td></tr><tr><td>Average Income</td><td>175</td><td>186</td></tr><tr><td>Variance of Income</td><td>100</td><td>81</td></tr></table> a) Compare in which village is variation in income is greater. b) Determine combined standard deviation of the village X and village Y put together?					Village X	Village Y	No. of People	600	500	Average Income	175	186	Variance of Income	100	81			
	Village X	Village Y																
No. of People	600	500																
Average Income	175	186																
Variance of Income	100	81																

NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the student.

B.Tech

13/05 (E)

Sem 11

112

Roll No.

Total No. of Questions: 9

B.TECH(All Branches), Semester-1st/2nd
Subject Name: ENGINEERING PHYSICS

Subject Code: 25C1PHU-101

M Code: 96716/96648/96611

Date : 13-05-2026
Total No. of Pages: 02

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
a.	What is meant by a unit cell, and how does it represent the structure of a crystal lattice?	CO-1	L1	2
b.	Summarise the tunneling effect.	CO-1	L2	2
c.	State bremsstrahlung effect.	CO-1	L2	2
d.	Define the term 'Transition temperature' in superconductors.	CO-2	L1	2
e.	Define electromagnetic spectrum.	CO-2	L2	2
f.	Explain the physical significance of divergence of vector.	CO-2	L2	2
g.	What will be the de-Broglie wavelength of an electron having kinetic energy of 600eV?	CO-3	L1	2
h.	Explain the term 'nanomaterials'.	CO-3	L2	2
i.	Describe the role of He gas in a He-Ne Laser.	CO-4	L2	2
j.	Define normalised frequency.	CO-4	L1	2
SECTION B				20
2.	Construct a comparative explanation of conductors, semiconductors, and insulators based on energy band theory.	CO-1	L3	5
3.	(a) Analyze the role of critical magnetic field and examine its effect on the superconducting state of a material. (b) Examine the relationship between critical temperature and critical field, and determine the critical field of the material at 2 K using the given data. Critical temperature of 3.7 K in 0 magnetic field and a critical field of 0.0306 T at 0K.	CO-2	L4	5
4.	Explain the Chemical Vapour Deposition (CVD) method for the fabrication of Carbon Nanotubes and mention its applications.	CO-3	L5	5
5.	Explain the main components of laser along with its functioning.	CO-4	L5	5
6.	Interpret the significance of intramodal dispersion and explain the different types that affect signal transmission in optical fibers.	CO-4	L5	5
SECTION C				20
7.	Derive London Equations for superconductors using Maxwell's equation.	CO-2	L3	10
8.	Apply the concept of the Schrödinger equation to classify its forms and simplify the steps involved in deriving the time-dependent wave equation.	CO-3	L3	10



Q No.	Description	CO	BL	Marks
9.	X-rays of wavelength $\lambda = 0.154 \text{ nm}$ ($\text{Cu K}\alpha$) are incident on a crystal with a cubic lattice parameter $a=0.564 \text{ nm}$. (a) Determine the interplanar spacing d for the (111) planes. (b) Using Bragg's law, determine Bragg angle θ for the first-order ($n=1$) reflection from (111) planes. (c) Estimate the maximum order n of reflection possible for these planes with this wavelength.	CO-1	L5	10

NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the student.

Roll No.

Total No. of Pages:02

Total No. of Questions: 09

B.Tech (All Branches), (Sem-1,2)
PROGRAMMING FOR PROBLEM SOLVING

Subject Code: BTPS101-18

M.Code:75346/93803

Date of Examination: 08-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B & C has 4 questions each.
3. Each question of SECTION of B & C consists of eight marks.
4. Attempt any five questions from SECTION B & C, taking at least 2 questions from each section.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Define the role of compiler in C.	CO-1	L1
b.	List the difference between RAM and ROM	CO-1	L2
c.	Draw a flowchart to calculate the product of two numbers.	CO-2	L1
d.	Compare Implicit and Explicit typecasting.	CO-2	L2
e.	Outline the syntax of Do-while loop.	CO-3	L2
f.	Name any two jumping statements.	CO-3	L1
g.	Explain the term array with example.	CO-4	L2
h.	Define function. How to use array in function.	CO-5	L1
i.	Show how pointers are used to store address of another variable.	CO-6	L2
j.	State the working of Binary search.	CO-5	L2
SECTION-B			
2.	Distinguish between Structure and Union with example.	CO-6	L4
3.	a) Evaluate the working of the while loop in C. b) Justify its use by constructing a program to determine whether a given number is a palindrome or not.	CO-3	L5
4.	Select recursion in C programming to develop a program that prints the Fibonacci series for N terms.	CO-5	L3
5.	Apply logical operators to develop the algorithm and write the source code in C to find the smallest number among three numbers.	CO-2	L3
SECTION-C			
6.	Assess the role of input and output devices.		

	support your evaluation with appropriate examples.		
7.	Evaluate the syntax of file pointer. Explain using source code, read and write operations of file handling in C	CO6	L5
8.	Apply the concept of Bubble Sort to develop the algorithm and write the source code.	CO5	L3
9.	Analyze the different types of errors in C programming and illustrate each with suitable examples.	CO2	L4

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Roll No.

Date: 08-05-2026

Total No. of Questions: 9

Total No. of Pages: 2

B. TECH (All Branches), Semester-1st/2nd

Subject Name: PPS using Python

Subject Code: 25C1CSU-102

M.Code:96572

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL
SECTION A			
a.	What is functionality of bitwise operator in Python programming?	CO-1	L1
b.	Outline the working of float and string datatypes with syntax.	CO-1	L2
c.	Write the expected output for given problem statement in python. print(10 // 3)	CO-2	L1
d.	Summarize the difference between / and // operators for numbers with the help of an example	CO-2	L2
e.	List the importance of function call with syntax.	CO-3	L1
f.	Outline any two build in methods of numpy package with example.	CO-3	L2
g.	Find the error and missing statement: class _____ (Exception): pass try: raise MyError except MyError: print("Error")	CO-4	L1
h.	Explain working of os.listdir() of file directory.	CO-4	L2
i.	List the working of a Label using text, bg, and fg properties.	CO-5	L1
j.	Explain the use of Entry() method in python.	CO-5	L2

Q No.	Description	CO	BL
SECTION B			
2.	Apply operator precedence and associativity rules to solve the expression $20 - 4 * 3 + 2$. Develop a Python program to display the result.	CO-1	L3
3.	Analyze the logic to design a Python program to generate the number of choices on the bases of number of days in a week using match case statements.	CO-2	L4
4.	Explain the working of actual parameter and formal parameter in function using python.	CO-3	L5
5.	Justify python program that evaluates a person's eligibility to vote and raises a user-defined exception when the condition is not satisfied.	CO-4	L5
6.	Compare the working of Canvas widget and label widget using python programming.	CO-5	L5
SECTION C			
7.	Examine the working of count (), split (), upper (), strip () method on the string data type using programming example.	CO-2	L3
8.	a) Inspect the utilization of exception handling by developing a Python program that reads a number from the user and handles invalid input (ValueError). b) Examine its working using algorithm.	CO-4	L4
9.	a) Evaluate the working of GUI application using a "Menu Bar" with multiple menu options. b) Explain the algorithm for the above mentioned statement.	CO-5	L5

NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the student.

Roll No.

112

Date : 06-05-2026

Total No. of Questions: 9

Total No. of Pages: 2

B.TECH(All Branches), Semester-1st/2nd

Subject Name: CHEMISTRY-1

Subject Code: 25C1CHU-101 E2

M. Code : 96573

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
a.	Explain the terms: orbit and orbital.	CO-1	L1	2
b.	Summarize reasons for deviation of real gases from ideal behavior.	CO-1	L2	2
c.	Define strong and weak acids and bases.	CO-2	L1	2
d.	What do you mean by stress corrosion?	CO-2	L1	2
e.	Why is TMS used as an internal standard in NMR spectroscopy.	CO-3	L1	2
f.	Outline selection rules for IR spectroscopy.	CO-3	L2	2
g.	How does atomic radius vary as we move along a period and down the group?	CO-4	L1	2
h.	Explain halogenation of alkanes through an example.	CO-5	L2	2
i.	Which of the following is not a nucleophile: H_2O , BF_3 , NH_3 , OH^- ?	CO-5	L1	2
j.	Recall one example of Functional isomerism.	CO-6	L1	2
SECTION B				20
2.	Simplify Vander Waal equation of state from ideal gas equation to find the behavior of real gases. Also, list the significance of Vander Waal's constants.	CO-1	L4	5



Q No.	Description	CO	BL	Marks
3.	Examine the solubility product of PbCl_2 if the solubility of PbCl_2 is 4.448g/litre.	CO-2	L4	5
4.	Determine the number of signals expected in the spectra of the following compounds: a) $\text{CH}_3\text{COOCH}_3$ (methyl acetate) b) $\text{CH}_3\text{-CH}_2\text{=CH-CH}_3$ (2-butene) c) CH_3OH (methanol) d) C_6H_6 (Benzene)	CO-3	L5	5
5.	(a) Justify the statement "The electron affinity of Be and N are almost zero while that of Ne is zero". (b) Compare the ionisation energies of Be and Mg elements.	CO-4	L5	5
6.	Examine the following molecules for their enantiomers and assign R/S configurations to each isomer: (a) 3-bromohexane (b) 2-bromobutane.	CO-6	L4	5
SECTION C				20
7.	(a) Deduce Schrodinger wave equation for particle in one dimensional box using quantum mechanics. (b) Determine ΔE for 1,3 butadiene by making use of its solutions.	CO-1	L5	10
8.	Explore the bond angles, geometry and structures of (i) ClF_3 (ii) XeF_2 (iii) BF_3 (iv) BeF_2 molecules using VSEPER theory.	CO-2	L4	10
9.	Assess the esterification process involved in the synthesis of Aspirin from salicylic acid. List various uses of aspirin as well.	CO-5	L4	10

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Sem - 1, 2

Total No. of Pages:02

Subject Code: 25C1EMU-201

Date of Examination: 30-04-2026

Max. Marks: 60

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION-B contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. SECTION C contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Show that the following system of linear equations is consistent: $5x + y = 2, \quad 4x + 2y = 1$	CO-1	L1
b.	Interpret inverse of a matrix using Gauss Jordan Method for matrix $A = \begin{bmatrix} 1 & 1 & 2 \\ 1 & 3 & 2 \\ 0 & 1 & 2 \end{bmatrix}$.	CO-1	L2
c.	Interpret value of 'r', for which the given system of equations has unique solution: $x - 2y - z = -1, \quad 3x - y + 2z = 1, \quad y + rz = 1$.	CO-1	L2
d.	What is dimension of zero vector space?	CO-2	L1
e.	Interpret A^{-1} by Cayley Hamilton Theorem, $A = \begin{bmatrix} 1 & -2 \\ 2 & 3 \end{bmatrix}$.	CO-2	L2
f.	Find the Sum and Product of the Eigen values of the matrix: $A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$.	CO-2	L2
g.	State necessary and sufficient conditions for the differential equation $M dx + N dy = 0$ to be exact.	CO-3	L1
h.	Obtain the differential equation of all parabolas whose axes are parallel to y – axis.	CO-3	L2
i.	Find the partial differential equation of the function $z = f(x^2 + y^2)$.	CO-4	L1

j.	Explain Particular Integral for a Homogenous Linear Partial Differential Equation with constant coefficients	CO-4	L2
SECTION-B			
2.	Test the system for consistency by rank method $x + 2y + z = 3,$ $2x + 3y + 2z = 5,$ $3x + 9y - z = 4,$ $3x - 5y + 5z = 2.$	CO-1	L4
3.	Simplify the following system of linear equations to find its basis and dimension: $x + 2y + 2z - s + 3t = 0,$ $x + 2y + 3z + s + t = 0$ $3x + 6y + 8z + s + 5t = 0$	CO-2	L4
4.	A particle is moving with Simple Harmonic Motion of period 30 seconds, travels 15 cm from position of rest in 5 seconds. Find amplitude, maximum velocity and velocity at the end of 5 seconds.	CO-3	L5
5.	Solve $\frac{\partial^3 z}{\partial x^3} - 7 \frac{\partial^3 z}{\partial x \partial y^2} - 6 \frac{\partial^3 z}{\partial y^3} = \cos(x + 2y).$	CO-4	L3
6.	Determine the surface passing through the parabolas $z = 0, y^2 = 4ax$ and $z = 1, y^2 = -4ax$ and satisfying the differential equation $x r + 2 p = 0$.	CO-4	L5
SECTION-C			
7.	Examine whether the following matrix $A = \begin{bmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{bmatrix}$ is diagonalizable. If so obtain the matrix P such that $P^{-1} A P$ is a diagonal matrix.	CO-2	L4
8.	Solve Cauchy's homogenous linear equation: $x^2 \frac{d^2 y}{dx^2} - x \frac{dy}{dx} + 2y = x \log x.$	CO-3	L3
9.	Determine the values of a and b for which the system of equations has: $x - 2y + 3z = 1$ $x + y - z = 4$ $2x - 2y + az = b$ (a) A unique solution (b) Infinitely many solutions. (c) No solution. Also find solution.	CO-1	L5

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Total No. of Questions: 09

B.Tech (CSE/IT/AIML/AIDS). Semester 2nd

MATHEMATICS-2

Subject Code: BTAM-204-18

M.Code:76257/91960

Date of Examination: 30-04-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying two marks each.
2. SECTION-B & C have FOUR questions each.
3. Each question of SECTION B & C consists of eight marks.
4. Attempt any FIVE questions from SECTION B & C, taking at least two questions from each section.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Find the median of this set of data: 92, 82, 80, 93, 78, 75, 95, 77 and 79.	CO-1	L1
b.	State any two merits of mean.	CO-1	L2
c.	Explain types of Kurtosis.	CO-1	L2
d.	Define binomial distribution.	CO-2	L1
e.	A continuous Random Variable has a pdf $(x) = cx^2, 0 \leq x \leq 1$. Obtain value of c.	CO-2	L2
f.	It is known that population of a certain city is 45% female and 55% male. Suppose that 70% of males and 10% of females smoke. Interpret the probability that smoker is a male.	CO-2	L2
g.	If $\bar{X} = 25$, $\bar{Y} = 120$ and $b_{xy} = 2$, find value of X when Y is 130.	CO-3	L1
h.	If the regression coefficients are 0.8 and 0.2, Obtain the value of coefficient of correlation?	CO-3	L2
i.	What do you understand by term null hypothesis?	CO-4	L1
j.	Explain type-I and type-II error in sampling.	CO-4	L2

SECTION-B

2.	Compute the mean of the following set of marks:																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the student.

2|M-76257/M-91960

11M-76257/M-91960



Aug 2026

Max. Marks: 60

Date of Examination: 30-04-2026

SECTION-C

ing Cauchy -Residue theorem, solve:

MATHMATICS-2

Subject Code:BTAM203-18

M.Code:76256/91959

Date of Examination: 30-04-2026

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is **COMPULSORY** consisting of TEN questions carrying two marks each.
2. SECTION-B & C have FOUR questions each.
3. Each question of SECTION B & C consists of eight marks.
4. Attempt any FIVE questions from SECTION B & C, taking at least two questions from each section

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define linear differential equation with example.	CO-1	L1
b.	Classify whether the equation $(y + xy^2)dx + (x - x^2y)dy$ is exact or not.	CO-1	L2
c.	Find the general solution of $y'' - 2y' + y = 0$.	CO-2	L1
d.	Obtain the general solution of $(D^2 - 6D + 9)y = 0$.	CO-2	L2
e.	What are Necessary and sufficient conditions for the function $f(z)$ to be an analytic function?	CO-3	L1
f.	Show that the function $v(x, y) = \log(x^2 + y^2) + x - 2y$ is harmonic.	CO-3	L2
g.	Define bilinear transformation with example.	CO-4	L1
h.	Interpret the type of singularity for $\tan(z)$ at $z = 0$.	CO-4	L2
i.	Find the singularity of $\frac{1}{\sin z - \cos z}$ at $z = \frac{\pi}{4}$.	CO-5	L1
j.	State Cauchy Residue Theorem.	CO-5	L2
SECTION-B			
2.	Solve the differential equation: $(3xy^2 - y^3)dx - (2x^2y - xy^2)dy = 0$.	CO-1	L3
3.	Solve: $(1 - x^2)\frac{d^2y}{dx^2} + 2y = 0$ at $x = 0$ given that $y(0) = 4, y'(0) = 5$.	CO-2	L3
4.	If $f(z) = u + iv$ is an analytic function of z and $u - v = \frac{\cos x + \sin x - e^{-y}}{2 \cos x - e^{-y}}$ Examine $f(z)$ subject to the condition $f\left(\frac{\pi}{2}\right) = 0$.	CO-3	L4
5.	Prove that $\int_{-\infty}^{\infty} \frac{dx}{(z^2+1)^3}$ by applying calculus of residue.	CO-4	L3

11M-76256/M-91959

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B.Tech (ECE), Semester 2nd

MATHEMATICS-II

Subject Code: BTAM-202-18

M.Code:76255/91958

Date of Examination: 30-04-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

2. SECTION-B & C have FOUR questions each.

3. Each question of SECTION B & C consists of eight marks.

4. Attempt any FIVE questions from SECTION B & C, taking atleast two questions from each section.

Q. No.	Question	Course Outcome	Bloom's Level
	SECTION-A		
1.	Answer briefly:		
a.	Find the order and degree of differential equation $\left(\frac{d^2y}{dx^2}\right)^3 + \left(\frac{dy}{dx}\right)^2 + y = 0$.	CO-1	L1
b.	Explain Clairaut's equation with an example.	CO-1	L2
c.	Show that the given equation is exact $(x^2 - 4xy - 2y^2)dx + (y^2 - 4xy - 2x^2)dy = 0$.	CO-1	L2
d.	Find complete solution of differential equation $(D^2 + 6D + 9)y = 0$.	CO-2	L1
e.	Obtain the solution of $y' + 4xy + xy^3 = 0$.	CO-2	L2
f.	Classify the given partial differential equation $u_{xx} + 4u_{xy} + u_{yy} = 0$.	CO-2	L2
g.	Define forward difference operator (Δ).	CO-3	L1
h.	Show that $\delta = E^{\frac{1}{2}} - E^{-\frac{1}{2}}$.	CO-3	L2
i.	State the general formula of Runge-Kutta 4th order method (RK4).	CO-4	L1
j.	Explain the Taylor's Series method.	CO-4	L2

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SECTION-B													
2.	Solve $(D^2 - 3D + 2)y = 2e^x \cos \frac{x}{2}$	CO-1	L3										
3.	Apply Lagrange's linear partial differential equation to determine the general solution of the PDE $yzp + zxq = xy$.	CO-2	L3										
4.	Evaluate the integral $\int_0^2 \frac{x^2}{x^3+5} dx$ with 9 ordinates by Simpson's 1/3rd rule.	CO-3	L5										
5.	Examine the application of the Runge-Kutta fourth-order method to compute the value of $y(0.1)$. given that $y = 1$ when $x = 0$ and $\frac{dy}{dx} = y + x^2$.	CO-4	L4										
SECTION-C													
6.	Use Milne's Predictor corrector method to evaluate the integral of $\frac{dy}{dx} - 4y = 0$ at $x = 0.4$ given that <table><tr><td>x</td><td>0</td><td>0.1</td><td>0.2</td><td>0.3</td></tr><tr><td>$y(x)$</td><td>1</td><td>1.492</td><td>2.226</td><td>3.320</td></tr></table>	x	0	0.1	0.2	0.3	$y(x)$	1	1.492	2.226	3.320	CO-4	L5
x	0	0.1	0.2	0.3									
$y(x)$	1	1.492	2.226	3.320									
7.	Solve $(D^2 - 3DD' + 2D'^2)z = e^{2x+3y} + \sin(x - 2y)$. $xe^{-x} + \sin x = 0$.	CO-2	L3										
8.	Analyze the equation using Newton Raphson method	CO-3	L4										
9.	Evaluate $y - 2px = \tan^{-1}(xp^2)$.	CO1	L5										

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B.Tech (All Branches), (Sem.-1, 2)

CHEMISTRY-I

Subject Code: BTCH-101-23

M.Code: 93800

Date of Examination: 06-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying two marks each.
2. SECTION-B & C have **FOUR** questions each.
3. Each question of SECTION B & C consists of eight marks.
4. Attempt any **FIVE** questions from SECTION B & C, taking at least two questions from each section.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What kind of molecules shows IR spectra?	C03	L1
b.	Give two methods to prevent corrosion.	C02	L2
c.	Outline lewis concept of acids and bases.	C04	L2
d.	Which out of Cl ⁻ and Cl have the smallest size and why?	C04	L1
e.	Summarize ionization energy term through an example.	C01	L2
f.	Explain rusting of iron through example.	C06	L2
g.	Compare Electrophile and Nucleophile through examples.	C05	L2
h.	Label R and S configuration to the following:		
	$\begin{array}{c} \text{H} \\ \\ \text{Cl} - \text{C} - \text{CHO} \\ \\ \text{CH}_3 \end{array}$	C06	L1
i.	Illustrate the term Chromophores through suitable example.	C03	L2
j.	Define reaction intermediates and name any one reaction intermediate?	C05	L1
SECTION-B			
2.	Explain the molecular orbital diagram for O ₂ molecule and by making use of MOT compare (a) stability (b) Bond order (c) bond length (d) magnetic behavior of O ₂ , O ₂ ⁺ and O ₂ ⁻ species.	C01	L5
3.	(a) Express covalent and van der Waals radii using suitable examples.	C04	L3

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B. Tech

Roll No.

Total No. of Pages: 2

Total No. of Questions: 09

B.Tech (All branches), Semester 2nd
ENGINEERING MATHEMATICS - II
Subject Code: BTAM-201-23

M.Code: 93811

Date of Examination: 30-04-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

- SECTION-A is COMPULSORY consisting of TEN questions carrying two marks each.
- SECTION-B & C have FOUR questions each.
- Each question of SECTION B & C consists of eight marks.
- Attempt any FIVE questions from SECTION B & C, taking at least two questions from each section.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Find the rank of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 1 & 1 & 1 \end{bmatrix}$.	CO-1	L1
b.	Explain echelon form of a matrix.	CO-1	L2
c.	Define rank nullity theorem with example.	CO-2	L1
d.	Explain whether the vectors $\{(1, 1, 1), (1, -1, 1), (3, -1, 3)\}$ are linearly dependent or not.	CO-2	L2
e.	Find the Eigen values of the matrix $\begin{bmatrix} 1 & 2 \\ 3 & 1 \end{bmatrix}$.	CO-3	L1
f.	Show that eigen vector of matrix $\begin{bmatrix} 2 & -2 & 3 \\ 1 & 1 & 1 \\ 1 & 3 & -1 \end{bmatrix}$ corresponding to the eigen value 1 is $(-1, 1, 1)$.	CO-3	L2
g.	Interpret whether the given equation $(1 + x^2) dy + 2xy dx = 0$ is exact.	CO-4	L2
h.	Show that the orthogonal trajectories of the curve whose differential equation is given by $y = 2xy dx$ are $2x^2 + y^2 = 2c$, where c is an arbitrary constant.	CO-5	L2
i.	Define homogeneous partial differential equations with constant coefficients.	CO-6	L2
j.	Find the auxiliary equation of the following Lagrange's equation: $yzp + zxq = xy$.	CO-6	L1

SECTION-B			
2.	Solve the system of linear equations using Gauss-Jordan method: $x + y + z = 6, 2x - y + 3z = 14, y + 2z = 8$.	CO-1	L3
3.	Let the linear transformation $T: R^4 \rightarrow R^3$ be defined as $T(x, y, z, w) = (x + y, y - z, z - w)$. Analyse the rank and nullity of T .	CO-2	L4
4.	Determine A^{-1} for the matrix $A = \begin{bmatrix} 2 & 1 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 2 \end{bmatrix}$ by using Cayley-Hamilton theorem.	CO-3	L5
5.	Evaluate the solution of the given differential equation $\sec^2 x \tan y dx + \tan x \sec^2 y dy = 0$.	CO-4	L5
SECTION-C			
6.	Solve the general solution of $r + 4s + 4t = e^{2x+y}$.	CO-6	L3
7.	Examine the linear map $T: R^3 \rightarrow R^3$ define by $T(x, y, z) = (x + y + z, 2x + 2y + 2z, 3x + 3y + 3z)$ and assemble the associated matrix corresponding to the standard basis.	CO-2	L4
8.	Solve the following differential equation: $4y'' - 4y' + y = \frac{x}{e^x}$.	CO-4	L3
9.	The initial value problem governing the current 'i' flowing in series R.L. circuit when voltage $V(t) = t$ is applied is given by $iR + L \frac{di}{dt} = t; t \geq 0; i(0) = 0$ where R, L are constants. Evaluate the current $i(t)$ at time t .	CO-5	L5

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Roll No.

Total No. of Questions: 9

Date : 11-05-2026
Total No. of Pages: 2B.TECH(All Branches), Semester-1st /2nd
Subject Name: PROGRAMMING FOR PROBLEM SOLVING USING C
Subject Code: 25C1CSU-101

Time: 03:00 Hrs.

Mcode! 96719/96614

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
a.	Define syntax errors and logical errors.	CO-1	L1	2
b.	Explain the difference between RAM and ROM.	CO-1	L2	2
c.	What is ternary operator and give its example?	CO-2	L1	2
d.	Interpret the output of the program: <code>int x = 10; printf("%d", x++);</code> and explain increment operator.	CO-2	L2	2
e.	What is a string in programming with example?	CO-3	L1	2
f.	Explain a program to perform arithmetic operations using 1-D Array?	CO-3	L2	2
g.	What are local variables in function in c program?	CO-4	L1	2
h.	Explain merge sort with example.	CO-4	L2	2
i.	Recall the operator used to access members of a structure.	CO-5	L1	2
j.	Write the syntax of <code>free()</code> .	CO-5	L2	2
SECTION B				20
2.	Solve the problem of comparing three numbers using a C program and flowchart to determine the smallest among three numbers.	CO-1	L3	5
3.	Construct a C program using an if-else if ladder to determine and display the roots of a quadratic equation based on the discriminant.	CO-2	L3	5
4.	Explain the syntax of four string manipulation functions in C with suitable program and justify your explanation clearly.	CO-3	L5	5
5.	Distinguish between call by value and call by reference in C programming with suitable examples to highlight their differences.	CO-4	L5	5
6.	Justify the importance of dynamic memory allocation in C programming by explaining the role of <code>realloc()</code> and <code>calloc()</code> functions, and explain their use with the help of a suitable program.	CO-5	L5	5
SECTION C				20
7.	Examine the functionality of control structures used in C programming and demonstrate your explanation with suitable C program examples.	CO-2	L4	10
8.	Simplify the array 29, 10, 14, 37, 13 by applying Selection Sort and solve its working, algorithm and program step by step using a C program.	CO-3	L4	10
9.	a.Choose an appropriate structure in C to represent 4 student's record containing roll number, name, and marks.Determine how to input and store details of five students, then evaluate the correctness by displaying the stored data. Select the proper use of structures and loops to implement the solution. b. Explain the concept of a Union in C through C program.	CO-5	L5	10

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Roll No.

Total No. of Pages: 01

Total No. of Questions: 07

B.Sc. (AIML), Semester- 2nd

DATA STRUCTURES

Subject Code: 25C2DSC-C03/ UGCA1915

M.Code: 179858

Date of Examination: 13-05-2026

Time: 3 Hrs.

Max. Marks:60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION-B consists of **SIX** questions, carrying **TEN** marks each and student have to attempt any **FOUR** questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	List the advantages of dynamic memory allocation over static.	CO1	L1
b.	Describe time complexity of loop: for(i=1; i<=n; i++)	CO1	L2
c.	How many elements can be stored in an array of size 10?	CO2	L1
d.	If stack size = 5 and, 5 elements are inserted, what is next condition?	CO2	L1
e.	In a BST, which side stores smaller elements?	CO3	L1
f.	Construct BST for: 40,20,60,10.	CO3	L2
g.	If n=8, how many comparisons in binary search (approx)?	CO4	L1
h.	If array = [2,4,6,8,10], explain middle index in binary search.	CO4	L2
i.	Define hash function.	CO5	L1
j.	Explain adjacency matrix representation.	CO5	L2
SECTION-B			
2.	Compare Binary search and Linear search.	CO1	L4
3.	Insert elements 5, 10, 15 in a queue and illustrate front & rear.	CO2	L4
4.	Explain the advantages of linked lists over arrays in real-world scenarios with proper justification.	CO3	L5
5.	Sort the array [9, 3, 7, 1] using Bubble Sort and count number of swaps.	CO4	L5
6.	Apply Linear Search for 25 in [10, 20, 25, 40]. Write the step-by-step procedure.	CO4	L3
7.	Analyze different collision resolution techniques used in hashing.	CO5	L4

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Roll No.

Total No. of Questions: 9

Date : 15-05-2026

Total No. of Pages: 3

B.Tech.(All Branches), Semester-1st/2nd
ENGLISH & PROFESSIONAL COMMUNICATION
Subject Code: 25C1EPU-101

M.Code: 96563/ 96571/ 96579/ 96587/ 96595/ 96603/ 96620

Max. Marks: 60

Time: 03:00 Hrs.

INSTRUCTIONS TO CANDIDATES:

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL
SECTION A			
a.	Which of the following is/are prefixes: ing, un, ly, er, pre, or, com	CO-1	L1
b.	Extend the given antonym pairs: Sunrise : Sunset = Beginning : _____ Inhale : Exhale = Import : _____	CO-1	L2
c.	Interpret the given sentence and fill the correct articles: _____ Ganges flows from _____ Himalayas.	CO-2	L2
d.	What is a dangling modifier?	CO-2	L1
e.	List any two techniques that can be used to achieve precision in writing.	CO-3	L1
f.	One should avoid personal opinions in a précis. Interpret the reason.	CO-3	L2
g.	State the importance of reading comprehension in improving language skills.	CO-4	L1
h.	Read and interpret the short passage given below to answer the questions that follow: A cool breeze blew in the evening, and the birds began returning to their nests. Simran closed her book and went out for a walk. i. What were the birds doing in the evening? ii. What did Simran do after closing her book?	CO-4	L2
i.	List any two Mechanics of writing.	CO-5	L1



Q No.	Description	CO	BL
j.	Why facts based on research/ investigation/ concrete data are often included in business reports. Do they enhance the effectiveness of written content?	CO-6	L1
SECTION B			
2.	Read the following paragraph carefully and identify all the clichés: Priya was over the moon after her results, but she knew success wouldn't come overnight. She decided to burn the midnight oil because she believed that honesty is the best policy, practice makes perfect, and when the going gets tough, the tough get going.	CO-1	L3
3.	Solve the redundancy in the following sentences: i. The meeting was postponed to a later future date. ii. Please repeat again the instructions once more. iii. The final outcome of the result was announced yesterday. iv. She returned back again to the same place where she had previously lived. v. The basic fundamentals of the subject are very important for beginners.	CO-2	L3
4.	Evaluate the impact of using appropriate and inappropriate cohesive devices on the clarity and meaning of writing. Why is correct usage important for effective communication? Support your answer with suitable examples.	CO-3	L5
5.	Look at these five sentences about making a tea: (1) Finally, pour the tea into a cup and serve it hot. (2) Next, add sugar and milk according to taste. (3) First, boil water in a kettle. (4) Then, add tea leaves and let it simmer for a few minutes. (5) After that, strain the tea into another container. Justify your knowledge of paragraph organization to: i. Arrange these sentences in the correct chronological order. ii. Explain why this order makes the paragraph coherent and easy to follow. iii. Support your opinion with one example that what will happen if there is no coherence in this paragraph.	CO-5	L5
6.	You are the class representative. Some students prefer online classes due to flexibility, while others prefer offline classes for better interaction. The	CO-6	L4

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Q No.	Description	CO	BL
SECTION C			
7.	timetable is also causing confusion, with suggestions for both morning and afternoon sessions. Analyze the above situation and write an email to your principal specifying the different viewpoints of students regarding class mode and timing, comparing the advantages and disadvantages, and suggesting a justified balanced solution that addresses most students' concerns.	CO-2	L4
8.	Read the following paragraph carefully and mark all grammatical, spelling, punctuation, and usage errors. Rewrite the paragraph with corrections. During the onlines classes, many student finds it difficult to concntrate on there studies. The teacher try to explain the concepts clearly, but some students doesn't pay attention. Lack of interaction and technical issue also affects the learning process. It is important that students completes their assignments on time and participate actively in discussions. If they will not focus properly, they may faces problems in exams later.	CO-5	L3
9.	Prepare a speech for the Freshers' Orientation Programme (200-250 words). Ensure proper structure, clarity, and appropriate language while welcoming new students and addressing teachers and senior students. You are working in the facilities department of Luminous Tech, Chandigarh. The office cafeteria has outdated equipment and poor hygiene standards, causing delays in food service and employee complaints. Interpret this situation and prepare a report to be submitted to your Operations Manager that: i. Highlights the current issues in the cafeteria. ii. Explains how these issues affect employee productivity and satisfaction. iii. Recommends appropriate solutions to improve the cafeteria's condition. iv. Suggests a plan for implementing the recommended solutions.	CO-6	L5

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B.Sc-CS, Semester-1st
HUMAN VALUE, DE ADDICTION AND TRAFFIC RULES

Subject Code: 25C2HVC-C01

M.Code: 96529

Date of Examination: 15-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
SECTION-B consists of SIX questions, each carrying TEN marks each and student has to attempt any FOUR questions.

Q. No.	Question	CO	BL
	SECTION-A		
1.	Answer briefly:		
a.	List three examples of empathy. ਸਹਾਂਸ੍ਰਮਤਿ ਕੇ ਤੀਨ ਉਦਾਹਰਣ ਲਿਖਿਓ। ਹਮਦਰਦੀ ਦੀਆਂ ਤਿੰਨ ਉਦਾਹਰਣਾਂ ਦੱਸੋ।	CO-1	L1
b.	State the meaning of Suvidha. ਸੁਵਿਧਾ ਕਾ ਅਰਥ बताइए। ਸੁਵਿਧਾ ਦਾ ਅਰਥ ਦੱਸੋ।	CO-2	L1
c.	Explain the term harmony in I with an example. "ਮੈਂ" ਮੈਂ ਸਾਂਸਮਜਸਧ ਖਾਫ਼ ਕੋ ਏਕ ਉਦਾਹਰਣ ਸਹਿਤ ਸਮਝਾਇਓ। "ਮੈਂ" ਵਿੱਚ ਇਕਸੁਰਤਾ ਸਬਦ ਨੂੰ ਇੱਕ ਉਦਾਹਰਣ ਦੇ ਕੇ ਸਮਝਾਓ।	CO-2	L2
d.	What do you understand by Samman (respect)? ਸਨਮਾਨ (ਸਤਿਕਾਰ) ਤੋਂ ਤੁਸੀਂ ਕੀ ਸਮਝਦੇ ਹੋ? ਸਮਮਾਨ (ਅਦਰ) ਸੇ ਆਪਕਾ ਕਯਾ ਆਧਰਧ ਹੈ?	CO-3	L1
e.	State the importance of integrity in human value. ਮਾਨਵੀਧ ਮੂਲਧਾਂ ਮੈਂ ਸਧਾਨਿਯਾ ਕੇ ਸਹਲ ਕੋ बताइए। ਮਨੁੱਖੀ ਮੁੱਲ ਵਿੱਚ ਇਮਾਨਦਾਰੀ ਦੀ ਮਹੱਤਤਾ ਦੱਸੋ।	CO-1	L2
f.	Interpret a simple example of leadership. ਸਧਾਨਿਯਾ ਕੇ ਸਹਲ ਕੀ ਕਯਾਯਾ ਕੀਯਾ। ਲੀਡਰਸ਼ਿਪ ਦੀ ਇੱਕ ਸਪਾਰਨ ਉਦਾਹਰਣ ਦੀ ਵਿਆਖਿਆ ਕਰੋ।	CO-4	L1
g.	Differentiate between two types of inclusion. ਸਮਾਵਸ਼ਨ ਕੇ ਦੋ ਪ੍ਰਕਾਰਾਂ ਮੈਂ ਅੰਤਰ बताइए। ਦੇ ਕਿਸਮਾਂ ਦੇ ਸਮਾਵੇਸ਼ ਵਿੱਚ ਅੰਤਰ ਦੱਸੋ।	CO-4	L2
h.	Classify Sah-asthita in your own words. ਸਹ-ਅਸ਼ਤਿਥ ਕੋ ਅਪਨੇ ਖਾਫ਼ੀ ਮੈਂ ਕਾਯਕ੍ਰਿਤ ਕੀਯਾ। ਆਪਣੇ ਸਬਦਾਂ ਵਿੱਚ ਸਹ-ਅਸਤਿਤਵ ਦਾ ਵਰਗੀਕਰਨ ਕਰੋ।	CO-3	L2
i.	Summarize the role of ethical consumption in the workplace. ਕਾਰਧਲ ਮੈਂ ਨੈਤਿਕ ਰੁਪਮੋਧ ਕੀ ਮੁਸਿਕਾ ਕਾ ਸਾਰਾਂਸ਼ ਫੀਯਾ। ਕਾਰਧ ਸਥਾਨ ਵਿੱਚ ਨੈਤਿਕ ਖਪਤ ਦੀ ਭੂਮਿਕਾ ਦਾ ਸਾਰਾਂਸ਼ ਦਿਓ।	CO-4	L2

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J.	Name any two activities of the 'I'.	CO-2	L1
	ਸ੍ਰੀ: ਕੀ ਕਿ-ਵੀ ਦੋ ਗਤਿਵਿਧੀਆਂ ਦੇ ਨਾਮ ਬਤਾਓ। ਸ੍ਰੀ: ਦੀਆਂ ਕਿਸੇ ਵੀ ਦੋ ਗਤਿਵਿਧੀਆਂ ਦੇ ਨਾਮ ਦੱਸੋ।		
	SECTION-B		
2.	Explain whether physical facilities alone can ensure happiness. ਧਰੁ ਸਪਸ਼ਟ ਕੀਯਾ ਕਿ ਕਧਾ ਕੇਵਲ ਭੌਤਿਕ ਸੁਵਿਧਾਏਂ ਹੀ ਸੁਖ ਸੁਨਿਭਿਤ ਕਰ ਸਕਦੀ ਹੈ। ਦੱਸੋ ਕਿ ਕੀ ਸਿਰਫ਼ ਭੌਤਿਕ ਸਹੂਲਤਾਂ ਹੀ ਖੁਸ਼ੀ ਯਕੀਨੀ ਬਣਾ ਸਕਦੀਆਂ ਹਨ।	CO-2	L5
3.	Utilize detailed points the significance of honesty in modern society. ਆਧੁਨਿਕ ਸਮਾਜ ਮੇਂ ਇਮਾਨਦਾਰੀ ਕੇ ਸਹਲ ਕੀ ਵਿਸ਼ਲੇਸ਼ਣਾ ਕਰੋ। ਆਧੁਨਿਕ ਸਮਾਜ ਵਿੱਚ ਇਮਾਨਦਾਰੀ ਦੀ ਮਹੱਤਤਾ ਬਾਰੇ ਵਿਸਤ੍ਰਿਤ ਨੁਕਤਿਆਂ ਦੀ ਵਰਤੋਂ ਕਰੋ।	CO-1	L3
4.	Analyze how the imbalance between 'I' and 'Body' can cause unhappiness. ਵਿਸ਼ਲੇਸ਼ਣ ਕੀਯਾ ਕਿ 'ਮੈਂ' ਔਰ 'ਬਾਦੀ' ਕੇ ਬੀਚ ਅਸੰਤੁਲਨ ਕੈਸੇ ਟੁਕਾ ਕਾਰਣ ਬਨ ਸਕਤਾ ਹੈ। ਵਿਸ਼ਲੇਸ਼ਣ ਕਰੋ ਕਿ 'ਮੈਂ' ਅਤੇ ਸਰੀਰ ਵਿਚਕਾਰ ਅਸੰਤੁਲਨ ਕਿਵੇਂ ਦੁਖੀ ਹੋ ਸਕਦਾ ਹੈ।	CO-2	L4
5.	Identify what happen in relationship when there is a lack of trust. ਰਿਸ਼ਤੇ ਮੇਂ ਵਿਸ਼ਵਾਸ ਕੀ ਕਮੀ ਹੋਨੇ ਪਰ ਕਧਾ ਹੋਗਾ ਹੈ, ਇਸੇ ਪਹਿਚਾਨੀ। ਜਦੋਂ ਰਿਸ਼ਤੇ ਵਿੱਚ ਵਿਸ਼ਵਾਸ ਦੀ ਕਮੀ ਹੁੰਦੀ ਹੈ ਤਾਂ ਕੀ ਹੁੰਦਾ ਹੈ, ਇਸ ਬਾਰੇ ਜਾਣੋ।	CO-3	L3
6.	Interpret the impact of social responsibility on ethical behavior. ਸੋਸ਼ਲਿਕ ਯਕਰਾਰ ਪਰ ਸਾਮਾਜਿਕ ਉਤਰਦਾਇਕਤਾ ਕੇ ਪ੍ਰਭਾਵ ਕਾ ਸੰਘਾਤਨ ਕੀਯਾ। ਨੈਤਿਕ ਵਿਵਹਾਰ 'ਤੇ ਸਾਮਾਜਿਕ ਜ਼ਿੰਮੇਵਾਰੀ ਦੇ ਪ੍ਰਭਾਵ ਦਾ ਮੁਲਾਂਕਣ ਕਰੋ। Plant, Animal, Water, Air and Soil contributor to maintaining overall harmony. ਪ੍ਰਕ੍ਰਿਤੀ ਦੇ ਚਾਰ ਤਰ੍ਹਾਂ - ਪੌਦੇ, ਜੀਵ, ਜਲ, ਵਾਯੂ ਔਰ ਮਿਟੀ - ਕਾ ਯੋਗਦਾਨ ਕਰੋ, ਜੋ ਸਮੁੱਚੇ ਸਾਮਾਜਿਕਤਾ ਬਣਾਏ ਰਖਣੇ ਮੇਂ ਯੋਗਦਾਨ ਕਰਦੇ ਹੈ। ਖੁਸ਼ਦ ਦੇ ਚਾਰ ਤੱਤਾਂ ਦਾ ਵਰਗੀਕਰਨ ਕਰੋ - ਪੌਦਾ, ਜਾਨਵਰ, ਪਾਣੀ, ਹਵਾ ਅਤੇ ਮਿੱਟੀ ਜੋ ਸਮੁੱਚੀ ਸਦਭਾਵਨਾ ਬਣਾਈ ਰੱਖਣ ਵਿੱਚ ਯੋਗਦਾਨ ਪਾਉਂਦੇ ਹਨ। ਹੈ।	CO-4	L5
7.	Classify four element of nature - Plant, Animal, Water, Air and Soil contributor to maintaining overall harmony. ਪ੍ਰਕ੍ਰਿਤੀ ਦੇ ਚਾਰ ਤਰ੍ਹਾਂ - ਪੌਦੇ, ਜੀਵ, ਜਲ, ਵਾਯੂ ਔਰ ਮਿਟੀ - ਕਾ ਯੋਗਦਾਨ ਕਰੋ, ਜੋ ਸਮੁੱਚੇ ਸਾਮਾਜਿਕਤਾ ਬਣਾਏ ਰਖਣੇ ਮੇਂ ਯੋਗਦਾਨ ਕਰਦੇ ਹੈ। ਖੁਸ਼ਦ ਦੇ ਚਾਰ ਤੱਤਾਂ ਦਾ ਵਰਗੀਕਰਨ ਕਰੋ - ਪੌਦਾ, ਜਾਨਵਰ, ਪਾਣੀ, ਹਵਾ ਅਤੇ ਮਿੱਟੀ ਜੋ ਸਮੁੱਚੀ ਸਦਭਾਵਨਾ ਬਣਾਈ ਰੱਖਣ ਵਿੱਚ ਯੋਗਦਾਨ ਪਾਉਂਦੇ ਹਨ। ਹੈ।	CO-4	L4

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11M-96529

Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (All Branches), Semester-Ist/2nd

SUBJECT NAME: ENGINEERING GRAPHICS & DESIGN

Subject Code: BTME101/21

M.Code: 93799/91335

Date of Examination: 18.05.2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying two marks each.
2. SECTION-B & C have **FOUR** questions each.
3. Each question of SECTION B & C consists of eight marks.
4. Attempt any **FIVE** questions from SECTION B & C, taking at least two questions from each section.

1. Answer briefly:

SECTION - A

- a) Explain any two lines used in Engineering Drawing.
- b) What are isometric lines and non-isometric lines?
- c) How will you represent Glass and Wood on a drawing sheet?
- d) Write the following statement with single stroke capital vertical letters of height 12 mm size: **"THE ENGINEER'S MIND IS A MIX OF PRECISION AND CREATIVITY"**.
- e) Explain the importance of title block.
- f) What is the difference between first angle and third angle projection?
- g) Which angle projection is recommended by B.I.S now days?
- h) Explain the methods of placements of Dimensions with a suitable freehand drawing
- i) Show by the means of trace, a plane perpendicular to HP and inclined to VP.
- j) Explain with the help of an example unidirectional system of dimensioning.
- k) Differentiate between prism and pyramid.

SECTION - B

2. A point "N" is 68 mm behind VP and 79 mm below HP. Draw its projections and find out its shortest distance from the reference line.
3. A line AB of 70 mm long, has its end A, 20 mm above HP and 15 mm in front of VP. The line is inclined at 30° to HP and 60° to the VP. Draw its projection.
4. A line AB has its end A 15 mm above the HP and 20 mm in front of VP. End B is 30 mm above the HP and 50 mm in front of the VP. The distance between the end projectors is 45 mm. Draw the projection of line and determine its TL , Θ , ϕ , HT & VT using rotation method. Also determine its traces.
5. A room of 1000 m^3 volume is shown by a cube of 5 cm side. Find its R.F and draw a plain scale to measure upto 30 meters. Also show a distance of 24 meters on it.

SECTION - C

6. A pentagonal prism having a base with a 30 mm side and 60 mm long axis, is resting on one of its rectangular faces on the HP with axis parallel to HP and VP. Draw its projection.
7. A right circular cylinder, diameter of base 50 mm and height 65 mm rests on HP on its base rim such that its axis is inclined at 45° to the HP and parallel to the VP. Draw its projection.
8. A pentagonal prism is placed on the square slab 60 mm and 20 mm height. The side of prism is 25 mm and height 50 mm. Draw its isometric projections.
9. Draw isometric drawing of the hexagonal prism of base edge 25 mm and axis 62 long.

1|M - 93799 / M - 91335

2|M - 93799 / M - 91335

Roll No.

Total No. of Pages: 2

Total No. of Questions: 09

B.Tech (All Branches), (Sem. -1,2)

ENGINEERING PHYSICS

Subject Code: BTPH101-23

M.Code: 93794

Date of Examination: 13-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying two marks each.
2. SECTION-B & C have FOUR questions each.
3. Each question of SECTION B & C consists of eight marks.
4. Attempt any FIVE questions from SECTION B & C, taking at least two questions from each section.

4.	(i) Identify the role of the surface-to-volume ratio in finding the properties of nanomaterials. (ii) Apply the idea of perfect diamagnetism to explain magnetic field exclusion in superconductors.	CO3	L3
5.	Determine the expression for acceptance angle and Numerical aperture. Explain the terms acceptance cone, acceptance angle and numerical aperture along with its physical Significance.	CO6	L5
SECTION-C			
6.	Solve Schrodinger's time-independent wave equation.	CO5	L3
7.	Analyze the effectiveness of different modes of propagation in optical fibres, and inspect how they influence transmission performance.	CO6	L4
8.	Simplify the differential form of Maxwell's 3 rd and 4 th equations.	CO4	L4
9.	Explain the Principle, working of LED, and its I-V characteristics, also write its applications.	CO2	L5

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly: a. List the formula of the relationship between interplanar spacing and cube edge. b. Show the symbolic representation of a Zener diode and a tunnel diode. c. Describe quantum well/two-dimensional nanomaterials. d. Which part of the electromagnetic spectrum has the shortest wavelength and highest frequency? e. Classify the photoelectric effect. f. Which is better, a Ruby or a He-Ne laser? Why? g. Demonstrate the significance of Bragg's law. h. Interpret the graphs for soft and hard superconductors. i. Illustrate the meaning of the gradient of a scalar. j. Define phase and group velocity.	CO1 CO2 CO3 CO4 CO5 CO6 CO1 CO3 CO4 CO5	L1 L2 L2 L1 L2 L1 L2 L2 L2 L1
SECTION-B			
2.	Develop and utilize the expression of Bragg's law to (i) identify the interplanar spacing d (ii) If the second-order diffraction peak is also possible, at what angle will it occur? Given: X-rays of wavelength $1.54 \text{ \AA}$ are incident on a crystal. The first-order Bragg reflection is observed at an angle of 22.5° .	CO1	L3
3.	Simplify how the energy bands are formed in solids and List materials based on band gap: conductor, semiconductor, and insulator.	CO2	L4

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1|M-93794

2|M-93794

B.Tech (ME), (Sem-I,2)
ELECTROMAGNETISM
Subject Code: BTPH103-18
M.Code: 75357

Date of Examination: 13-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying two marks each.
2. SECTION-B & C have FOUR questions each.
3. Each question of SECTION B & C consists of eight marks.
4. Attempt any FIVE questions from SECTION B & C, taking at least two questions from each section.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly.		
a.	Define an electric dipole and dipole moment.	CO1	L1
b.	State Atomic polarizability.	CO1	L2
c.	Summarize Faradays law.	CO2	L2
d.	Define magnetic susceptibility (χ_m).	CO2	L1
e.	Illustrate one example each antiferromagnetic and ferromagnetic materials.	CO2	L2
f.	What is Lenz's law?	CO3	L1
g.	Interpret the mathematical form of the continuity equation.	CO3	L2
h.	State Poynting vector.	CO3	L1
i.	Define polarization of an electromagnetic wave.	CO4	L1
j.	"Electromagnetic waves are called transverse waves". Explain.	CO4	L2
SECTION-B			
2.	Derive and discuss the boundary conditions for electrostatic field.	CO1	L3
3.	Examine the physical significance of the divergence and curl of a magnetic field, and derive their mathematical expressions.	CO2	L4
4.	Evaluate how the Poynting theorem expresses the flow and conservation of electromagnetic energy in space, and justify its role in describing energy transfer through electromagnetic fields.	CO3	L5
5.	Analyze how linear, circular, and elliptical polarizations are produced by superposition of two orthogonal electric field components.	CO4	L4

1|M-75357



SECTION-C			
6.	Evaluate the energy stored in a system of polarized dielectrics in terms of E, D, and P.	CO1	L5
7.	Compare the magnetic properties of diamagnetic and paramagnetic materials on the basis of their atomic structure, susceptibility, and behavior in external magnetic fields.	CO2	L4
8.	Utilize the differential form of Faraday's law, calculate the induced electric field in a circular loop when the magnetic flux through it changes with time.	CO3	L3
9.	Distinguish between linear, circular, and elliptical polarization of electromagnetic waves.	CO4	L4

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2|M-75357

B.Tech Sem-1

Roll No.

Total No. of Questions: 09

Total No. of Pages: 02

B.Tech (AIDS, AIML, CSE, CS, CSE DS, IoT, ECE, IT, ME, RAD), (Sem-1st)
ENGINEERING MATHEMATICS - I

Subject Code: 25CIEMU-101

M.Code: 96566 / 96574 / 96720 / 96582 / 96590 / 96652 / 96598 / 96606 / 96615 / 96623

Date of Examination: 21-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-B			
2.	Examine the convergence or divergence of the series: $\sum \left(\sqrt[n]{n^3 + 1} - n \right)$.	CO-1	L4
3.	Solve for the surface area of the solid generated by revolving the curve $r = a(1 + \cos \theta)$ about the initial line.	CO-2	L3
4.	If $\theta = t^n e^{at}$, determine the value of n which will make $\frac{1}{r^2} \frac{\partial}{\partial r} \left(r^2 \frac{\partial \theta}{\partial r} \right) = \frac{\partial \theta}{\partial t}$.	CO-3	L5
5.	Simplify the integral $\int_0^{1-x} xy \, dy \, dx$ by changing the order of integration.	CO-4	L4
6.	A rectangular box, open at the top, is to have volume of 32 cubic meters. Determine the dimension of the box requiring least material for its construction.	CO-3	L5
SECTION-C			
7.	Apply the arc-length formula to obtain the length of an arc of the cycloid whose equations are given by $x = a(\theta + \sin \theta)$ and $y = a(1 - \cos \theta)$.	CO-2	L3
8.	Simplify $x^2 \frac{\partial^2 u}{\partial x^2} + 2xy \frac{\partial^2 u}{\partial x \partial y} + y^2 \frac{\partial^2 u}{\partial y^2}$, where $u = \sin^{-1} \left(\frac{x+y}{\sqrt{x^2+y^2}} \right)$.	CO-3	L4
9.	Determine the volume of the sphere $x^2 + y^2 + z^2 = 9$.	CO-4	L5

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Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define Cauchy's integral test.	CO-1	L1
b.	Explain convergent series with an example.	CO-1	L2
c.	Discuss monotonic sequence with an example.	CO-1	L2
d.	What is the expression for finding the volume of the solid generated by revolution about the x-axis, of the area bounded by the curve $y = f(x)$, the x-axis and the ordinates $x = a, x = b$?	CO-2	L1
e.	Classify the integral $\int_{-\infty}^0 e^{4x} dx$ as convergent or divergent.	CO-2	L2
f.	Show that $\beta(m, n) = \beta(n, m)$.	CO-2	L2
g.	If $z = \log(x^2 + xy + y^2)$, then find $x \frac{\partial z}{\partial x} + y \frac{\partial z}{\partial y}$.	CO-3	L1
h.	If $u = e^{x^2+y^2}$, then show that $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = 2u \log u$.	CO-3	L2
i.	Find the value of the integral: $\int_0^a \int_0^a (yz + zx + xy) dx \, dy \, dz$.	CO-4	L1
j.	Obtain the value of: $\int_0^1 \int_0^1 (x^2 + y^2) dx \, dy$.	CO-4	L2

I | M- 96566 / 96574 / 96720 / 96582 / 96590 / 96652 / 96598 / 96606 / 96615 / 96623

2 | M- 96566 / 96574 / 96720 / 96582 / 96590 / 96652 / 96598 / 96606 / 96615 / 96623

Total No. of Questions: 09

B.Tech (CSE/IT/AI DS/AI ML), Sem-1,

MATHMATICS-I

Subject Code: BTAM104-18

M.Code: 75362

Date of Examination: 21-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying two marks each.
2. SECTION-B & C have FOUR questions each.
3. Each question of SECTION B & C consists of eight marks.
4. Attempt any FIVE questions from SECTION B & C, taking at least two questions from each section.

Q. No.	Question	Course Outcome	Bloom's Level
	SECTION-A		
1.	Answer briefly:		
a.	Outline the independence of vectors (3,2,4), (1,0,2) and (1,-1,1)	CO4	L2
b.	Define Rank Nullity Theorem.		
c.	$\begin{bmatrix} 4 & 2 & 1 \\ 6 & 3 & 4 \\ 2 & 1 & 0 \end{bmatrix}$ is orthogonal?	CO5 CO4	L1 L2
d.	Show that the set $S = \{(x,y,z) : x=3y\}$ forms a subspace of the vector space of all the ordered triplets.	CO5	L2
e.	Obtain first three terms of Taylor's series of $\cos x$ about $x = \frac{\pi}{4}$	CO1	L2
f.	State Cauchy's mean value theorem	CO1	L2
g.	Find the rank of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 7 \\ 3 & 6 & 10 \end{bmatrix}$	CO3	L1
h.	Obtain the value of x for which the matrix $\begin{bmatrix} 2+x & 3 & 4 \\ 1 & -1 & 2 \\ x & 1 & -5 \end{bmatrix}$ is non-singular and what will be the rank?	CO3	L2
i.	What is the value of $\lim_{x \rightarrow \infty} \frac{x^2 - ax^2}{x - a}$?	CO2	L1

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Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (CSE/AIML/AIDS/IOT/CSE DS/CS/RAI), Semester 3rd

DATA STRUCTURE & ALGORITHMS

Subject Code: BTCS-301-18

M.Code: 76436

Date of Examination: 20-05-2025

Time: 3 Hrs.

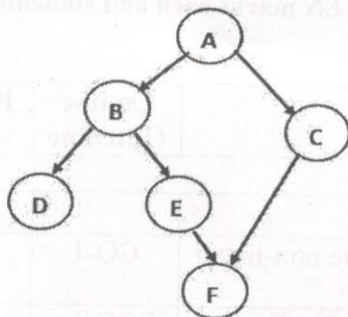
Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define Data Structure and name one linear and one non-linear data structure.	CO-1	L1
b.	Demonstrate Circular linked list with the help of a diagram storing values 5, 10, 15, 20, 25.	CO-1	L2
c.	Which asymptotic notation represents the upper bound of an algorithm?	CO-2	L1
d.	Contrast and compare between time complexity and space complexity.	CO-2	L2
e.	What is traversal in data structures?	CO-3	L1
f.	Differentiate between B-Tree and B+ Tree.(any two).	CO-3	L2
g.	Define the working principle of binary search with example.	CO-4	L1
h.	Explain one method used to resolve collisions in hashing with a simple example.	CO-4	L2
i.	What is a directed and undirected graph? Give an example.	CO-5	L1
j.	Explain the four applications of Depth-First Search (DFS) in different domains.	CO-5	L2
SECTION-B			
2.	Identify how Linear Search and Binary Search works, and analyze their efficiency in different scenarios.	CO-1	L3
3.	Develop an algorithm to insert an element into a stack in which the stack is implemented as linked list and explain all steps.	CO-2	L3
4.	Explain how the circular queue is different from linear queue. Construct an algorithm for insertion and deletion operations of circular queue.	CO-3	L5
5.	Solve the following array using Heap Sort with step by step diagram and algorithm. 12, 11, 13, 5, 6, 7, 15, 3, 9	CO-4	L4

6.	Explain Graph data structure with its types and discuss its advantages, disadvantages, and applications.	CO-5	L5
SECTION-C			
7.	Solve the following: - (i) $F(n) = 6993$ (for upper bound) (ii) $F(n) = 1001n^2 + 100n + 10$ ((for lower bound) (iii) $F(n) = 2n^3 + 4n + 5$ (for upper bound) (iv) $F(n) = 6 \cdot 2^n + n^2 = \Theta(2^n)$ (for tight bound)	CO-1	L4
8.	Develop and explain an algorithm to insert a new node at the correct sorted position in the given singly linked list: 101 $\rightarrow$ 104 $\rightarrow$ 110 $\rightarrow$ 115 $\rightarrow$ NULL and insert ITEM-108	CO-3	L3
9.	Determine the step by step DFS traversal of the following graph starting from vertex A with algorithm and also give any 2 applications of DFS.	CO-4	L5



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6.	Interpret the role of multiple catch blocks in handling exceptions of different types. Provide an example to support your analysis.	CO-5	L5
SECTION-C			
7.	Interpret the necessity of parameterized constructors over default constructors in C++ object initialization. Support your judgment with a suitable example program and justify the situations where parameterized constructors are more effective.	CO-2	L5
8.	Analyze how hierarchical inheritance can be applied to a University portal where Person is a base class and derived classes are Student, Faculty, and Admin.	CO-3	L4
9.	Explain the significance of virtual function inheritance in C++, how virtual functions are inherited and overridden across multiple levels of class hierarchy using a suitable example. Give the output of the program also.	CO-4	L5

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Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (IT/CSE/AI ML/AIDS/IOT/CSE DS/CS/RAI), Semester 3rd

MATHEMATICS-III

Subject Code: BTAM302-23

M.Code: 94630

Date of Examination: 2-9-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	Course Outcome	Bloom's Level														
SECTION-A																	
1.	Answer briefly:																
a.	What do you mean by Skewness?	CO-1	L1														
b.	Find the median of the following dataset: 32, 6, 21, 10,8,11, 12, 36, 17, 16,15, 18, 30, 35, 32, 18, 39, 12, 20	CO-1	L2														
c.	If a leap year is selected at random, what is the chance that it will contain 53 Fridays?	CO-2	L1														
d.	A die is thrown at random. Find the probability that the number on it is greater than four.	CO-2	L2														
e.	Illustrate any two properties of Normal Distribution.	CO-3	L1														
f.	The sum of mean and variance of a binomial distribution is 35/16 for 5 trials. Find the distribution.	CO-3	L2														
g.	Distinguish between correlation and regression.	CO-4	L1														
h.	If $n= 12$ and $\sum D^2 = 260$ what is the coefficient of rank correlation?	CO-4	L2														
i.	State any two applications of F-test.	CO-5	L1														
j.	Explain the procedure for testing a hypothesis.	CO-5	L2														
SECTION-B																	
2.	Calculate Karl Pearson's coefficient of skewness from the following data <table><tr><td>Wages (Rs)</td><td>0-5</td><td>5-10</td><td>10-15</td><td>15-20</td><td>20-25</td><td>25-30</td></tr><tr><td>No. of workers</td><td>10</td><td>15</td><td>30</td><td>18</td><td>10</td><td>5</td></tr></table>	Wages (Rs)	0-5	5-10	10-15	15-20	20-25	25-30	No. of workers	10	15	30	18	10	5	CO-1	L3
Wages (Rs)	0-5	5-10	10-15	15-20	20-25	25-30											
No. of workers	10	15	30	18	10	5											
3.	If $f(x)=\begin{cases} x, & 0 \leq x \leq 1 \\ 2-x, & 1 \leq x \leq 2 \end{cases}$, Evaluate mean and variance of a random variable x.	CO-2	L5														
4.	It is observed that on an average one ship out of 9 was sunk. Determine the probability that out of 6 ships exactly 3 sunk ?	CO-3	L5														



5.	Fit the curve $Y=a+bX^2$ to the following data	CO-4	L4																						
	<table><tr><td>X</td><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td></tr><tr><td>Y</td><td>8</td><td>10</td><td>15</td><td>21</td><td>30</td></tr></table>	X	10	20	30	40	50	Y	8	10	15	21	30												
X	10	20	30	40	50																				
Y	8	10	15	21	30																				
6.	Two random samples from two normal populations are given as: <table><tr><td>Sample A</td><td>16</td><td>26</td><td>27</td><td>23</td><td>24</td><td>22</td></tr><tr><td>Sample B</td><td>33</td><td>42</td><td>35</td><td>32</td><td>28</td><td>31</td></tr></table> Conclude whether the estimates of populations variances differ significantly?	Sample A	16	26	27	23	24	22	Sample B	33	42	35	32	28	31	CO-5	L5								
Sample A	16	26	27	23	24	22																			
Sample B	33	42	35	32	28	31																			
SECTION-C																									
7.	Fit a Poisson distribution to the following data and test for its goodness at 5% level of significance	CO-1	L4																						
	<table><tr><td>X</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>F</td><td>419</td><td>352</td><td>154</td><td>59</td><td>19</td></tr></table>	X	0	1	2	3	4	F	419	352	154	59	19												
X	0	1	2	3	4																				
F	419	352	154	59	19																				
8.	(i) In a distribution, exactly normal, 7% of the items are under 35 and 89% are under 63. What are the mean and standard deviation of the distribution? (ii) Let X denote the number of scores in a test. If X is normally distributed with mean 100 and standard deviation 15. Test for the probability that X does not exceed 130.	CO-3	L4																						
9.	Calculate the coefficient of correlation between X and Y from the following data: <table><tr><td>X</td><td>23</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td><td>33</td><td>35</td><td>36</td><td>39</td></tr><tr><td>Y</td><td>18</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>28</td><td>29</td><td>30</td><td>32</td></tr></table>	X	23	27	28	29	30	31	33	35	36	39	Y	18	22	23	24	25	26	28	29	30	32	CO-4	L3
X	23	27	28	29	30	31	33	35	36	39															
Y	18	22	23	24	25	26	28	29	30	32															

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Total No. of Pages: 01

B.Sc. (Cyber Security/Data Analytics), Semester-3rd

PROGRAMMING IN PYTHON

Subject Code: UGCA1914

M. Code: 92757/92558

Date of Examination: 16-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B consists of SIX questions, each carrying TEN marks each and student has to attempt any FOUR questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Define Python and its two key features.	CO-1	L1
b.	Write the file extension used for Python source files.	CO-2	L1
c.	List the three main types of control structures in Python.	CO-3	L1
d.	Name any two built-in functions in Python.	CO-4	L1
e.	Define the term 'object' in Python.	CO-5	L1
f.	Outline the role of indentation in defining the scope of code blocks in Python.	CO-1	L2
g.	Describe why Python is typically slower than compiled language like C.	CO-2	L2
h.	Differentiate between 'is' and '==' operators with examples.	CO-3	L2
i.	State the concept of 'scope' (e.g., local vs. global) for variables in functions.	CO-4	L2
j.	Explain how object destruction is managed by Python's Garbage Collection.	CO-5	L2
SECTION-B			
2.	Identify the role of input () and print () functions in user interaction with a Python program.	CO-1	L3
3.	Explore the major features and limitations of Python compared to traditional programming languages like C or Java.	CO-2	L4
4.	Validate various control structures used for iteration and decision-making in Python.	CO-3	L5
5.	Write a program to compute the factorial of a any given number.	CO-4	L3
6.	Simplify the process of garbage collection and object destruction in Python with an example.	CO-5	L4
7.	Explain the concept of Package and Module in Python with an example.	CO-4	L5

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1|M-92757/92558

Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (AIDS/AIML/CSE/CSE DS/CS/IOT/IT/RAI), Semester-3rd

DIGITAL ELECTRONICS

Subject Code: BTES 301-18

M.Code:76435

Date of Examination: 16-05-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION-B contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. SECTION C contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Find the division of binary numbers 01001 and 01011.	CO-1	L1
b.	Show the result of $(10111)_2 + (10011)_2$ and verify the result in decimal form also.	CO-1	L2
c.	Recall about the term minterm. Give an example for variables A, B and C.	CO-2	L1
d.	Extend the given function $F(x,y) = \prod M(1,2,3)$ using K Map.	CO-2	L2
e.	Show the block diagram of full adder using two half adders.	CO-3	L1
f.	Outline any two applications of encoder and decoder.	CO-3	L2
g.	Summarize the meaning of synchronous counter.	CO-4	L2
h.	Outline the principle of EPROM erasing.	CO-5	L2
i.	Compare D/A and A/D converter.	CO-6	L2
j.	Recall successive approximation ADC.	CO-6	L1
SECTION-B			
2.	Identify the difference between BCD, Gray code, and Excess-3 code with suitable examples.	CO-1	L3
3.	Simplify the Boolean expression $F = A'B'C + ABC' + AB'C + A'BC + ABC$ using Boolean algebra laws and verify the result with a K-Map.	CO-2	L4
4.	Analyze the working of 8:1 and 4:1 multiplexer with suitable diagram.	CO-3	L4
5.	Identify the types and working of shift register.	CO-4	L3

6.	Apply the concept of resolution and accuracy in ADC/DAC with suitable examples.	CO-6	L3
SECTION-C			
7.	Explain 3-bit synchronous up/down counter using suitable diagram.	CO-4	L5
8.	Discuss and design mod-10 counter in detail.	CO-4	L6
9.	Elaborate the types of programmable logic devices and realize the given function using PLA and PAL: $F1 = \sum m(0, 2, 4, 6)$ and $F1 = \sum m(1, 3, 5, 7)$	CO-5	L6

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Roll No.

Total No. of Pages: 01

Total No. of Questions: 07

B.Sc (AIML), Semester-3rd

Internet Tools and Applications

Subject Code: UGCA1959

M.Code: 90355

Date of Examination: 14-05-2025

Time: 3 Hrs.

Max. Marks:60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Name one advantage and one disadvantage of the Internet.	CO-1	L1
b.	Explain how DNS helps translate names to addresses.	CO-1	L2
c.	Define Internet Protocol (IP).	CO-2	L1
d.	Outline any 2 benefits FTP offer to users.	CO-2	L2
e.	What is the difference between "To" and "BCC" fields in email?	CO-3	L1
f.	Illustrate why is the user agent important in the email architecture?	CO-3	L2
g.	Name different servers help in working of DNS.	CO-4	L1
h.	Outline a basic function of DNS in Internet communication.	CO-4	L2
i.	What is meant by "client-server model" in WWW?	CO-5	L1
j.	Explain the structure of a basic hyperlink in HTML.	CO-5	L2
SECTION-B			
2.	Apply the concept of remote login to describe how to manage distant servers effectively.	CO-1	L3
3.	Analyze the advantages and disadvantages of using FTP for data transfer compared to modern cloud-based methods.	CO-2	L4
4.	Explain the role of Internet applications in digital communication—such as messaging, blogs, and social media.	CO-3	L5
5.	Assess the importance of using proper URL schemes for security and functionality on websites.	CO-4	L5
6.	Apply your understanding of lists in HTML to organize data efficiently. Give example.	CO-5	L3
7.	Examine CSS within a <style> tag to modify the appearance of a web page created using HTML, with example.	CO-5	L4

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Roll No.

Total No. of Pages: 1

Total No. of Questions: 07

B.Sc. CS, Semester-3rd

ETHICAL HACKING

Subject Code: UGCA1988

M.Code: 92753

Date of Examination: 14-05-2026

Time: 3 Hrs.

Max. Marks:60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION-B consists of **SIX** questions; carrying **TEN** marks each and student have to attempt any **FOUR** questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	What is the purpose of Exploit in Ethical Hacking?	CO-1	L1
b.	Explain the role of security in Ethical Hacking.	CO-1	L2
c.	Classify the purpose of TOE (Target of Evaluation) with the help of real world examples.	CO-1	L2
d.	What is the use of WHOIS lookup?	CO-2	L1
e.	Compare the role of active fingerprinting and passive fingerprinting.	CO-2	L2
f.	Explain the methodology of the Hackers.	CO-2	L2
g.	Names any two tools used for DNS enumeration.	CO-3	L1
h.	Differentiate the role of ICMP scan and FIN scan in ethical hacking.	CO-3	L2
i.	How to implement the process of keystroke logger (keylogger)?	CO-4	L1
j.	Define the term of wireless network sniffing.	CO-4	L1
SECTION-B			
2.	Use the concepts of DNS with its types that used in ethical hacking.	CO1	L3
3.	Identify the role of TCP with any three common TCP ports that provide the service in ethical hacking.	CO1	L3
4.	Classify various types of Hackers, Why should organizations hire ethical hackers?	CO2	L4
5.	Analyze the concept of passive and active footprinting with two advantages and disadvantages.	CO3	L4
6.	Explain the meaning of information gathering in ethical hacking and IP WHOIS in Footprinting.	CO3	L5
7.	Determine the relationships between key management, authentication, and encryption in establishing secure wireless communication	CO4	L5

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Total No. of Pages: 01

Total No. of Questions: 07

B.Sc. CS, Semester-3rd

MATHEMATICAL FOUNDATIONS FOR CRYPTOGRAPHY

Subject Code: UGCA1987

M.Code: 92751

Date of Examination: 08-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	State Fermat's Little Theorem.	CO-1	L1
b.	Explain Linear congruence with an example.	CO-1	L2
c.	Find the gcd of 168 and 180.	CO-1	L1
d.	Define a group with an example.	CO-2	L1
e.	Explain the concept of the field.	CO-2	L2
f.	Construct the composition table for Z_5 under addition.	CO-2	L3
g.	Interpret 25 and 15 in binary form.	CO-3	L1
h.	What does bitwise OR do?	CO-3	L1
i.	Define cryptanalysis with its purpose.	CO-4	L1
j.	Outline privacy in the context of information security.	CO-4	L2
SECTION-B			
2.	Examine all solutions to the system of congruences (using CRT): $x \equiv 2 \pmod{3}$, $x \equiv 3 \pmod{5}$, $x \equiv 2 \pmod{7}$.	CO1	L4
3.	Give an example of a ring and explain the steps that how it forms a ring.	CO2	L5
4.	Explain the concept of binary arithmetic operation. Perform binary addition and subtraction for $(1101)_2$ and $(1011)_2$.	CO3	L5
5.	Given $A = 45$, $B = 27$, $C = 12$. Simplify $R = (A B) - (B \& C)$.	CO3	L4
6.	(a) Analyse the concept of cryptography to demonstrate how it is used in real-life daily applications. (b) Examine the necessity of combining symmetric and asymmetric encryption in secure communication systems, and differentiate their roles in enhancing overall security.	CO4	L4
7.	Explain the role of keys, ciphers, and cryptanalysis in maintaining confidentiality and privacy.	CO4	L5

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Total No. of Pages: 1

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B.Sc-DA, Semester-3rd

Data Warehouse and Mining

Subject Code: UGCA1931

M.Code: 92553

Date of Examination: 08-05-2026

Time: 3 Hrs.

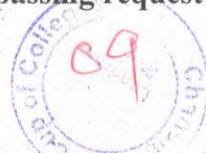
Max. Marks:60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B consists of SIX questions, each carrying TEN marks each and the student has to attempt any FOUR questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Explain strategic information is important in an organization.	CO1	L2
b.	Differentiate between operational data stores and informational data stores.	CO1	L2
c.	Describe data pre-processing and its need.	CO2	L2
d.	Illustrate the concept of data mining.	CO3	L2
e.	What is a multidimensional data model?	CO2	L1
f.	Mention any two clustering methods.	CO4	L1
g.	Define a decision tree in data mining.	CO4	L1
h.	Name two classification techniques.	CO4	L1
i.	Explain the concept of Apriori algorithm briefly.	CO3	L2
j.	What do you understand about association rule mining?	CO3	L1
SECTION-B			
2.	Analyze various clustering methods and their applications in data analysis.	CO4	L4
3.	Construct different OLAP operations with suitable examples.	CO2	L5
4.	Analyze the complete data mining process and its significance in real-world applications.	CO3	L4
5.	Compare operational and informational data stores with respect to their role in decision-making.	CO1	L4
6.	Identify multidimensional schemas such as Star, Snowflake, and Fact Constellation schema.	CO2	L3
7.	Evaluate the challenges in data mining and propose suitable solutions to address them.	CO3	L5

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Total No. of Pages:01

B.Sc. (AIML), Semester-3rd
DESIGN AND ANALYSIS OF ALGORITHMS

M.Code:90350

Time: 3 Hrs.

Max. Marks:60

3. **SECTION-A is COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
4. **SECTION-B** consists of **SIX** questions, carrying **TEN** marks each and students have to attempt any **FOUR** questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Write one example each for linear and logarithmic time algorithms.	CO-1	L1
b.	State the various characteristics of an algorithm.	CO-1	L2
c.	Differentiate between Time and Space complexity of an algorithm.	CO-1	L2
d.	What is backtracking?	CO-2	L1
e.	Illustrate the concept of N-Queens problem.	CO-2	L2
f.	Interpret how dynamic programming guarantees optimal solutions.	CO-2	L2
g.	Define Depth First Search (DFS).	CO-3	L1
h.	Explain the concept of residual graphs in network flow.	CO-3	L2
i.	Write two examples of a tractable problem.	CO-4	L1
j.	State the role of polynomial-time reduction.	CO-4	L2
SECTION-B			
2.	Compute the average-case complexity of sequential search in an array of n elements.	CO1	L3
3.	Evaluate the number of bins required using First-Fit Decreasing and Best-Fit Decreasing algorithms for the items [8, 5, 6, 2, 4, 7] with bin capacity 12. Arrange the items in decreasing order, show step-by-step bin allocation for both methods, compare the results, and justify which algorithm performs better.	CO2	L5
4.	Construct the shortest path algorithms with their types, working steps, and suitable examples.	CO3	L3
5.	Examine the relationship between NP, NP-complete, and NP-hard problems with suitable reasoning.	CO4	L4
6.	Differentiate the performance of Prim's and Kruskal's algorithms for dense and sparse graphs.	CO3	L4
7.	Apply randomized techniques to solve a problem and compare it with a deterministic solution.	CO4	L5

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Total No. of Pages:02

Total No. of Questions: 09

B.Tech (CSE/AIML/AIDS/CSE IOT/CSE DS/CSE CS/RAI), Semester 3rd

DEVELOPMENT OF SOCIETIES

Subject Code: HSMC-101-18

M.Code:76349

Date of Examination: 07-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	List one key difference between a family and a kinship group.	CO-1	L1
b.	Compare the role of the patriarchal family in ancient and modern times.	CO-1	L2
c.	What do you understand by the industrial social system?	CO-2	L1
d.	Describe how a feudal social system functioned in medieval Europe.	CO-2	L2
e.	How does technological advancement influence the evolution of social structures?	CO-3	L1
f.	Distinguish between a dictatorship and an oligarchy.	CO-3	L2
g.	List different periods of capitalism.	CO-4	L1
h.	Compare how power is distributed in a federal system and in a unitary system.	CO-4	L2
i.	Which economic system advocates private ownership of means of production?	CO-5	L1
j.	Outline the ideas of development "Small is beautiful" proposed by E. F. Schumacher's.	CO-5	L2
SECTION-B			
2.	Examine the causes of generational conflict in modern families.	CO-1	L4
3.	Compare National Political system with subnational political system.	CO-2	L4

4.	Determine the main outcomes of the 1990s disinvestment and liberalization policy.	CO-4	L5
5.	Apply the principles of Buddhist economics to modern-day challenges like climate change and unemployment.	CO-3	L3
6.	Analyze how the Jajmani system provided both economic security and social stability, but at the same time limited progress in pre-British India.	CO-5	L4
SECTION-C			
7.	Analyze how the biological needs of human beings contributed to the formation of families.	CO-2	L4
8.	Examine the concept of "role strain" to working women in urban India and discuss implications for social structure.	CO-3	L4
9.	Explain the role of cottage industries and agriculture in making India the "Golden Bird" before British rule. Examine the factors that made these industries vulnerable to colonial exploitation.	CO-5	L5

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Roll No.

Total No. of Pages: 01

Total No. of Questions: 07

B.Sc. (CYBER SECURITY), Semester-3rd

COMPUTER NETWORKS

Subject Code: UGCA 1913

M.Code: 92750

Date of Examination: 05-05-2026

Time: 3 Hrs.

Max. Marks:60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define analog transmission.	CO1	L1
b.	Explain why packet switching is efficient for data networks.	CO1	L2
c.	Define PPP (Point-to-Point Protocol).	CO2	L1
d.	Explain the concept of time-division multiplexing (TDM).	CO2	L2
e.	Define message switching.	CO3	L1
f.	Explain the Hybrid topology and its advantages.	CO3	L2
g.	List the types of routing algorithms.	CO4	L1
h.	Explain how internetworking devices enable communication between networks.	CO4	L2
i.	What is the Application Layer?	CO5	L1
j.	Explain the role of DNS in mapping domain names to IP addresses?	CO5	L2
SECTION-B			
2.	Apply network topologies (bus, star, ring) to a small office scenario and explain which is most suitable.	CO1	L3
3.	Simplify the concept of layered architecture to explain how communication happens between two computers using the OSI model.	CO2	L4
4.	Evaluate whether TCP or UDP is better suited for time-sensitive data applications.	CO4	L5
5.	Compare telephone lines, coaxial cables, and optical fibre for network reliability and efficiency.	CO3	L5
6.	Apply addressing in the transport layer to show how multiple processes communicate simultaneously.	CO4	L3
7.	Analyze the role of DNS caching in reducing web page loading times.	CO5	L4

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Roll No.

Total No. of Pages: 01

Total No. of Questions: 07

B.Sc. (AIML), Semester- 3rd
ARTIFICIAL INTELLIGENCE

Subject Code: UGCA1973

M.Code: 90349

Date of Examination: 05-05-2025

Time: 3 Hrs.

Max. Marks:60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Discuss the major challenges faced by AI systems in achieving human-like intelligence.	CO1	L1
b.	Explain the importance of learning in AI agents.	CO2	L2
c.	Define Minimax search.	CO3	L1
d.	Outline the advantages of bidirectional search.	CO3	L2
e.	Define local vs global search.	CO4	L1
f.	Illustrate problem reduction in search algorithms.	CO4	L2
g.	Define sequential decision problems.	CO5	L1
h.	Mention basic syntax of PROLOG.	CO6	L2
i.	What is Forward chaining in an expert system?	CO6	L1
j.	Outline the applications of knowledge representation.	CO5	L2
SECTION-B			
2.	Identify the main areas where AI is used today. Give simple examples from our day to day life.	CO1	L3
3.	Write a short note on: a) Utility-driven agent b) Learning agent.	CO2	L4
4.	Explain the role of evaluation and heuristic functions in search.	CO3	L5
5.	Explain the A* search algorithm with a step-by-step example.	CO4	L5
6.	Identify knowledge representation in the field of AI with various types of knowledge.	CO5	L3
7.	Classify the architecture of expert systems with its components and existing expert systems.	CO6	L4

NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the student.

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Total No. of Pages: 01

Total No. of Questions: 07

B.Sc.(Data Analytics), Semester-3rd

OPERATING SYSTEM

Subject Code: UGCA1923

M.Code: 92552

Date of Examination:05-05-2026

Time: 3 Hrs.

Max. Marks:60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Define the long-term and short-term schedulers in an operating system	CO-1	L1
b.	Differentiate between Command-Line Interface (CLI) and Graphical User Interface (GUI) based on their features.	CO-1	L2
c.	Outline the concept of multitasking with suitable examples from daily life.	CO-1	L2
d.	What are the different types of threads available in operating system?	CO-2	L1
e.	Explain the basic concept of Shortest Job First (SJF) scheduling.	CO-2	L2
f.	Illustrate turnaround time and waiting time are related in a CPU scheduling process.	CO-2	L2
g.	Write the basic difference between paging and segmentation.	CO-3	L1
h.	Illustrate the concept of virtual memory.	CO-3	L2
i.	Name any two types of disk storage devices used in a computer system.	CO-4	L1
j.	Classify the various directory structures found in operating systems.	CO-4	L2
SECTION-B			
2.	Use various types of operating systems by examining their features, advantages, and disadvantages, and how these aspects affect their performance in different computing environments.	CO-1	L3
3.	Explain the State Transition Diagram with Scheduler and Scheduling Queues.	CO-2	L5
4.	Simplify the user view and system view of an operating system and how both perspectives influence the design and functionality of the system with suitable examples.	CO-1	L3
5.	Assume a system uses Round Robin (RR) CPU scheduling with a time quantum of 4 ms. The following processes arrive at time 0: Process(P1,P2,P3,P4), Burst Time(ms)(10,4,6,8) Using Round Robin scheduling, construct the Gantt chart and calculate: 1.Completion Time(CT) of each process, 2.Turn around Time(TAT),3.Waiting Time (WT), 4.Average Waiting Time	CO-2	L4
6.	Analyze the various types of device drivers with their roles and give examples for each.	CO-3	L4
7.	Evaluate the process of remote file access in distributed systems with a clear step-by-step explanation.	CO-4	L5

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Total No. of Questions: 07

B.Sc. (AIML), Semester-3
DATABASE MANAGEMENT SYSTEM
Subject Code: UGCA1922
M.Code: 90351
Date of Examination: 12-5-2026

Time: 3 Hrs.

Max. Marks:60**INSTRUCTIONS TO CANDIDATES:**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	List the major components of a Database Management System (DBMS).	CO-1	L1
b.	Explain the table and how to create its fields.	CO-1	L2
c.	Define the term Entity with an example.	CO-1	L1
d.	Write about the SQL Commands: - a. Alter b. Drop	CO-2	L1
e.	Define Data Definition Language (DDL) and Data Manipulation Language (DML) in SQL.	CO-2	L1
f.	Describe the Database Trigger.	CO-2	L2
g.	Illustrate the concept of transitive dependency in Third Normal Form (3NF).	CO-3	L2
h.	Compare create and rename commands with syntax and examples.	CO-3	L2
i.	Define the concept of concurrency problems in database systems.	CO-4	L1
j.	Explain the advantages of distributed databases in modern systems.	CO-4	L2
SECTION-B			
2.	Construct the Three-Level Architecture of DBMS with the help of neat diagram.	CO1	L3
3.	Explain the term Normalization and justify 1NF, 2NF, and 3NF with suitable examples.	CO3	L5
4.	Make use of SQL queries to perform Data Definition Language (DDL) operations for creating a "Student" table.	CO2	L3
5.	Differentiate the concept of stored procedures and triggers in database automation.	CO2	L4
6.	Distinguish the concepts of primary key and foreign key, and with the help of STUDENT-DEPARTMENT tables.	CO3	L4
7.	Evaluate distributed databases based on their limitations and performance issues.	CO4	L5

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Roll No.

Total No. of Pages: 01

Total No. of Questions: 07

B. Sc (Data Analytics)/B.Sc. (CYBER SECURITY), Semester-3rd**DATA STRUCTURES**

Subject Code: UGCA 1915

M.Code: 92554/92752

Date of Examination: 12-05-2026

Time: 3 Hrs.

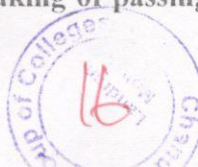
Max. Marks:60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION-B consists of **SIX** questions, carrying **TEN** marks each and student have to attempt any **FOUR** questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define function in any programming language.	CO1	L1
b.	Explain recursion with a suitable example.	CO1	L2
c.	List any two applications of stack.	CO2	L1
d.	Explain input restricted queue with the help of example.	CO2	L2
e.	What is a head pointer in a linked list?	CO3	L1
f.	Compare array and linked list.	CO3	L2
g.	Define merge sort with the help of an example.	CO4	L1
h.	Illustrate the term "collision in hashing".	CO4	L2
i.	What do you mean by flowchart?	CO5	L1
j.	Classify different types of data structures.	CO5	L2
SECTION-B			
2.	Construct C++ program to perform addition of two matrices using two-dimensional arrays.	CO1	L3
3.	Analyse different advantages and disadvantages of array also explain its types.	CO2	L4
4.	Explain string and different library functions of string with the help of an example.	CO2	L5
5.	Explain graph data structure and its types with the help of suitable examples.	CO3	L5
6.	Identify the process of quick sort. Apply the concept by taking an example.	CO4	L3
7.	Examine static and dynamic memory allocation with respect to the different types of data structures and give examples.	CO5	L4

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B.Tech CSE Sem-4

Roll No.

Total No. of Questions: 7

Date : 18-05-2026

Total No. of Pages: 2

BSc (Cyber Security), Semester-4th
Subject Name: WEB TECHNOLOGIESSubject Code: UGCA1927
M. Code: 93442

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
1.a.	Name the comparison operators in JavaScript used to compare two values.	CO-1	L1	2
1.b.	Describe basic concept of cascading style sheets used in DHTML applications.	CO-1	L2	2
1.c.	What is Form object in HTML? Write its role in web forms.	CO-2	L1	2
1.d.	Give a program to set background color of webpage in HTML.	CO-2	L2	2
1.e.	List different elements commonly used inside HTML forms for collecting user input.	CO-3	L1	2
1.f.	Outline the working of submit button in HTML forms with example.	CO-3	L2	2
1.g.	Define arrays in JavaScript and state their purpose in programming.	CO-4	L1	2
1.h.	Compare between map, filter, and reduce. Also give their examples.	CO-4	L2	2
1.i.	Write the HTML tag used to create a table.	CO-5	L1	2
1.j.	Explain the use of image attributes like width, height, and alt in HTML.	CO-5	L2	2
SECTION B				40
2.	Make a program to perform following operations on two numbers input by the user: 1) Addition 2) Subtraction 3) Multiplication 4) Division.	CO-1	L3	10
3.	Analyze the structure of a webpage by combining ordered, unordered, and definition lists. Write their appropriate uses clearly.	CO-2	L4	10
4.	Explain a webpage showing practical implementation of DHTML features, and justify how dynamic elements improve interactivity and responsiveness of the webpage.	CO-3	L5	10
5.	Evaluate the effectiveness of JavaScript error handling mechanisms and explain how try-catch improves the reliability of web applications.	CO-4	L5	10
6.	Explain the looping constructs in JavaScript and compare while and for loops with examples.	CO-4	L5	10
7.	Evaluate how table attributes like cellpadding, cellspacing, and border contribute to data presentation effectiveness in HTML tables.	CO-5	L5	10

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Roll No. Date : 19-05-2026
Total No. of Pages: 2

Total No. of Questions: 9

B.Tech (AIML), Semester-6th
Subject Name: NEURAL NETWORKS
Subject Code: BTAIML603-20
M. Code: 93677

Max. Marks: 60

Time: 03:00 Hrs.

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
a.	Why are directed graphs useful in representing neural networks?	CO-1	L1	2
b.	Give the output of a neuron implementing AND logic for input (0,1), given weights = [1,1] and threshold = 2.	CO-1	L2	2
c.	Outline the significance of network architecture in neural networks?	CO-1	L2	2
d.	Write the primary objective of Boltzmann learning in Neural Networks.	CO-2	L1	2
e.	If model accuracy = 90% on 150 samples, Obtain how many samples are incorrectly classified?	CO-2	L2	2
f.	Outline Unconstrained optimization techniques.	CO-2	L2	2
g.	Define cross-validation in machine learning.	CO-3	L1	2
h.	Obtain the output using a binary sigmoid function. Given $x_1 = 0.8$, $x_2 = 0.2$, $w_1 = 0.4$, $w_2 = 0.9$, $b = 0.5$.	CO-3	L2	2
i.	Define the term ill-posed problem in supervised learning.	CO-4	L1	2
j.	Explain the working of a Hopfield network.	CO-4	L2	2
SECTION B				20
2.	A neural network consists of 3 input neurons, 2 hidden neurons, and 1 output neuron with full connectivity, Compute the following a) Calculate total number of connections b) Represent the network as a directed graph (explain structure) c) Identify number of layers and type of architecture	CO-1	L3	5
3.	Given that the learning rate decreases from $0.5 \rightarrow 0.3 \rightarrow 0.1$, analyze its impact on the convergence speed and accuracy of the model. Explore the effect of gradually reducing the learning rate	CO-2	L4	5
4.	Determine an appropriate MLP architecture for solving the XOR (Exclusive-OR) problem, which is not linearly separable, specifying the number of input neurons, hidden layer neurons and output neurons.	CO-3	L5	5
5.	A real-time system requires fast decision-making: Explain whether RBF networks are suitable compared to deep MLPs.	CO-4	L5	5
6.	Compare the different types of perceptrons, such as single-layer and multilayer perceptrons, by discussing their architecture, learning capabilities, and suitability for solving various classification problems.	CO-3	L4	5
SECTION C				20
7.	A system uses three features to classify objects (e.g., color, size, weight). a) Model this using a neural network b) Compute output for given inputs c) Apply activation function and explain classification	CO-2	L3	10
8.	Examine the training algorithm for Back Propagation Neural Network (BPNN) and formulate the each step of the algorithm.	CO-3	L4	10
9.	Construct an RBF network architecture to approximate a nonlinear function and demonstrate how Gaussian basis functions are used in the hidden layer.	CO-4	L6	10

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Roll No.

Total No. of Questions: 9

Date : 18-05-2026

Total No. of Pages: 2

B.TECH(CSE/AMUL/AIDS/CSE IOT/CSE DS/CSE CS/RAD, Semester-4TH)
Subject Name: COMPUTER ORGANIZATION & ARCHITECTURE
Subject Code: BTES-401-18
M.Code:77627

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No	Description	CO	BL
SECTION A			
a.	Define Register Transfer Language (RTL) with suitable example.	CO-1	L1
b.	Describe restoring and non-restoring division methods.	CO-1	L2
c.	Write in detail the branch instructions of 8085.	CO-2	L1
d.	Explain the impact of slow decode stage on CPU performance.	CO-2	L2
e.	Name the DMA controller used with 8085.	CO-3	L1
f.	State the need for I/O interfaces between the CPU and peripheral devices.	CO-3	L2
g.	Write the formula to find pipeline efficiency in pipelining.	CO-4	L1
h.	Classify the pipeline hazards using an appropriate example.	CO-4	L2
i.	Find the coherence miss rate if a processor executes 1000 memory accesses. Out of these, 150 are coherence misses.	CO-5	L1
j.	Interpret the impact on execution time when cache memory is not present.	CO-5	L2
SECTION B			
2.	Identify the concept of multiplexed address and data bus of 8085.	CO-1	L3

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Q No	Description	CO	BL
3.	Compare ripple carry adder and carry look-ahead adder by analyzing their speed and hardware requirements.	CO-2	L4
4.	Evaluate the key characteristics that differentiate interrupts from exceptions and analyze their impact on system performance.	CO-3	L5
5.	Determine the four types of Flynn's classification and their effectiveness with suitable examples.	CO-4	L5
6.	Justify the role of cache memory in bridging the speed gap between CPU and main memory.	CO-5	L5
SECTION C			
7.	Explore the role of interfacing devices, also investigate the data communication using USB and SCSI.	CO-3	L4
8.	a. Determine a simple pipeline architecture for instruction execution and explain its stages. b. A four stage pipeline has the stage delays as 150, 120, 160 and 140 ns respectively. Registers are used between the stages and have a delay of 5 ns each. Assuming constant clocking rate, calculate the total time taken to process 1000 data items on the pipeline.	CO-4	L5
9.	Explain the significance of memory interleaving with a suitable diagram in multiprocessor system.	CO-5	L5

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2 | M-77627

Roll No. Date : 15-05-2026
Total No. of Pages: 4

Total No. of Questions: 9

B.TECH(ECE), Semester-4TH
Subject Name: OPERATING SYSTEM
Subject Code: BTCS-402-18
M. Code: 79262

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
a.	List any two characteristics of third-generation operating systems with examples.	CO-1	L1	2
b.	Compare different types of system calls.	CO-1	L2	2
c.	Define "Thread". How is a thread different from a process?	CO-2	L1	2
d.	Define Critical Section. Why must it be protected in a multi-process environment?	CO-2	L1	2
e.	What is meant by deadlock detection and deadlock recovery?	CO-3	L1	2
f.	Explain atleast three strategies for deadlock prevention, and explain how each breaks one of the necessary conditions.	CO-3	L2	2
g.	Why is virtual memory needed even when ample physical RAM is present?	CO-4	L1	2
h.	Explain the concept of page fault with suitable examples and diagrams.	CO-4	L2	2
i.	List different types of I/O devies in Operating system with suitable examples.	CO-5	L1	2
j.	Why is DMA faster than interrupt I/O with suitable examples?	CO-6	L1	2
SECTION B				20
2.	Simplify the concept of OS as a resource manager to explain CPU and memory sharing in a multi-user system	CO-1	L3	5
3.	Distinguish many-to-one and one-to-one multithreading models with suitable example.	CO-2	L4	5
4.	Consider non-preemptive SJF with the following processes (arrival time, burst time): P1(0,5) P2(1,3),P3(2,8).Measure the Average Total Average Time and average Waiting time.	CO-3	L5	5
5.	A system uses variable partition memory allocation where processes are allocated only the required memory. justify how this technique may lead to external fragmentation.	CO-4	L5	5
6.	Inspect the FCFS disk scheduling algorithm to determine the total head movement for the request queue {82, 170, 43, 140, 24, 16, 190} with initial head position at 50.	CO-6	L4	5
SECTION C				20
7.	Examine the concept of a process and explain how multiple processes share CPU and memory resources in an operating system.	CO-2	L4	10
8.	Explain the linked list method of free-space management. How does it lead to scattered free blocks and fragmentation?	CO-5	L5	10
9.	Explain the SSTF disk scheduling algorithm to determine the total head movement for the request queue {176, 79, 34, 60, 92, 11, 41, 114} with initial head position at 50.	CO-6	L5	10

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Date : 14-05-2026
Total No. of Pages: 3

Total No. of Pages: 3
, Semester-4TH

VALUES-2

Max. Marks: 60

Questions carrying

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Q No.	Description	CO	BL
SECTION A			
a.	What is motivation? How is it related to human aspiration? 'येवटा वी वै?' हिन मँठी आवांन नल विहँ मँषीपड वै? प्रेरणा क्या है? यह मानव आकांक्षा से कैसे संबंधित है?	CO-1	L1
b.	Outline any two indicators of prosperity in the current scenario. 'मेनुटा मविडी हिन धनराखी से किसे से मैवेडें सी वुपवेम हिन। वर्तमान परिदृश्य में समृद्धि के किसी दो संकेतकों की रूपरेखा प्रस्तुत करें।	CO-1	L2
c.	What is Sanyam? How does it contribute to good health? 'मैकम वी वै?' हिन सेवगी भितड हिन विहँ येवटासन पभुँसा वै? संयम क्या है? यह अच्छे स्वास्थ्य में कैसे योगदान देता है?	CO-2	L1
d.	Explain how harmony between the 'I' and the Body contributes to a balanced and healthy life. 'नै' अडे मरीव हिनवत मंश मँडुलिन अडे भितडमँट सीहन हिन विहँ येवटासन पभुँसु वै, हिनविआ वतै। 'नै' और शरीर के बीच सामंजस्य संतुलित और स्वस्थ जीवन में कैसे योगदान देता है, स्पष्ट कीजिए।	CO-2	L2
e.	Define justice in the context of nine universal values in relationships. 'मँषीपड हिन नँ मरहडैम मँसुं दे मँरहड हिन निअं नै पविडामिड वतै। संबंधों में नौ सार्वभौमिक मूल्यों के संदर्भ में न्याय को परिभाषित कीजिए।	CO-3	L1
f.	Illustrate the meaning of universal harmonious order in society. 'ममन हिन मरहडैम मंशीवतट हखी हिनमष दे आवड नै ममशवि।	CO-3	L2

Q. No.	Description	CO
	समाज में सार्वभौमिक सामंजस्यपूर्ण व्यवस्था के अर्थ को स्पष्ट कीजिए।	
g.	Explain existence as co-existence of mutually interacting units in all-pervasive space. मल्टीट्रैपमी अंतर्विक्स हिसु पतमपव विरिअमोल हिलपीअं दे मति-अमडिउड हेंम अमडिउड सी हिअमिअ वत। सर्वव्यापी अंतरिक्ष में परस्पर क्रिया करने वाली इकाइयों के सह-अस्तित्व के रूप में अस्तित्व की व्याख्या कीजिए।	CO-1
h.	Show with example how recyclability and self-regulation contribute to harmony in nature. छिलवत ममड डेंम वि दुषव हवडेंवेलड अडे मई-निडवत वुडवड हिस मंश विहें सरुपी तेव देन। उदाहरण सहित बताइए कि पुनर्चक्रीयता और स्व-नियमन प्रकृति में सामंजस्य में कैसे योगदान देते हैं।	CO-2
i.	Define Competence in Professional Ethics. पेशावर नैतिकता हिस जेवडा ठै भवजमिड वते। व्यावसायिक नैतिकता में दक्षता को परिभाषित कीजिए।	CO-3
j.	Explain the basis of humanistic education. भठेवडाहसी मिमिअ दे अपाव सी हिअमिअ वते। मानवतावादी शिक्षा के आधार की व्याख्या कीजिए।	CO-4
SECTION B		
2.	Construct a framework to achieve correct understanding of happiness and prosperity. धुमो अडे धुमहासी सी मली ममस पूपड वतन लसी हिस ह्वा डिअव वते। सुख और समृद्धि की सही समझ प्राप्त करने हेतु एक रूपरेखा तैयार कीजिए।	CO-1
3.	Identify the characteristics and activities of the Self ('I') in real-life behavior. अमली मीहन दे हिलव हिस मई ('अ') सीअं हिमसेडहं अडे गडिहिपीअं सी पडहट वते। वास्तविक जीवन के व्यवहार में स्व ('मैं') की विशेषताओं और गतिविधियों की पहचान कीजिए।	CO-2
4.	Apply the values of trust and respect in real-life situations to build and develop healthy relationships. मिडअमैट मीमंणं दे निवमट अडे हिलव लसी अमली मीहन सीअं मविडीअं हिस जवेमे अडे मडिलव दे मेंड ठै ललु वते। स्वस्थ संबंधों के निर्माण और विकास हेतु वास्तविक जीवन की परिस्थितियों में विश्वास और सम्मान को लागू कीजिए।	CO-3



Roll No.

Total No. of Questions: 7

Date : 14-05-2026
Total No. of Pages: 2BSc (AIML), Semester-4th
Subject Name: ADVANCE PYTHON PROGRAMMING
Subject Code: UGCA1983 E2
M. Code : 91712

Time: 03:00 Hrs.

Max. Marks: 60

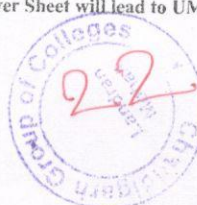
INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
1.a.	List the SQL commands for creating table with the help of an example.	CO-1	L1	2
1.b.	Classify Database Management System types based on data model.	CO-1	L2	2
1.c.	Explain the term missing data handling.	CO-2	L2	2
1.d.	Name any two data structures used in Pandas.	CO-2	L1	2
1.e.	Describe the term iteration over rows in DataFrame.	CO-2	L2	2
1.f.	Summarize the definition and overview of descriptive statistics.	CO-2	L2	2
1.g.	Write any four matrix operations.	CO-3	L1	2
1.h.	Illustrate histogram plotting in NumPy with its diagram.	CO-3	L2	2
1.i.	How does "supervised learning" represent in machine learning?	CO-4	L1	2
1.j.	Interpret the purpose of the Scikit-learn library in machine learning tasks.	CO-4	L2	2
SECTION B				40
2.	Develop a SQL query to select all records from a Customer table and draw a proper table of customer using the fields (CusID, CusName, Items, Quantity, Amount) with the help of queries.	CO-1	L3	10
3.	Choose the linear algebra operations that are implemented using NumPy. List the advantages of NumPy arrays in computations.	CO-3	L5	10
4.	Execute array slicing techniques using NumPy to perform data analysis tasks and solve relevant numerical problems effectively.	CO-3	L3	10
5.	Examine security issues challenges related to database connections in Database Management System.	CO-2	L4	10
6.	Explain NumPy techniques for efficient array processing, considering time complexity and memory constraints.	CO-3	L5	10
7.	Compare the statistical functions Mean(), Median(), Mode(), Standard Deviation, and Variance in SciPy based on their characteristics and applications.	CO-4	L5	10

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Roll No.

Total No. of Questions: 7

Date : 14-05-2026
Total No. of Pages: 2BSc (Cyber Security), Semester-4th
Subject Name: CYBER LAWS AND IPR
Subject Code: UGCA1949 E2
M. Code : 93439

Time: 03:00 Hrs.

Max. Marks: 60

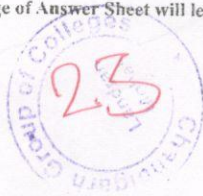
INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
1.a.	Explain the relationship between statutory law and regulatory law in the context of IT professionals.	CO-1	L1	2
1.b.	Outline the role of the IT Act, 2000 in regulating cyber activities in India.	CO-1	L2	2
1.c.	What is identity theft and explain how it is committed online.	CO-2	L1	2
1.d.	Explain digital forgery with a real-world example and its legal implications.	CO-2	L2	2
1.e.	Define invention in the context of patent law and explain its importance in innovation.	CO-3	L1	2
1.f.	Describe the benefits of IPR in promoting innovation and protecting creators' rights.	CO-3	L2	2
1.g.	Compare copyright protection with trademark protection in terms of duration and subject matter.	CO-4	L1	2
1.h.	Define fair use and explain how copyrighted material can be used legally under certain conditions.	CO-4	L1	2
1.i.	Explain the step-by-step process of granting a patent.	CO-3	L2	2
1.j.	Define service mark and explain how it differs from a trademark.	CO-4	L1	2
SECTION B				40
2.	Apply the concept of jurisdiction to an online fraud case and explain how courts determine their authority when the offender and victim are located in different geographical regions.	CO-1	L3	10
3.	Compare and contrast cyber crimes against individuals and institutions with suitable examples and legal implications.	CO-2	L4	10
4.	Discuss and justify the important role of copyright in the protection of software, explaining how copyright law safeguards computer programs, source code, and digital applications.	CO-4	L5	10
5.	Justify and analyze different types of trademarks, and evaluate their usefulness in protecting brand identity.	CO-4	L5	10
6.	Critically assess the limitations and challenges of copyright protection in the digital era, particularly in relation to online content sharing, digital reproduction, and unauthorized distribution of creative works.	CO-4	L5	10
7.	Elaborate the related rights in musical performance and explain legal protection.	CO-5	L6	10

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Roll No.

Total No. of Questions: 7

Date : 11-05-2026
Total No. of Pages: 2

BSc (AIML), Semester-4th
Subject Name: IMAGE PROCESSING
Subject Code: UGCA1974 E2
M. Code: 91708

Time: 03:00 Hrs.

INSTRUCTIONS TO CANDIDATES:

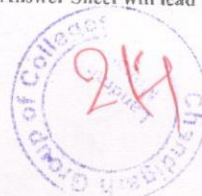
Max. Marks: 60

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
1.a.	State the function of rotation transformation.	CO-1	L1	2
1.b.	Describe color models of computer graphics.	CO-1	L2	2
1.c.	State the meaning of image acquisition.	CO-2	L1	2
1.d.	Explain the concept of pixel connectivity in images.	CO-2	L2	2
1.e.	Explain how gray-level transformations improve image contrast.	CO-3	L2	2
1.f.	State the function of median filter.	CO-3	L1	2
1.g.	Define Butterworth low-pass filter in the context of image smoothing.	CO-4	L1	2
1.h.	Describe how cutoff frequency controls the filtering effect.	CO-4	L2	2
1.i.	Define image restoration in digital image processing.	CO-5	L1	2
1.j.	Describe the effect of Gaussian noise on pixel intensity distribution.	CO-5	L2	2
SECTION B				40
2.	Compute final coordinates of a rectangle with vertices (0,0), (2,0), (2,3), (0,3) after applying scaling (2,2) followed by translation (1,1).	CO-1	L3	10
3.	Analyze role of image processing in different application areas such as medical imaging and remote sensing with respect to functionality and impact.	CO-2	L4	10
4.	Evaluate histogram equalization and contrast stretching in terms of their effectiveness in improving visual quality.	CO-3	L5	10
5.	Explain the role of edge detection techniques in segmentation processes for accurately identifying object boundaries and improving the precision of region separation in digital images.	CO-4	L5	10
6.	Distinguish linear and nonlinear filtering techniques in terms of processing and results.	CO-5	L4	10
7.	Justify the use of frequency domain filtering techniques for image enhancement in comparison to spatial domain approaches.	CO-3	L5	10

NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the student.



Roll No.

Date : 11-05-2026

Total No. of Questions: 9

Total No. of Pages: 2

B.TECH(CSE/AIML/AIDS/CSE IOT/CSE DS/CSE CS/RAI), Semester-4TH

Subject Name: DESIGN & ANALYSIS OF ALGORITHMS

Subject Code: BTCS-403-18

M.Code : 77629

Time: 03:00 Hrs.

Max. Marks: 60

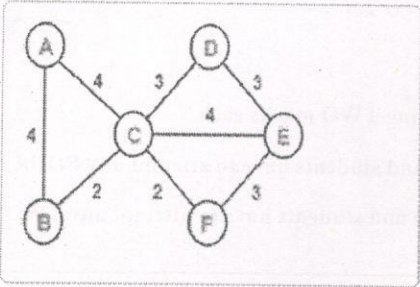
INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
a.	State the meaning of rate of growth of an algorithm.	CO-1	L1	2
b.	Outline the concept of time and space tradeoff in terms of algorithm complexity.	CO-1	L2	2
c.	What is Brute Force Technique ?	CO-2	L1	2
d.	Explain the general Principle of Dynamic Programming.	CO-2	L2	2
e.	List the applications of Breadth First Search Traversal algorithm.	CO-3	L1	2
f.	Differentiate among the single source shortest path algorithms with suitable example.	CO-3	L2	2
g.	Define Vertex Cover Problem with the help of an example.	CO-4	L1	2
h.	Explain the concept of Triangle inequality in a weighted graph.	CO-4	L2	2
i.	Define heuristics and give an example showing that they provide faster but not always optimal solutions.	CO-5	L1	2
j.	Compare the Hamiltonian and Eulerian Tour with respect to twice around the tree approximation algorithm.	CO-5	L2	2
SECTION B				20
2.	Identify the growth rate of the function $5n+35$ and prove that it belongs to the class $O(n)$.	CO-1	L3	5
3.	Analyze the concept of Backtracking and solve the knapsack problem using backtracking method for the given values of profit and weights $W=8$, $n=4$, $P= \{3,5,6,10\}$, $w=\{2, 3, 4, 5\}$	CO-2	L4	5

Q No.	Description	CO	BL	Marks																									
4.	Make use of Prim's algorithm to find the minimum cost spanning tree for the given graph starting from vertex 'A'. 	CO-3	L3	5																									
5.	Explain various NP Hard problems with the help of examples.	CO-4	L5	5																									
6.	Evaluate the procedure for twice around the tree approximation algorithm to solve TSP on the given graph and find the total cost of the tour. Also, write the steps of an algorithm. <table border="1"> <thead> <tr> <th></th><th>A</th><th>B</th><th>C</th><th>D</th></tr> </thead> <tbody> <tr> <th>A</th><td>0</td><td>4</td><td>8</td><td>6</td></tr> <tr> <th>B</th><td>4</td><td>0</td><td>5</td><td>7</td></tr> <tr> <th>C</th><td>8</td><td>5</td><td>0</td><td>3</td></tr> <tr> <th>D</th><td>6</td><td>7</td><td>3</td><td>0</td></tr> </tbody> </table>		A	B	C	D	A	0	4	8	6	B	4	0	5	7	C	8	5	0	3	D	6	7	3	0	CO-5	L5	5
	A	B	C	D																									
A	0	4	8	6																									
B	4	0	5	7																									
C	8	5	0	3																									
D	6	7	3	0																									
SECTION C				20																									
7.	Analyze the difference between Fractional Knapsack and 0/1 Knapsack problems in terms of solution approach and optimality.	CO-2	L4	10																									
8.	Packets are sent through a network with capacity constraints as shown below. $S \rightarrow A = 10$ $S \rightarrow B = 10$ $A \rightarrow B = 5$ $A \rightarrow C = 10$ $B \rightarrow T = 15$ $C \rightarrow T = 10$ Apply the Ford-Fulkerson algorithm to: a) Find the maximum flow from source S to sink T b) Show at least two augmenting paths c) Draw the residual graph after each iteration	CO-3	L3	10																									
9.	Explain Randomization and Approximation algorithms with the help of an example.	CO-5	L5	10																									

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Roll No.

Date : 11-05-2026
Total No. of Pages: 2

Total No. of Questions: 7

BSc (Cyber Security), Semester-4th
Subject Name: DIGITAL FORENSICS
Subject Code: UGCA2002 E2
M-Code: 93438

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
1.a.	Define the concept of a cybercrime scene in forensic practice.	CO-1	L1	2
1.b.	Explain the application of criminalistics techniques in cyber investigations.	CO-1	L2	2
1.c.	Interpret the digital forensic procedures that ensure the admissibility of evidence.	CO-1	L2	2
1.d.	State the term 'unretrieved communications' in digital forensics .	CO-2	L1	2
1.e.	Outline the role of court orders in maintaining the validity of collected evidence.	CO-2	L2	2
1.f.	Describe the key components required for collecting evidence in computer forensics.	CO-2	L2	2
1.g.	Write any two software tools used in computer forensics investigations.	CO-3	L1	2
1.h.	Describe steps to start a computer forensic investigation following a data theft complaint.	CO-3	L2	2
1.i.	Define Information Technology Act, 2000, applicable to cyber offences in the given scenario.	CO-4	L1	2
1.j.	Interpret the importance of preserving network evidence in a forensic investigation	CO-4	L2	2
SECTION B				40



Q No.	Description	CO	BL	Marks
2.	Investigate the appropriate procedures to conduct a comprehensive cybercrime scene analysis, outlining each step involved in identifying, collecting, preserving, and documenting digital evidence.	CO-1	L4	10
3.	Determine the extent to which search and seizure protocols are followed during a digital forensic investigation and handling of evidence in legal admissibility standards.	CO-2	L5	10
4.	Utilize the secure configuration requirements of shared folders used for digital evidence storage in digital forensic environments, highlighting how these configurations help ensure confidentiality, integrity, and chain of custody of the evidence.	CO-2	L3	10
5.	Analyze the concept of Network Forensics by examining its fundamental definition and core objectives with its major components.	CO-3	L4	10
6.	Compare any two open-source tools used for network forensic analysis and classify their key features.	CO-3	L4	10
7.	Evaluate the importance of email and web forensics in cybercrime investigation, and justify their effectiveness in identifying, preserving, and presenting digital evidence in court proceedings.	CO-4	L5	10

NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the student.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (CSE/AIML/AIDS/CSE IOT/CSE DS/CSE CS/RAI), Semester 4th

OPERATING SYSTEMS

Subject Code: BTCS-402-18

M.Code:77628

Date of Examination: 07-05-2026

Time: 3 Hrs.**Max. Marks: 60****INSTRUCTIONS TO CANDIDATES:**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Identify key responsibilities of an Operating System in resource management.	CO-1	L1
b.	Differentiate between batch and time-sharing systems with suitable scenarios.	CO-1	L2
c.	Distinguish between user-level and kernel-level threads.	CO-2	L2
d.	Explain how a process moves between various states during execution in an operating system.	CO-2	L2
e.	Outline the causes of race conditions in shared memory systems.	CO-3	L1
f.	Interpret the critical section problem in concurrent execution.	CO-3	L2
g.	Explain paging mechanism with address translation concept.	CO-4	L2
h.	Explain Direct Memory Access (DMA) and its role in I/O operations.	CO-5	L2
i.	Define boot block and explain its role in system initialization.	CO-6	L1
j.	List causes and handling of bad blocks in disks.	CO-6	L1
SECTION-B			
2.	Analyze the trade-offs between Monolithic, Layered, and Microkernel OS architectures.	CO-1	L4
3.	Differentiate between pre-emptive and non-pre-emptive scheduling algorithms. Illustrate your answer by explaining how process execution differs in FCFS and Round Robin (RR) scheduling when multiple processes arrive at different times.	CO-2	L4

4.	Evaluate the effectiveness of synchronization mechanisms Peterson's, Semaphores and Monitors in avoiding race conditions.	CO-3	L5
5.	Compare contiguous memory allocation and paging with respect to fragmentation and efficiency.	CO-4	L5
6.	Explain the working of FCFS and SSTF disk scheduling algorithms. Discuss their advantages and disadvantages with respect to seek time and starvation.	CO-6	L5
SECTION-C			
7.	A concurrent system suffers from race conditions, deadlock, and starvation due to improper synchronization. Analyze the causes of these issues and propose a refined synchronization strategy to ensure correct execution.	CO-3	L4
8.	A system uses virtual memory with a fixed number of page frames 3. The page reference string is: 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2 a) Examine FIFO, LRU, and Optimal page replacement algorithms and calculate the number of page faults for each. b) Analyze the results and compare the algorithms in terms of efficiency and overhead. c) Justify which algorithm is most suitable for practical virtual memory management systems.	CO-4	L4
9.	Design a process management system that incorporates process states, state transitions, and an efficient Process Control Block (PCB) structure. Justify how your design minimizes context switching overhead and improves system performance.	CO-5	L6

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Roll No.

Total No. of Questions: 7

Date : 07-05-2026

Total No. of Pages: 2

BSc (AIML), Semester-4th
Subject Name: DATA SCIENCE

Subject Code: UGCA1978 E2

M-Code: 91707

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
1.a.	What is meant by semi-structured data?	CO-1	L1	2
1.b.	Summarize why data integration is required.	CO-1	L2	2
1.c.	Define parsing in data science systems.	CO-2	L1	2
1.d.	Give any two causes of missing data .	CO-2	L2	2
1.e.	What is meant by discrete and continuous data?	CO-3	L1	2
1.f.	Give importance of mapping in visualization.	CO-3	L2	2
1.g.	Define overfitting in model performance.	CO-4	L1	2
1.h.	Summarize the importance of cross validation in model development.	CO-4	L2	2
1.i.	Define k-fold cross validation.	CO-5	L1	2
1.j.	Explain batch processing in Data Sceince.	CO-5	L2	2
SECTION B				40
2.	Make use of data transformation techniques and identify their impact on data accuracy and system performance.	CO-1	L3	10
3.	Explain data governance,data security,data management in detail and discuss their roles and importance in ensuring effective data handling and organizational decision-making.	CO-2	L4	10
4.	Evaluate the choice of chart type that affects the interpretation of data.	CO-3	L5	10
5.	Evaluate different visualization techniques for presenting comparison between multiple variables.	CO-4	L5	10
6.	Organize the role of out-of-sample evaluation metrics in assessing the predictive performance of a model.	CO-4	L3	10
7.	Evaluate polynomial regression and pipelines and their significance in prediction.	CO-5	L5	10

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Roll No.

Total No. of Questions: 7

BSc (Cyber Security), Semester-4th
Subject Name: NETWORK SECURITY
Subject Code: UGCA2001 E2
M. Code: 93437

Date : 07-05-2026
Total No. of Pages: 2

Time: 03:00 Hrs.

Max. Marks: 60

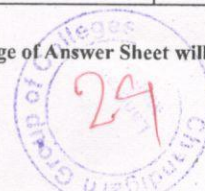
INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
1.a.	List any two common names of cyber threats.	CO-1	L1	2
1.b.	Differentiate between Integrity and Availability with their working in security.	CO-1	L2	2
1.c.	Outline the working principle of Linux Firewall with a simple example.	CO-2	L2	2
1.d.	Describe the concept of Asymmetric Cryptography in your own words.	CO-2	L2	2
1.e.	Classify the components of cryptographic attacks.	CO-3	L2	2
1.f.	Explain the role of message digest(MD) in hash algorithms.	CO-4	L2	2
1.g.	List any two types of Intrusion Detection Systems in network security.	CO-4	L1	2
1.h.	Illustrate the basic working of SSL to secure communication.	CO-5	L2	2
1.i.	Compare packet filtering firewall and stateful firewall.	CO-5	L2	2
1.j.	Explain the concept of the Decryption Algorithm that used in network security.	CO-3	L2	2
SECTION B				40
2.	Use the role of attacks in network security with Denial-of-Service (DoS) attacks and Distributed Denial-of-Service (DDoS) with the help of example.	CO-1	L3	10
3.	Analyze the requirements of a secure hash function used in cryptographic systems with its two techniques.	CO-2	L4	10
4.	Explain the role of Monoalphabetic Substitution and Transposition Cipher in network security with suitable examples.	CO-3	L5	10
5.	Explain the different file operations based on their functionalities and analyze their practical applications in network systems.	CO-4	L5	10
6.	Interpret the concept of advanced network security systems and their advantages and limitations in modern computing.	CO-5	L5	10
7.	Determine the effect of digital signature and message authentication techniques used in networks with the role of hash functions.	CO-5	L5	10

NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the student.



Roll No.

Date : 04-05-2026
Total No. of Pages: 2

Total No. of Questions: 7

BSc (AIML), Semester-4th
Subject Name: MACHINE LEARNING
Subject Code: UGCA1977 E2
M Code: 91706

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
1.a.	What is the Divisive clustering technique? Mention its applications.	CO-1	L1	2
1.b.	Classify the Convolutional Neural Network (CNN) algorithm and explain how it works.	CO-1	L2	2
1.c.	State the role of a leaf node in a decision tree with suitable example.	CO-2	L1	2
1.d.	Label the meaning of Conditional probability and its role in Bayesian learning.	CO-2	L1	2
1.e.	Explain the role of distance metrics (Euclidean/Manhattan) in KNN.	CO-3	L2	2
1.f.	Write the one iteration of Q-learning update rule.	CO-3	L1	2
1.g.	Lits the major application areas of genetic programming.	CO-6	L1	2
1.h.	Outline the working of a genetic algorithm step by step in solving optimization problems.	CO-6	L2	2
1.i.	Compare the Logistic Discrimination and Logistic Regression with example.	CO-5	L2	2
1.j.	Describe the perceptron model by analyzing its decision boundary and classification capability.	CO-4	L2	2
SECTION B				40
2.	Investigate reinforcement learning over supervised learning in dynamic environments with reasoning.	CO-1	L4	10
3.	Investigate the issue of overfitting in decision trees and suggest prevention techniques.	CO-2	L4	10
4.	Evaluate the suitability of SVM for large-scale datasets and recommend alternative models with proper justification.	CO-3	L5	10
5.	Compute the Conditional probability with a real world example also simplify the meaning of sample spaces.	CO-4	L3	10
6.	Explain the limitations of the perceptron in classifying spam vs non-spam emails with complex patterns where the data is not linearly separable.	CO-5	L5	10
7.	Classify different mutation operations to maintain diversity in the population and avoid premature convergence.	CO-6	L4	10

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Roll No.

Total No. of Questions: 7

Date : 04-05-2026
Total No. of Pages: 2BSc (Cyber Security), Semester-4th
Subject Name: DATABASE MANAGEMENT SYSTEM
Subject Code: UGCA1922 E2
M. Code: 93436

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

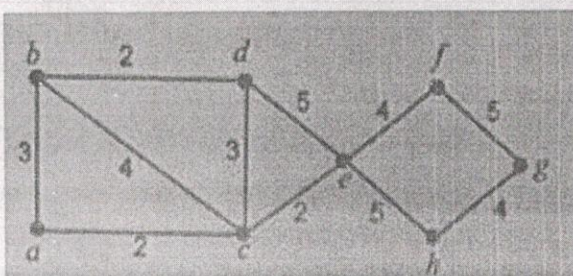
SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
1.a.	What is an Attribute in the Entity-Relationship (ER) model?	CO-1	L1	2
1.b.	Explain the advantages of a Database Management System (DBMS) over the traditional file system approach in data management.	CO-1	L2	2
1.c.	State the features of the relational data model.	CO-1	L2	2
1.d.	List the components of an SQL query.	CO-2	L1	2
1.e.	Compare DCL and TCL commands based on their functions in database management.	CO-2	L2	2
1.f.	Illustrate the role of aggregate functions in SQL with examples.	CO-2	L2	2
1.g.	What is meant by second Normal Form of normalization?	CO-3	L1	2
1.h.	Illustrate the steps involved in converting a relation into Third Normal Form (3NF).	CO-3	L2	2
1.i.	Define the term integrity constraints in DBMS.	CO-4	L1	2
1.j.	Describe the concept of checkpoint in database recovery.	CO-4	L2	2
SECTION B				40
2.	Make use of Entity-Relationship (ER) modeling to show how entities and relationships are structured in a database.	CO-1	L3	10
3.	Interpret the advantages of PL/SQL over SQL based on their performance and functionality in database systems.	CO-2	L5	10
4.	Construct an Entity-Relationship (ER) model for a real-world scenario and define how entities, attributes, and relationships are related to each other.	CO-1	L3	10
5.	Distinguish between views and base tables by analyzing their structural and functional characteristics.	CO-2	L4	10
6.	Differentiate normalization stages by analyzing the type of redundancy removed at each normal form.	CO-3	L4	10
7.	Explain distributed databases based on their limitations and performance issues.	CO-4	L5	10

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Q No.	Description	CO	BL
3.	In a class of boys, there are 45 boys who play cards and 30 boys play carrom. How many boys play both games? Calculate how many play cards only and how many play carrom only.	CO-2	L3
4.	Solve for validity of the following argument: If a man is bachelor, he is happy. If a man is happy, he dies young. Therefore bachelor dies young.	CO-3	L6
5.	Consider an algebraic system $(G,*)$ where G is set of all non zero real numbers and $*$ is a binary operation defined by $a*b = ab/4$. Show that $(G,*)$ is an abelian group.	CO-4	L5
6.	Explain the following terms with an example (a) Isomorphic graph (b) Cut set (c) Bipartite Graph	CO-5	L5
SECTION C			
7.	Analyze $\gcd(228,342,420)$ and find x,y,z (integers) so that $\gcd(228,342,420) = 228x+342y+420z$.	CO-2	L4
8.	(a) Assume that H be a subgroup and K be a normal subgroup of a group G . Prove that HK is a subgroup of G . (b) Prove that a non empty subset H of a group G is a subgroup if $ab^{-1} \in H \quad \forall a, b \in H$	CO-4	L4
9.	Construct the minimal spanning tree for the following weighted connected graph using Kruskal's Algorithm: 	CO-5	L6

NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the student.



Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (CSE/IOT), Semester-5th

COMPUTER NETWORKS

Subject Code: BTCS-504-18

M.Code: 78323/92362

Date of Examination: 19-05-2025

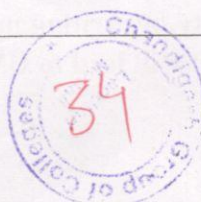
Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What do you mean by Data Communication?	CO-1	L1
b.	Outline how data is represented and flows through the layers of the OSI model?	CO-1	L2
c.	List the applications of repeaters.	CO-2	L1
d.	Explain with a diagram how piggybacking improves efficiency in duplex communication?	CO-2	L2
e.	Define Netid and Hostid with reference to IP addressing.	CO-3	L1
f.	Identify the class of the following IPv4 addresses: a) 132.16.45.7 b) 226.0.0.5 c) 130.25.10.50 d) 194.100.109.34	CO-3	L2
g.	Explain the reasons for the need to transition from IPv4 to IPv6.	CO-4	L2
h.	Illustrate the role of the transport layer in multiplexing data from different applications.	CO-5	L2
i.	Summarize the purpose of an SNMP trap in network management.	CO-6	L2
j.	What is the role of a public key in verifying a digital signature?	CO-6	L1
SECTION-B			
2.	Examine the strengths and weaknesses of different transmission media (twisted pair, coaxial cable, fiber optics, radio, microwave, satellite) and recommend the most suitable one for large-scale enterprises.	CO-1	L4



3.	Use CRC with generator polynomial 1011 to calculate the transmitted frame for the data 110101. Simplify all steps of binary division.	CO-2	L4
4.	Formulate the effectiveness of Class A, B, and C addressing for modern internet requirements. Justify your answer with example of each class.	CO-3	L6
5.	Apply your knowledge of TCP and UDP to identify which protocol is more suitable for the following scenarios and justify your choice: a) Online video streaming b) File transfer between two systems	CO-4	L5
6.	Classify the different functions of Simple Mail Transfer Protocol (SMTP) and analyze how each function (such as message submission, relay, and delivery) impacts the efficiency and reliability of email communication?	CO-6	L3
SECTION-C			
7.	Inspect the role of the OSI model as a reference standard in computer networking. Explain in detail the purpose of each of the seven layers, and justify how their separation simplifies network design, troubleshooting, and protocol development?	CO-1	L4
8.	Identify the key network problems that can be addressed by congestion control algorithms. Explain how these algorithms help prevent packet loss, reduce delays, and maintain network performance, and provide examples of scenarios where they are applied?	CO-4	L3
9.	Determine the structure of a TCP segment header. Analyze each field, including source port, destination port, sequence number, acknowledgment number, flags, window size, checksum, urgent pointer, and options. Illustrate your explanation with a neat diagram.	CO-5	L5

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Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (CSE DS / AIML), Semester 5th
DATA VISUALIZATION USING TABLEAU

Subject Code: BTAIML 505-20

M.Code: 92351 / 93181

Date of Examination: 19-05-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	List any four applications of data visualization.	CO-1	L1
b.	Explain the role of data visualization in analyzing data.	CO-1	L2
c.	Explain the view that is used to connect multiple sheets in a single view.	CO-1	L2
d.	Define an "independent axis" in a chart.	CO-2	L1
e.	Explain the purpose of hierarchies in Tableau data.	CO-2	L2
f.	Explain why a calculated field might be useful in Tableau.	CO-2	L2
g.	Define a "Pareto chart" with example.	CO-3	L1
h.	Illustrate the use of a bullet graph.	CO-3	L2
i.	Define a one-dimensional chart and give an example.	CO-4	L1
j.	Compare data blending and data joining in Tableau.	CO-4	L2
SECTION-B			
2.	Compare various types of files used in Tableau.	CO-1	L4
3.	Identify steps to filter a view to display only the top 10% of values in Tableau.	CO-2	L3
4.	Evaluate the use of histogram versus a box-and-whisker plot in analysis.	CO-3	L5
5.	Analyze how to make comparisons meaningful in a line chart with multiple measures on different scales.	CO-4	L4
6.	Explain a bullet graph in Tableau and also justify how does it provide more insight compared to a simple bar chart.	CO-3	L5
SECTION-C			
7.	Identify the procedural steps involved in establishing the environmental setup for Tableau software.	CO-1	L3

8.	Apply the concept of small multiples to analyze variations across different categories with a suitable example.	CO-3	L3
9.	Justify how trends, forecasting and storytelling together can provide deeper business insights rather than using them individually.	CO-4	L5

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Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (AIDS), Semester-5th

MACHINE LEARNING

Subject Code: BTCS 618-18

M.Code: 93947

Date of Examination: 19-05-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What is the difference between training error and generalization error in model training?	CO-1	L1
b.	Interpret the steps for designing a learning system.	CO-1	L2
c.	Define min-max scaling normalization technique.	CO-2	L1
d.	Compare different data reduction techniques.	CO-2	L2
e.	Which regression model will be used for predicting the house price and why?	CO-3	L1
f.	Interpret a scatter plot where points cluster tightly around an upward line.	CO-3	L2
g.	List two applications of classification techniques.	CO-4	L1
h.	Distinguish Gaussian vs Multinomial Naïve Bayes algorithm.	CO-4	L2
i.	What is a fitness function in genetic algorithm?	CO-5	L1
j.	Summarize applications of ANN.	CO-5	L2
SECTION-B			
2.	Examine the purpose of reinforcement learning in the training process of an employee.	CO-1	L4
3.	Identify the different cross validation techniques in model training.	CO-2	L3
4.	Evaluate a multiple regression model to predict rent using area, locality index and age.	CO-3	L5
5.	Inspect the role of Naïve Bayes algorithm in Movie recommendation system with suitable example.	CO-4	L4



6.	Compare Genetic Algorithm with gradient-based optimization for model training. Evaluate strengths and limitations of GA.	CO-5	L5
SECTION-C			
7.	Analyze the bias–variance trade-off with examples. Inspect strategies to manage it for small vs large datasets.	CO-1	L4
8.	Examine the role of RMSE, MAE, correlation, Confusion matrix in model training with example.	CO-3	L4
9.	Recommend an SVM kernel for concentric-circle separable data. Justify your choice.	CO-4	L5

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Total No. of Pages:02

Total No. of Questions: 09

B.Tech (CSE-DS/AIDS/AIML), Semester-5th
STATISTICAL COMPUTING TECHNIQUES USING R

Subject Code: BTES-501-20

M.Code: 92341/93936/93170

Date of Examination: 22-5-2026

Time: 3 Hrs.**Max. Marks: 60****INSTRUCTIONS TO CANDIDATES:**

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION-B contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. SECTION C contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Select one function used to read external data into R.	CO-1	L1
b.	List two examples of user-defined objects in R.	CO-1	L1
c.	Outline the elements of workspace in R.	CO-2	L2
d.	Demonstrate the use of brackets in R.	CO-2	L2
e.	Define exploratory data analysis in the context of statistical computing.	CO-3	L1
f.	Explain the purpose of <code>set.seed()</code> for simulation in R.	CO-3	L2
g.	Explain statistical inference with example in R.	CO-4	L2
h.	Demonstrate with R code how <code>boot()</code> function can be applied with syntax.	CO-4	L2
i.	Explain the purpose of using <code>.R</code> history in R.	CO-5	L2
j.	Contrast S3 and S4 classes in R.	CO-5	L2
SECTION-B			
2.	Analyze the attributes of vectors with example.	CO-1	L4
3.	Explain the help system in R with examples.	CO-2	L5
4.	Determine the role of scatterplots and boxplot in identifying data relationships with R syntax.	CO-3	L5
5.	Construct contingency table from data and vector with examples.	CO-4	L3
6.	Explain the role of packages <code>data.table</code> and <code>dplyr</code> in handling big datasets with example.	CO-5	L5

SECTION-C			
7.	Explain the importance of R as a calculator with other programming languages.	CO-1	L5
8.	Identify types of continuous probability distribution with example in R.	CO-3	L3
9.	Analyze types of regression models in R and its specific roles.	CO-4	L4

Note: Disclosure of identity by writing mobile number or making of passing request on any paper of Answer Sheet will lead to UMC against the student.

Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (CSE), Semester-5th
SOFTWARE ENGINEERING

Subject Code: BTCS 503 -18

M.Code: 78322

Date of Examination: 22-5-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. **SECTION C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What is the difference between verification and validation?	CO-1	L1
b.	Illustrate the use of E-R diagram with the help of an example.	CO-1	L2
c.	Define the term Cohesion in context of Software Design.	CO-2	L1
d.	Outline the importance of coding standards in software development.	CO-2	L2
e.	Recall the terms Stub and Driver in context of Software Testing.	CO-3	L1
f.	Explain the importance of software reliability metrics in project management.	CO-3	L2
g.	List any two drawbacks of cost estimation models	CO-4	L1
h.	Discuss the role of project planning in ensuring successful software delivery.	CO-4	L2
i.	Define ISO in context of software quality.	CO-5	L1
j.	Compare different types of software reuse.	CO-5	L2
SECTION-B			
2.	Identify feasibility issues in developing an e-commerce system.	CO-1	L3
3.	Analyze the effectiveness of a DFD for a restaurant order processing system, identifying potential ambiguities in data flows or processes and suggesting refinements.	CO-2	L4
4.	Compare black-box and white-box testing strategies with practical examples.	CO-3	L5
5.	Construct Work Breakdown Structure (WBS) for an ERP project.	CO-4	L4



6.	Explain the role of PSP and Six Sigma in improving Software development Quality.	CO-5	L5
SECTION-C			
7.	Compare different types of cohesion and their role in modularity by giving suitable examples.	CO-2	L4
8.	Examine the role of early testing in reducing software development cost.	CO-3	L4
9.	A project size of 200 KLOC is to be developed. Consider the cost drivers given below: • Programming language experience = 1.07 • Product complexity = 0.85 • Use of software tools = 1.10 Estimate effort, development time and average staff size using COCOMO.	CO-4	L5

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8.	Choose three data acquisition techniques and utilize their roles in IoT remote monitoring for a smart water quality system.	CO-3	L3
9.	Explain the importance of IoT in home automation for developing a smart thermostat control system and its impact on project usability.	CO-4	L5

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Total No. of Pages: 2

Total No. of Questions: 09

B.Tech (CSE), Semester 5th
PROGRAMMING IN PYTHON

Subject Code: BTCS 510-18

M Code: 78324

Date of Examination: 25-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What is the name of the list in "sys" module that stores command line arguments?	CO-1	L1
b.	Illustrate with an example how a dictionary stores data in key-value pairs.	CO-1	L2
c.	Which block of code is always executed, whether an exception occurs or not?	CO-2	L1
d.	Explain with an example the difference between "a" mode and "w" mode when writing to a file.	CO-2	L2
e.	Define multithreading in programming.	CO-3	L1
f.	Explain with an example how re.findall() works differently from re.search().	CO-3	L2
g.	Illustrate the terms Tkinter and PyQt.	CO-4	L1
h.	Explain the concept of widget hierarchy in Tkinter.	CO-4	L2
i.	Which DB-API function is used to connect to a database?	CO-5	L1
j.	Outline two differences between a database and a spreadsheet.	CO-5	L2
SECTION-B			
2.	Identify the concept of file system and file execution in python.	CO-1	L3
3.	Analyze two approaches of command line input and suggest which is better for scalability for developer and use sys.argv or argparse for handling command-line inputs in a large project.	CO-2	L4
4.	Explain the related modules used for concurrency in Python: thread, threading, multiprocessing, queue, and asyncio. Compare their use cases with examples.	CO-3	L5
5.	Examine the structure of a Tkinter-based GUI application and identify the role of widgets, layout managers, and event loops.	CO-4	L4
6.	Evaluate the role of CGI in web programming. Also inspect how Python helps in processing client data.	CO-5	L5

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SECTION-C			
7.	Simplify the concept of exception detection in python with suitable example.	CO-1	L4
8.	Identify the role of Global Interpreter Lock (GIL) in Python. Discuss its working, limitations in CPU-bound programs, and possible workarounds with examples.	CO-3	L3
9.	Explain how error handling and exception management in Python web applications affect overall reliability and user satisfaction.	CO-4	L5

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Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (AIML/AIDS/ IOT/CSE-DS), Semester 5th

PROGRAMMING IN PYTHON

Subject Code: BTAIML 501-20

M.Code: 93173/93939/92370/92344

Date of Examination: 25-05-2025

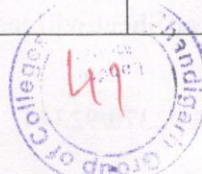
Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. **SECTION C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Explain the role of Python as a high-level programming language in software development.	CO-1	L2
b.	List any two differences between Lists and Tuples.	CO-1	L1
c.	List any two mutable and immutable data types in Python.	CO-2	L1
d.	Explain string slicing in Python with an example.	CO-2	L2
e.	Compare local and global variables.	CO-3	L2
f.	Show the syntax of a lambda function in Python	CO-3	L1
g.	Explain the role of the finally block in exception handling.	CO-4	L2
h.	Explain the role of <code>__init__</code> in designing Python classes.	CO-4	L2
i.	Compare 'OrderedDict' and a normal dictionary.	CO-5	L2
j.	Demonstrate a program using datetime to check whether a given year is a leap year.	CO-5	L2
SECTION-B			
2.	Build a Python program that accepts the radius of a circle, computes & prints the area, circumference and diameter of the circle. Also demonstrates the use of variables and expressions.	CO-1	L3
3.	Explain the importance of strings in Python as a sequence data type and also explain how string slicing and built-in methods assist in text manipulation and processing.	CO-2	L5
4.	Apply your understanding of user-defined functions to describe their role in program modularity. Identify how defining reusable functions helps reduce redundancy and enhances maintainability of large applications.	CO-3	L3



5.	Explain the concept of Object-Oriented Programming (OOP) in Python with focus on classes and objects. Determine how attributes and methods are defined, accessed, and modified.	CO-4	L5
6.	Analyse the role of the <i>any()</i> and <i>all()</i> functions in validating input forms for an online banking application and justify which function would provide stronger error checking.	CO-5	L4
SECTION-C			
7.	Apply Python's operators to develop a program that calculates and prints the output net salary of an employee by deducting HRA (20%), DA (10%), and tax (10%). Consider input basic salary as Rs. 80,000.	CO-1	L3
8.	Explain the concept of function arguments in Python by using the default arguments, keyword arguments, and variable-length arguments and write a well-structured Python program to illustrate how each type of argument behaves during function calls	CO-3	L5
9.	Analyse the benefits and challenges of using Inheritance, encapsulation and abstraction in Python classes by writing the code for these concepts. Examine how these OOP concepts contribute to software security and data integrity.	CO-4	L4

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Roll No.

Total No. of Pages:02

Total No. of Questions: 09

B.Tech (CSE), Semester 5th

WEB TECHNOLOGIES

Subject Code: BTCS-520-18

M.Code: 78326

Date of Examination: 25-05-2026

Time: 3 Hrs.**Max. Marks: 60**

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	List the differences between IPv4 and IPv6 addressing	CO-1	L1
b.	Interpret a secure web communication system using a proxy server to improve data protection?	CO-1	L2
c.	What is the use of the ` <iframe>` tag?&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;CO-2&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;L1&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;/tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;d.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;Summarize the types of lists in HTML.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;CO-2&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;L2&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;/tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;e.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;Write two text formatting properties in CSS.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;CO-3&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;L1&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;/tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;f.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;Give two examples of arithmetic operators in JavaScript and describe their use.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;CO-3&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;L2&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;/tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;g.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;Describe how push() and pop() methods work in arrays.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;CO-4&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;L2&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;/tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;h.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;Explain definitions of cookies and sessions in web development.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;CO-5&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;L2&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;/tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;i.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;Describe why cookies are important for maintaining user sessions?&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;CO-6&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;L2&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;/tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;j.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;List down the advantages and disadvantages of AJAX.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;CO-6&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;L1&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;/tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td colspan="4"&amp;amp;amp;amp;gt;SECTION-B&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;/tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;2.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;Examine the five services provided by ISPs in detail.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;CO-1&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;L4&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;/tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;3.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;Identify event handling in JavaScript and create a simple example showing how an event triggers a function?&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;CO-2&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;L3&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;/tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;4.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;Justify and explain how a web form is processed at the server side?&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;CO-3&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;L5&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;/tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;5.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;Determine the use of 'var', 'let', and 'const' in JavaScript and explain which one is suitable for dynamic page creation.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;CO-4&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;L5&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;/tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;6.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;Develop a small web-based application that uses JSON to load and display student information dynamically.&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;CO-6&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;td&amp;amp;amp;amp;gt;L3&amp;amp;amp;amp;lt;/td&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;/tr&amp;amp;amp;amp;gt;&amp;amp;amp;amp;lt;/table&amp;amp;amp;amp;gt;</iframe>		

SECTION-C			
7.	Construct a system architecture for a secure web service accommodating multiple users with different access levels.	CO-1	L3
8.	Evaluate the impact of JavaScript object-oriented programming on dynamic page creation. Assess how concepts like objects, classes, and methods contribute to modular, maintainable, and interactive web applications.	CO-4	L4
9.	Build a PHP dashboard that dynamically displays data from a MySQL database using AJAX for real-time updates. Explain how your design improves performance and user interaction.	CO-5	L6

Note: Disclosure of identity by writing mobile number or making of passing request on any paper of Answer Sheet will lead to UMC against the student.

Total No. of Pages: 02

Total No. of Questions: 09

B. Tech (AIDS), Semester 5th
CLOUD COMPUTING TECHNOLOGIES

Subject Code: BTAIDS501-20

M.Code:93949

Date of Examination: 01/06/2026

Time: 3 Hrs.

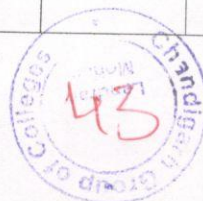
Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define grid computing with example.	CO1	L1
b.	Outline two differences between parallel and distributed computing.	CO1	L2
c.	List any two benefits of storage virtualization.	CO2	L1
d.	How do cloud service models support different user requirements?	CO2	L1
e.	Explain the difference between stateful and stateless load balancing.	CO2	L2
f.	Compare AWS Region and Availability Zone.	CO3	L2
g.	Outline the purpose of a Content Delivery Network (CDN).	CO3	L2
h.	Define Google cloud region with example.	CO4	L1
i.	Recall the difference between Azure Region and Availability Zone.	CO5	L1
j.	Classify Blob Storage and Disk Storage with example.	CO5	L2
SECTION-B			
2.	Make use of suitable example to show how computing evolved from centralized systems to distributed systems.	CO1	L3
3.	Determine the limitations of cluster computing when deployed in cloud-based environments.	CO2	L5
4.	Analyze the role of server, storage and network virtualization in improving scalability in IaaS	CO3	L4

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5.	Discover the design principles of Google Bigtable and inspect how they enable large-scale, low-latency data processing.	CO4	L4
6.	Evaluate the cost, scalability, and management trade-offs involved in selecting Azure compute and storage services for a cloud-native application.	CO5	L5
SECTION-C			
7.	“Parallel and distributed computing models can be applied to accelerate scientific simulations.” Justify the statement with suitable real-world example.	CO2	L5
8.	Construct various architectural system models employed in distributed and cloud computing environments, including the client-server model, peer-to-peer (P2P) model and hybrid model.	CO3	L3
9.	Examine how Identity and Access Management and threat detection mechanisms are integrated within Google Cloud Security Command Center to enhance overall cloud security.	CO5	L4

NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the student.

Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (CSE/AIDS/AIML/IOT/CSE-DS), Semester 5th
FORMAL LANGUAGE AND AUTOMATA THEORY

Subject Code: BTCS502-18

M.Code: 78321/93172/93938/92360/92343

Date of Examination: 14-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What is a formal language and how it is different from natural languages ?	CO-1	L1
b.	Explain how a grammar(G) is represented in formal language theory.	CO-1	L2
c.	What is the difference between Regular and context free grammar?	CO-2	L1
d.	Explain Arden's theorem.	CO-2	L2
e.	Recall Chomsky's Normal Form. Give an example.	CO-3	L1
f.	Demonstrate that the given grammar is ambiguous. $S \rightarrow a \mid Sa \mid bSS \mid SSb \mid SbS$	CO-3	L2
g.	Outline the restrictions on tape movement in a LBA.	CO-4	L2
h.	Compare and contrast Finite Automata with Turing Machines.	CO-5	L2
i.	Explain Cook-Liven theorem.	CO-6	L2
j.	When is a problem said to be NP-hard?	CO-6	L1
SECTION-B			
2.	Identify the language $L=\{a^ncb^n \mid n \geq 1, \text{ over alphabet } \Sigma = \{a, b, c\}\}$ as per Chomsky hierarchy.	CO-1	L3
3.	Examine the pumping lemma for regular grammars and infer how it can be applied to prove that a given grammar is not regular.	CO-2	L4
4.	Evaluate the following CFG and simplify it into Chomsky Normal Form (CNF): $S \rightarrow *S$ $S \rightarrow (S*S)$ $S \rightarrow 1$ $S \rightarrow 2$	CO-3	L5
5.	Construct a CSG for the language $L=\{a^nb^nc^n \mid n \geq 1\}$. Apply the rules of CSGs to derive the string "aabbcc" for the language.	CO-4	L6
6.	Identify the validity of the Church-Turing Thesis in modern computation models.	CO-6	L3

SECTION-C			
7.	Identify the automata machines that accept different languages according to the Chomsky hierarchy.	CO-1	L3
8.	Build a LBA for language L having equal number of a's followed by equal number of b's followed by equal number of c's.	CO-4	L3
9.	Evaluate the operations of a Turing Machine in terms of reading and writing symbols on the tape, state transitions and halting conditions with suitable example.	CO-5	L5

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Total No. of Questions: 07

B.Sc. (CS)/B.Sc. (AIML), Semester-5th

CLOUD COMPUTING

Subject Code: UGCA1936

M.Code:94071

Date of Examination: 13-05-2026

Time: 3 Hrs.

Max. Marks:60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B consists of SIX questions, carrying TEN marks each and students have to attempt any FOUR questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Give any two challenges ahead in cloud computing.	CO-1	L1
b.	Explain any two benefits of cloud migration for organizations.	CO-1	L2
c.	Describe the concept of distributed computing in cloud computing.	CO-1	L2
d.	Define the term "migration strategy" in cloud computing	CO-2	L1
e.	Classify Broad Approaches to Migrating into the cloud.	CO-2	L2
f.	Compare the working of cluster computing and cloud computing.	CO-2	L2
g.	List any two approaches to cloud migration.	CO-3	L1
h.	Outline any two pros and cons of virtualization.	CO-3	L2
i.	What is the purpose of Microsoft Hyper-V?	CO-4	L1
j.	Interpret the purpose of the system metrics.	CO-4	L2
SECTION-B			
2.	Identify the components and characteristics of distributed computing in detail.	CO1	L3
3.	Explain the various types of virtualizations, providing a detailed explanation and a real-world example for at least four types.	CO1	L5
4.	Simplify cloud migration and generalize the steps model of migration into a cloud.	CO2	L3
5.	Classify Hypervisor Technology Examples- Xen, VMware, Microsoft Hyper-V.	CO3	L4
6.	List the advantages and disadvantages of virtualization in business organizations, with suitable examples.	CO3	L4
7.	Determine the purpose of Google App Engine (GAE) with its five main features.	CO4	L5

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Total No. of Questions: 09

DATABASE MANAGEMENT SYSTEMS

Subject Code: - BTCS 501-18

M.Code: - 78320/93171/93937/92359/92342

Date of Examination: 09-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION-B contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. SECTION C contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define integrity constraints.	CO-1	L1
b.	Explain the role of Data Definition Language (DDL).	CO-1	L2
c.	List the key features of a network data model.	CO-2	L1
d.	Explain the entity-relationship (ER) model.	CO-2	L2
e.	List two objectives of storage management.	CO-3	L1
f.	Explain why B-trees are preferred in databases.	CO-3	L2
g.	List two techniques used for access control.	CO-4	L1
h.	Compare single-factor and multi-factor authentication.	CO-4	L2
i.	Define database security.	CO-5	L1
j.	List two features of object-oriented databases.	CO-5	L2
SECTION-B			
2.	Examine logical and physical data independence with suitable examples.	CO-1-	L4
3.	Apply SQL DDL and DML statements for creating and updating a table.	CO-2	L3
4.	Evaluate the significance of concurrency control in multi-user systems.	CO-3	L5
5.	Analyze how access control mechanisms help in reducing insider threats within an organization.	CO-4	L4
6.	Determine how distributed database architectures improve performance and reliability compared to centralized systems.	CO-5	L5

SECTION-C			
7.	Simplify the ER diagram of a library system and map it into a relational schema clearly categorizing the relations, attributes, primary keys and foreign keys.	CO-1	L4
8.	Explain ACID properties with examples.	CO-3	L4
9.	Evaluate how DAC, MAC, and RBAC models can be used to design an effective authentication and authorization system for database security.	CO-4	L5

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Total No. of Pages: 01

B.Sc. (AIML), Semester-5th

Subject Code: UGCA1989

Date of Examination: 06-05-2026

Max. Marks: 60

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	List any two characteristics of neural networks	CO1	L1
b.	Explain gradient descent algorithm.	CO1	L2
c.	Define the concept of multilayer perceptron (MLP).	CO2	L1
d.	State the concept of Mexican Hat network.	CO3	L1
e.	Explain the importance of backpropagation in training a multilayer perceptron.	CO2	L2
f.	Describe the use of Principal Component Analysis (PCA) for dimensionality reduction.	CO4	L2
g.	What is a radial basis function (RBF) network?	CO4	L1
h.	Explain the concept of interpolation in radial basis function (RBF) networks.	CO5	L2
i.	Classify how self-organizing maps (SOM) perform clustering.	CO3	L2
j.	Explain cooperative process in SOM.	CO3	L2
SECTION-B			
2.	Analyze the role of Principal Component Analysis in dimensionality reduction and data preprocessing.	CO4	L4
3.	Evaluate the importance of gradient descent Algorithm in training neural networks with suitable examples.	CO1	L5
4.	Explain self-organizing maps (SOM) in comparison with other clustering techniques.	CO3	L5
5.	Apply the artificial neuron model to show how linear regression can be implemented using neural networks.	CO1	L3
6.	Classify the concept of linear separability and its limitations using perceptron models.	CO2	L4
7.	Construct the performance differences between multilayer perceptron and radial basis function networks.	CO5	L3

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Total No. of Pages: 01

Total No. of Questions: 07

Bachelor of Science (Cyber Security), Semester- 5th

LINUX OPERATING SYSTEM

Subject Code: UGCA2021

M. Code: 94068

Date of Examination: 06-05-2026

Time: 3 Hrs.,

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** consists of **SIX** questions, each carrying **TEN** marks each and student has to attempt any **FOUR** questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Summarize the components of the Linux file structure.	CO1	L2
b.	Define the need of sudo commands with syntax and suitable example.	CO2	L2
c.	What is virtualization in Linux operating system?	CO3	L1
d.	Write about backup management in Linux operating system.	CO5	L1
e.	Define the meaning and purpose of shell initialization in Linux.	CO3	L1
f.	Differentiate between absolute and relative path while referring to files in Linux.	CO3	L2
g.	Define the kernel and its functions in the Linux.	CO4	L1
h.	List four commands for managing files in Linux operating system.	CO1	L1
i.	Compare user-level and system-level configuration files.	CO4	L2
j.	State the available network services that are used in Linux.	CO5	L2
SECTION-B			
2.	Explain the role of aliases, filename expansion and pipes in Linux.	CO5	L5
3.	Identify the component used in structure of Linux operating system with diagram.	CO1	L3
4.	Write programs by taking input from the user and add proper comments for : (a) Fibonacci series using for loop. (b) Simple calculator using if or case.	CO2	L3
5.	Explain with their purpose, features, and differences: (a) The X Window System. (b) GNOME Desktop Environment. (c) KDE Desktop Environment. (d) Desktop operations in Linux.	CO4	L5
6.	Distinguish: (a) if & case (b) for & while using suitable shell script example.	CO3	L4
7.	Examine the relationship between package managers, repositories, and dependencies in Linux.	CO5	L4

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Roll No.

Total No. of Pages:01

Total No. of Questions: 07

B.Sc -(DATA ANALYTICS)(Semester-5th)

WEB DESIGNING

Subject Code: UGCA1927

M.Code: 94080

Date of Examination: 06.05.26

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

3. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
4. **SECTION-B** consists of **SIX** questions, each carrying **TEN** marks each and the student has to attempt any **FOUR** questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Explain Internet Service Provider.	CO1	L2
b.	What is an IP address?	CO1	L1
c.	Write the definition of URL.	CO2	L1
d.	Define datatypes in JavaScript .	CO4	L1
e.	Show the use of Images As Hyperlinks in HTML.	CO3	L2
f.	Compare ROWSPAN and COLSPAN in table tags.	CO2	L2
g.	Explain how database connectivity is performed in JavaScript.	CO4	L2
h.	How images are used as hyperlink?	CO3	L1
i.	Explain Core Language objects with example.	CO5	L2
j.	What are radio buttons in HTML forms?	CO5	L1
SECTION-B			
2.	Examine an HTML file with JavaScript that generates a table of numbers from 5 to 15 along with their squares using alert.	CO4	L4
3.	Explain Internet Domain and Internet Server Identities.	CO1	L5
4.	Build a page that includes links to different sections of the same page and other web pages.	CO3	L3
5.	Compare inline, internal, and external Cascading Style Sheet to style a webpage with example.	CO2	L4
6.	Explain the importance of the various form elements available.	CO5	L5
7.	Make use of functions and Control statements in JavaScript with example.	CO4	L3

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Roll No.

Total No. of Pages: 2

Total No. of Questions: 09

B.Tech CSE 10th Semester-5th

INFORMATION THEORY AND CODING

Subject Code: BTES 504-20

M.Code: 92358

Date of Examination: 05-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What is the unit of information in Information Theory?	CO-1	L1
b.	Illustrate Shannon's theorem of channel capacity with the help of a clear explanation.	CO-1	L2
c.	How would you define a linear block code in error detection and correction in communication systems?	CO-2	L1
d.	Summarize the probability of an undetected error in block coding.	CO-2	L2
e.	Define cyclic codes and how they are different from general linear block codes?	CO-3	L1
f.	Explain the error-trapping decoding technique used specifically for cyclic codes.	CO-3	L2
g.	List the different types of convolutional decoders distinguishing features of each type.	CO-4	L1
h.	Compare block codes with convolutional codes, highlighting their structure and decoding.	CO-4	L2
i.	What are BCH codes designed to provide powerful error-correcting capabilities?	CO-5	L1
j.	Compare BCH codes with general cyclic codes, explaining the additional advantages of BCH.	CO-5	L2
SECTION-B			
2.	Analyze the concept of entropy in Information Theory and discover why it is regarded as a fundamental measure of uncertainty.	CO-1	L4
3.	Model the process of syndrome decoding in error correction, and solve the method with the help of a suitable example.	CO-2	L3

4.	Explain the concept of shortened cyclic codes with an example and discuss their advantages.	CO-3	L5
5.	Examine maximum likelihood decoding using the Viterbi algorithm for the received sequence 110 101 011 in rate 1/2 convolutional encoder with Constraint length, $K=3$, $g_1=(1,1,1)$, $g_2=(101)$ and input as 1011.	CO-4	L4
6.	Perceive minimum Hamming distance of a code and explain its role in error detection and correction.	CO-5	L5
SECTION-C			
7.	Develop the mathematical expression for entropy and average information and inspect how these expressions quantify the uncertainty and information content of a source.	CO-1	L4
8.	Inspect the error-trapping decoding method for cyclic codes and analyze how this technique is applied to detect and correct burst errors in transmitted data.	CO-3	L4
9.	Interpret the corresponding state diagram for a rate 1/2 convolutional code with constraint length $K=3$ and generator polynomials $g_1=(1,1,1)$, $g_2=(1,0,1)$. Encode the input sequence 101110111011.	CO-4	L5

Note: Disclosure of identity by writing mobile number or making of passing request on any paper of Answer Sheet will lead to UMC against the student.

Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (AIDS/AIML/CSE-DS), Semester-5th

ARTIFICIAL INTELLIGENCE

Subject Code: BTAIML 502-20

M.Code: 93940/93174/92345

Date of Examination: 05-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What is the primary goal of a problem-solving agent?	CO-1	L1
b.	Contrast a model-based reflex agent with a simple reflex agent.	CO-1	L2
c.	Define a search tree.	CO-2	L1
d.	Explain the role of Search Tree in Problem solving.	CO-2	L2
e.	List two knowledge representation schemes used in AI.	CO-3	L1
f.	Explain why the "Frame Problem" is a significant issue for representing dynamic worlds.	CO-3	L2
g.	Recall the primary goal of 'Learning by taking advice'.	CO-4	L1
h.	Contrast Rote Learning with "Learning from Examples".	CO-4	L2
i.	When is Knowledge Acquisition performed in the Expert System development process?	CO-5	L1
j.	Classify the types of knowledge representation methods used in expert systems.	CO-5	L2
SECTION-B			
2.	Examine the A* algorithm's optimality proof and why the algorithm is only optimal if the heuristic function $h(n)$ is admissible.	CO-1	L4
3.	Develop a plan to apply forward chaining in a medical expert system.	CO-2	L3
4.	Critique the following statement: "Inheritance in frame systems is an efficient solution for managing hierarchical knowledge."	CO-3	L5
5.	Dissect the role of "near misses" in Winston's learning program and why they are considered more informative than negative examples.	CO-4	L4

6.	Justify whether expert systems can replace human experts in critical fields like medicine.	CO-5	L5
SECTION-C			
7.	Analyze how heuristics techniques can help reduce computational complexity in large problem spaces.	CO-1	L4
8.	Examine how the Frame Problem affects knowledge representation in AI.	CO-3	L4
9.	Evaluate the use of Decision Trees as a tool for building fair and transparent AI systems. Prove that a transparent model that shows its bias better or worse than a black-box model that might hide it?	CO-4	L5

Note: Disclosure of identity by writing mobile number or making of passing request on any paper of Answer Sheet will lead to UMC against the student.

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Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (CSE), Semester 5TH

ENTERPRISE RESOURCE PLANNING

Subject Code: - BTES 501-18

M.Code: - 78319

Date of Examination: 05-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define Enterprise Resource Planning (ERP).	CO-1	L1
b.	Outline the main strategies to consider before starting ERP implementation.	CO-1	L2
c.	Define Data Warehousing.	CO-2	L1
d.	Demonstrate the role of business consultants.	CO-2	L2
e.	What is Quality planning and quality inspection?	CO-3	L1
f.	Explain the main functions of the Finance module in an ERP system.	CO-3	L2
g.	Who are stakeholders in an enterprise?	CO-4	L1
h.	Explain two common problems that companies face when working with vendors.	CO-4	L2
i.	Define ERP and Internet in one sentence.	CO-5	L1
j.	Interpret the importance of ERP and Internet in real-time data sharing.	CO-5	L2
SECTION-B			
2.	Analyze the key components and functions that define an Enterprise Resource Planning (ERP) system.	CO-1	L4
3.	Apply ERP modules to explain how they streamline supply chain management.	CO-2	L3
4.	Explain the role of Market Risk Management in an ERP finance system.	CO-3	L2



5.	Examine how PeopleSoft, Oracle, and SAP address different business needs through their ERP solutions.	CO-4	L4
6.	Examine how ERP connects with an e-commerce platform and describe the data flow between the front end and the back end.	CO-5	L4
SECTION-C			
7.	Classify any three ERP modules and explain their interrelationships, and compare as well.	CO-1	L4
8.	Analyze the sales-related business transactions and examine how each function contributes to the overall sales order processing workflow.	CO-3	L4
9.	Evaluate the role of telecommunications in building integrated ERP solutions.	CO-4	L5

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Roll No.

Total No. of Pages: 01

Total No. of Questions: 07

B.Sc - Data Analytics, Semester-5th (Br Tech)

COMPUTER NETWORK

Subject Code: UGCA1913

M.Code: 94087

Date of Examination: 30-04-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B consists of SIX questions, carrying TEN marks each and students have to attempt any FOUR questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Define message switching in data communication.	CO1	L1
b.	Explain the functions of the network layer in communication.	CO1	L2
c.	Name the common standards used in LAN technologies.	CO2	L1
d.	Describe the role of flow control in congestion prevention.	CO2	L2
e.	What is Hybrid topology in computer networks?	CO3	L1
f.	Compare leased line and switched line based on their characteristics.	CO3	L2
g.	State any two design issues of the Transport layer in networking.	CO4	L2
h.	Why is UDP called a connectionless protocol in networking?	CO4	L1
i.	List the functions of HTTP in web communication.	CO5	L1
j.	Describe Remote Procedure Call (RPC) in distributed systems.	CO5	L2
SECTION-B			
2.	Apply the leaky bucket and token bucket algorithms in congestion control with suitable illustrations.	CO1	L3
3.	Classify the role of data link layer protocols like PPP in reliable transmission with relevant features.	CO2	L4
4.	Explain congestion in the transport layer with its causes, effects, and control techniques.	CO4	L5
5.	Justify the selection of star or mesh topology for a small business network with appropriate comparison and reasoning.	CO3	L5
6.	Identify the concept of connection release in TCP with stages of graceful session termination.	CO4	L3
7.	Break down the hierarchical structure of the Domain Name System (DNS) with the process of domain name resolution.	CO5	L4

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1|M- 94087



Roll No.

Total No. of Pages:01

Total No. of Questions: 07

B.Sc. (AIML), Semester- 5th

R Programming

Subject Code: UGCA1946

M.Code: 92411

Date of Examination: 30-04-2026

Time: 3 Hrs.

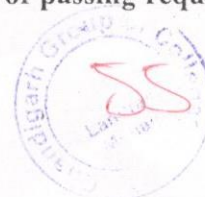
Max. Marks:60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Why is R called a dynamically typed language?	CO-1	L1
b.	Describe the generic functions in R.	CO-1	L2
c.	Rewrite the syntax of plot() function.	CO-2	L2
d.	What is the purpose of graphics in R?	CO-2	L1
e.	Outline the purpose of boxplot() in R.	CO-2	L2
f.	State the purpose of the byrow = TRUE argument in the matrix() function.	CO-3	L1
g.	How can you delete and add rows in a matrix?	CO-3	L1
h.	Classify how to access the element in the 2nd row and 3rd column of a matrix.	CO-3	L2
i.	Write syntax to create a factor from a character vector.	CO-4	L1
j.	Explain the functions you can use to take the input from the users in R.	CO-4	L2
SECTION-B			
2.	Write an R program to create an S3 class student with attributes like name, marks, and grade.	CO1	L3
3.	Differentiate the R code used to generate a histogram, bar plot, and boxplot.	CO2	L4
4.	Utilize the R program to simulate random numbers using rnorm().	CO1	L3
5.	Classify the structure and operations of vectors in R with suitable code.	CO3	L4
6.	Evaluate a R program that creates two matrices and performs addition, subtraction, and multiplication operations.	CO3	L5
7.	Explain the role of factors and tables in data analysis. Write programs demonstrating creation, modification of factors and tables.	CO4	L5

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Roll No.

Total No. of Pages: 01

Total No. of Questions: 07

B.Sc.(CS), Semester-5th

ADVANCED WEB TECHNOLOGIES

Subject Code: UGCA2019

M.Code: 94063

Date of Examination: 30-04-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Define PHP and the basic syntax to display the values in PHP.	CO-1	L1
b.	Differentiate between GET and POST methods in PHP.	CO-1	L2
c.	What is inheritance in PHP OOP?	CO-2	L1
d.	Describe the steps required to display MySQL data in an HTML table using PHP.	CO-2	L2
e.	What is a cookie in web development?	CO-3	L1
f.	Compare the working of echo and print in PHP.	CO-3	L2
g.	Illustrate how the jQuery Datepicker widget is used with a small example. <pre><input type="text" id="date"> <script> \$("#date").datepicker(); </script></pre>	CO-4	L2
h.	Describe Bootstrap grid system with a simple example.	CO-5	L2
i.	Explain two features of Node.js.	CO-6	L2
j.	Define JSX in React along with its purpose.	CO-6	L1
SECTION-B			
2.	Build a PHP script that uses numeric functions to perform statistical operations like average, maximum, minimum, and standard deviation.	CO1	L3
3.	Dissect a PHP script that reads data from a text file and displays it in an HTML table, highlighting each step of data processing.	CO2	L4
4.	Explain the advantages of web services and justify their importance in modern distributed applications.	CO3	L5
5.	Explain XML elements and attributes, and assess their importance in structuring XML documents with suitable examples.	CO4	L5
6.	Develop a form in React and apply event handling techniques to solve user input validation problems.	CO5	L3
7.	List the components of Bootstrap and their functions in designing responsive web pages.	CO6	L4

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1|M- 94063



Roll No.

Total No. of Questions: 9

Date : 19-05-2026
Total No. of Pages: 2B.Tech(AIDS / CSE-DS), Semester-6th
Subject Name: DATA ANALYTICS USING R
Subject Code: BTITCS 601-20
M. Code: 93954 / 93378

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
a.	Write the types of Data Analytics with an example for each.	CO-1	L1	2
b.	Outline the steps involved in Data Analytics lifecycle.	CO-1	L2	2
c.	State the basic features of R programming.	CO-2	L1	2
d.	Interpret the output of the 'length()' and 'str()' functions when applied to a vector of five elements.	CO-2	L2	2
e.	What is the use of bar charts in comparing categories?	CO-3	L1	2
f.	Summarize the steps required to fetch data from a live Web URL using R.	CO-3	L2	2
g.	List the functions used to implement Normal Distribution in R.	CO-4	L1	2
h.	State packages and functions used to implement Decision Tree in R.	CO-4	L2	2
i.	Define reward in reinforcement learning.	CO-5	L1	2
j.	Describe the process of creating data through designed experiments.	CO-5	L2	2
SECTION B				20
2.	Select any four tools for data analytics and utilize them on the steps from "Collecting Data" to "Gaining Knowledge."	CO-1	L3	5
3.	Classify the conditional statements in R with an example for each.	CO-2	L4	5
4.	Justify the use of scatterplot and line graph for different applications with suitable examples for each.	CO-3	L5	5
5.	Use Survival Analysis in a real-life applications and identify its importance with an example.	CO-4	L3	5
6.	Explain the concept of Prescriptive Analytics and discuss its role in decision-making with different real time examples.	CO-5	L5	5
SECTION C				20
7.	Identify the usage of Arrays, Vectors and Factors data structure in data analysis. Develop a R script to demonstrate the usage of each.	CO-2	L3	10
8.	Explain how different types of statistical techniques can be performed and implemented in R with suitable examples.	CO-4	L5	10
9.	Explain the Characteristics of Data. Decide whether "Veracity" is more important than "Volume" for a bank and justify your answer.	CO-1	L5	10

Roll No.

Total No. of Questions: 9

Date : 19-05-2026
Total No. of Pages: 2B.Tech- CSE(IOT), Semester-6th
Subject Name: NETWORK SECURITY AND CRYPTOGRAPHY
Subject Code: BTCS-701-18 E2
M. Code : 93411

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

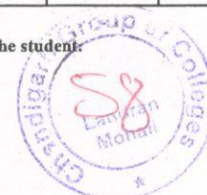
SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
a.	List four general categories of attack.	CO-1	L1	2
b.	Describe the term Security services in Network Security.	CO-1	L2	2
c.	What is the formula for Euler's Totient Function if p is a prime number.	CO-2	L1	2
d.	Relate the concept of modular arithmetic to the "Clock Math" analogy.	CO-2	L2	2
e.	Name the two keys used in RSA algorithm.	CO-3	L1	2
f.	Illustrate the vulnerability of "Double DES" to the Meet-in-the-Middle attack.	CO-3	L2	2
g.	List properties of MAC with example.	CO-4	L1	2
h.	State the requirements of a digital signature.	CO-4	L2	2
i.	Define access control with an example.	CO-5	L1	2
j.	Summarize the design goals of firewalls.	CO-5	L2	2
SECTION B				20
2.	Choose effective security mechanisms to protect a corporate network and their effectiveness against unauthorized access and attacks.	CO-1	L3	5
3.	Analyze the importance of modular arithmetic in cryptography for creating secure keys and performing encryption and decryption operations.	CO-2	L4	5
4.	Apply key management techniques to securely generate, distribute, and store cryptographic keys in a multi-user network environment.	CO-3	L3	5
5.	Determine the suitability of SHA algorithms for secure data transmission in current systems.	CO-4	L5	5
6.	Evaluate intrusion detection systems (IDS) in terms of functionality and performance. Compare anomaly-based and signature-based IDS techniques.	CO-5	L5	5
SECTION C				20
7.	Solve for the Greatest Common Divisor (GCD) of 480 and 150 using the Euclidean Algorithm. Identify each division step and model the process using a remainder table.	CO-2	L3	10
8.	Analyze the combined role of hash functions and MACs in communication security. (a) Examine integrity assurance. (b) Examine authentication mechanism. (c) Analyze data protection. (d) Analyze attack prevention.	CO-4	L4	10
9.	Determine different network attacks in cloud computing. (a) Determine their impact on data security. (b) Determine mitigation strategies.	CO-5	L5	10

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1915 (M)

Roll No.

Total No. of Questions: 9

Date : 19-05-2026
Total No. of Pages: 8B.TECH(CSE), Semester-6TH
Subject Name: CLOUD COMPUTING
Subject Code: BTCS-612-18

M Code: 79254

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

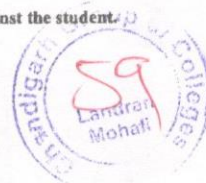
SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
a.	Define the term 'Rapid Elasticity' in the context of cloud computing.	CO-1	L1	2
b.	Explain how cost reduction acts as a driving factor for adopting cloud computing.	CO-1	L2	2
c.	Mention one example each of Type-1 and Type-2 hypervisors.	CO-2	L1	2
d.	Compare vertical scaling (scaling up) and horizontal scaling (scaling out) in terms of how they handle increased workload and resource limitations.	CO-2	L2	2
e.	List two characteristics of SaaS architecture.	CO-3	L1	2
f.	Illustrate the purpose of cloud service models.	CO-3	L2	2
g.	What is the role of API management in a hybrid cloud?	CO-4	L1	2
h.	Compare a Community Cloud with a Private Cloud based on cost and control.	CO-4	L2	2
i.	What is user account and service hijacking in cloud computing?	CO-5	L1	2
j.	Explain the risk of "Shared Responsibility Model" misunderstanding.	CO-5	L2	2
SECTION B				20
2.	Apply the driving factors of cloud computing to explain why an organization should migrate from traditional IT infrastructure to the cloud.	CO-1	L3	5
3.	Distinguish between single-tenant and multitenant architectures, and analyze their suitability for various business scenarios.	CO-2	L4	5
4.	Explain how the 'pay-as-you-go' model of IaaS resources provides a strategic advantage to a startup compared to an established enterprise using an on-premises data centre.	CO-3	L5	5
5.	Apply suitable cloud deployment models to the requirements of an e-commerce business to select the most appropriate option.	CO-4	L3	5
6.	Recommend a comprehensive set of measures to reduce cloud security breaches in an organization for the improvement of overall resilience and protection of cloud-based systems.	CO-5	L5	5
SECTION C				20
7.	Analyze how different virtualization techniques impact system performance and resource utilization.	CO-2	L4	10
8.	Make use of Platform as a Service (PaaS) to develop an application in a cloud computing environment.	CO-3	L3	10
9.	Discuss a framework to compare Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP) based on features, scalability, and service offerings.	CO-5	L6	10

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Roll No.

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Total No. of Pages: 2

Total No. of Questions: 09

B. Teeh (AIML), Semester- 6th**RECOMMENDER SYSTEM**

Subject Code: BTAIML-605-20

M. Code: 93679

Date of Examination: 17-05-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is **COMPULSORY** consisting of TEN questions carrying two marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What is the main goal of a recommender system in modern applications?	CO1	L1
b.	Explain the role of user profiling in recommendation generation.	CO1	L2
c.	Name the essential data sources used in content-based Recommender Systems.	CO2	L1
d.	Compare between explicit and implicit user feedback.	CO2	L2
e.	List various similarity measures used in collaborative filtering.	CO3	L1
f.	Interpret how latent factor model improve recommendations.	CO3	L2

1|M-93679



Q. No.	Question	Course Outcome	Bloom's Level
e.	What is the meaning of 'contextual bandits' in Recommender System?	CO4	L1
h.	Outline how exploration and exploitation balance works in reinforcement learning.	CO4	L1
i.	Define hybridization techniques in Recommender System design.	CO5	L1
j.	Summarize how Tensor Flow aids deep recommender models.	CO5	L1
SECTION-B			
2.	Apply Naïve Bayes and KNN to recommend items, analyze their performance differences.	CO1	
3.	Identify a content-based movie recommender using TF-IDF features and evaluate its results.	CO2	
4.	Judge the impact of regularization and normalization on matrix factorization models.	CO3	
5.	Construct a contextual recommender system that adjusts based on user mood or time.	CO4	
6.	Recommend a deep learning architecture integrating CNN and RNN layers for dynamic Recommender System.	CO5	
SECTION-C			
7.	Analyze a hybrid recommendation system combining demographic and content-based models and analyse scalability issues.	CO2	
8.	Examine matrix completion algorithms and illustrate how gradient descent is applied for rating prediction.	CO3	
9.	Design an adaptive context-aware recommender system integrating reinforcement and transfer learning.	CO4	

NOTE: Disclosure of Identity by writing Mobile No. or Making of passing on any page of Answer Sheet will lead to UMC against the student.

2|M-93679

Roll No. Date : 15-05-2026
Total No. of Pages: 1

Total No. of Questions: 9

B.TECH(CSE IOT), Semester-6TH
Subject Name: DIGITAL FORENSICS
Subject Code: BTITCS-601-20
M. Code : 93412

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
a.	In the context of a criminal investigation where scientific methods are applied to examine evidence, write the purpose of forensic science within the legal justice system.	CO-1	L1	2
b.	State the role of digital evidence in solving cybercrime cases.	CO-1	L2	2
c.	Define the concept of primary memory and give one suitable example.	CO-2	L1	2
d.	Explain the differences in storage behavior among volatile and non-volatile memory	CO-2	L2	2
e.	Write the importance of forensic cloning of digital evidence.	CO-3	L1	2
f.	Describe the reasons why live acquisition may be required in some investigations.	CO-3	L2	2
g.	Define metadata in the context of digital data and information systems.	CO-4	L1	2
h.	Explain the significance of unallocated space in digital forensic investigations.	CO-4	L2	2
i.	Write the definition of data sampling as used in the eDiscovery process.	CO-5	L1	2
j.	Differentiate between technical review and administrative review.	CO-5	L2	2
SECTION B				20
2.	Apply appropriate tools and methods to examine acquired data in a cyber intrusion case and demonstrate their use in the investigation process.	CO-1	L3	5
3.	Analyze the importance of understanding computer organization and storage concepts before performing forensic analysis.	CO-2	L4	5
4.	"Evidence is collected at 10:00 AM, transferred at 12:30 PM, and analyzed at 2:00 PM". Calculate the time gaps and apply chain of custody principles to check whether the evidence handling is proper.	CO-3	L3	5
5.	(a) Explain the techniques used for deleted data recovery. (b) Recommend the most forensically sound recovery approach and justify its applicability in a court-admissible investigation.	CO-4	L5	5
6.	Determine a quality assurance framework for digital forensic investigations, assessing how well it maintains standards and consistency across cases.	CO-5	L5	5
SECTION C				20
7.	a) Apply the concept of FAT and NTFS file systems to compare their features b) Prove why NTFS provides better support for digital forensic investigations.	CO-2	L3	10
8.	A suspect's hard disk contains fragmented files where a file of 12 MB is split into 3 fragments stored at different sectors. The investigator recovers only 8 MB of contiguous data and 2 MB from another fragment. Analyze the impact of fragmentation on evidence recovery and calculate the percentage of the file successfully recovered.	CO-4	L4	10
9.	(a) Interpret the challenges of investigating encrypted web traffic. (b) Justify strategies to overcome these challenges in real-world cybercrime investigations.	CO-5	L5	10

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INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions

Q No.	Description	CO	BL	Marks
SECTION A				20
a.	Write down the characteristics of quality data.	CO-1	L1	2
b.	Interpret slice and dice operation in OLAP with examples.	CO-1	L2	2
c.	Describe a data warehouse along with its characteristics.	CO-1	L2	2
d.	List various tree induction algorithms.	CO-2	L1	2
e.	Outline association rule mining in market basket analysis.	CO-2	L2	2
f.	Describe the role of Dynamic Itemset Counting (DIC).	CO-2	L2	2
g.	What is enterprise search? How does it differ from a general-purpose internet search engine?	CO-3	L1	2
h.	Explain the difference between agglomerative and divisive hierarchical clustering methods with suitable examples.	CO-3	L2	2
i.	List various sources of data for web data mining.	CO-4	L1	2
j.	Outline the significance of the hub-authority model (HITS algorithm) in web structure mining.	CO-4	L2	2
SECTION B				20
2.	Identify the need for a data warehouse in organizational decision making also write various challenges faced in its implementation.	CO-1	L3	5
3.	List and analyze performance evaluation measures for ARM algorithms.	CO-2	L4	5
4.	Explain the difference between partition-based and density-based clustering methods. Given a dataset containing clusters of irregular shapes and some noise points, justify with reasons which method k-means or DBSCAN is more suitable and why. Support your answer with one real-life example of each method.	CO-3	L5	5
5.	Explain web structure mining and describe how hyperlinks between pages are used to determine page importance. What is the difference between in-links and out-links? If page A receives links from 5 highly ranked pages and page B receives links from 6 low ranked pages, which page is more authoritative and why?	CO-4	L5	5
6.	Apply k-means clustering with $k=2$ on the dataset $\{2, 4, 6, 10, 12, 14\}$. Take initial centroids as 2 and 12. Show all iterations until convergence. For each iteration write the clusters formed, recalculate centroids, and state when convergence is reached.	CO-3	L3	5
SECTION C				20
7.	Make use of Naïve Bayes Classification Method and write its working principle, algorithmic steps, and advantages. $P(\text{Spam})=0.5$, $P(\text{Not Spam})=0.5$. $P(\text{Discount} \text{Spam})=0.6$. $P(\text{Discount} \text{Not Spam})=0.2$. Classify an email containing the word "Discount" using Naïve Bayes.	CO-2	L3	10
8.	Analyze the steps involved in PageRank algorithm for web page ranking. $1 \rightarrow 2, 4; 2 \rightarrow 3; 3 \rightarrow 1, 5; 4 \rightarrow 2, 3; 5 \rightarrow 1$, also examine the ranks of these interconnected web pages using the PageRank formula assuming damping factor $d=0.75$ perform upto four iterations.	CO-3	L4	10
9.	Compare ROLAP, MOLAP, and HOLAP architectures in terms of storage, performance, scalability, and use cases also explain OLAP Server Architectures.	CO-1	L5	10

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Roll No.

Total No. of Questions: 9

Date : 15-05-2026
Total No. of Pages: 1B.TECH(AI/ML), Semester-6TH
Subject Name: MACHINE LEARNING
Subject Code: BTCS-619-18
M Code: 93666

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

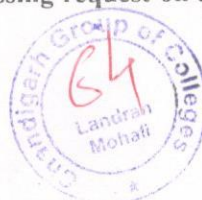
Q No.	Description	CO	BL	Marks
SECTION A				20
a.	How do labeled and unlabeled data contribute to machine learning?	CO-1	L1	2
b.	Outline the concept of unsupervised learning.	CO-1	L2	2
c.	Interpret how Min-Max normalization helps in improving model performance.	CO-2	L1	2
d.	Contrast data transformation and data reduction.	CO-2	L2	2
e.	State the meaning of prediction error and name the measures used in regression..	CO-3	L1	2
f.	State acceptable error in Regression.	CO-3	L2	2
g.	Define the role of decision trees in classification tasks.	CO-4	L1	2
h.	Differentiate between information gain and Gini index in the context of tree induction.	CO-4	L2	2
i.	In a dataset, $\text{support}(A \rightarrow B) = 0.3$ and $\text{support}(A) = 0.5$. Calculate the confidence of rule $A \rightarrow B$.	CO-5	L1	2
j.	Differentiate between various activation functions used in neural networks.	CO-5	L2	2
SECTION B				20
2.	Make use of machine learning model to design a driverless car by outlining the essential stages such as data collection, model training, and real-time decision-making.	CO-1	L3	5
3.	Examine various feature scaling techniques and identify their effects on model performance in different scenarios.	CO-2	L4	5
4.	Critically evaluate multiple linear regression in handling multivariable datasets and justify its applicability in prediction tasks..	CO-3	L5	5
5.	Evaluate the limitations of accuracy as a performance metric in classification models and justify alternative evaluation measures.	CO-4	L5	5
6.	Explain the principles of the Naive algorithm and justify its effectiveness in real-world scenarios.	CO-5	L5	5
SECTION C				20
7.	A student dataset (age, marks, attendance) contains missing values, duplicates, inconsistent formats, and outliers. a)Classify the data issues. b)Design a data cleaning pipeline starting from classification. c)Justify methods used for handling issues. d)Ensure data consistency and validity. e)Explain how you would validate the cleaned data.	CO-2	L3	10
8.	Assume actual values (Y) and predicted values ($\hat{Y}$): Y:10,20,30,40 $\hat{Y}$ (Predicted):8,18,33,37 a) Calculate the Mean Absolute Error (MAE). b) Calculate the Root Mean Square Error (RMSE). c) Analyze the difference between MAE and RMSE. d) Evaluate which error metric shows higher deviation and justify your answer.	CO-3	L4	10
9.	Explain a Genetic Algorithm for solving a real-world optimization problem and justify the choice of encoding, fitness function, and genetic operators.	CO-5	L5	10

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1515 (m)

Max. Marks: 60



Roll No.

Date : 15-05-2024

Total No. of Questions: 7

Total No. of Pages: 2

BSc (AIML), Semester-6th
Subject Name: WEKA- OPEN SOURCE SOFTWARE TOOL
Subject Code: UGCA2014 E2
In-Code : 93689

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
1.a.	State the full form of WEKA and mention its significance in machine learning.	CO-1	L1	2
1.b.	Differentiate any two clustering algorithms available in WEKA based on their working principles.	CO-1	L2	2
1.c.	Name the file formats that can be loaded into WEKA from the local file system.	CO-2	L1	2
1.d.	Describe dataset creation in memory in data mining tools.	CO-2	L2	2
1.e.	State the meaning of numeric attributes in WEKA.	CO-3	L2	2
1.f.	Describe the use of curly braces in sparse ARFF format.	CO-4	L2	2
1.g.	Define association rule mining in data mining.	CO-5	L1	2
1.h.	Interpret the best-first search approach used in attribute selection.	CO-5	L2	2
1.i.	Why are some attributes ignored during clustering?	CO-6	L1	2
1.j.	Interpret the concept of instances in a dataset in the context of data mining.	CO-6	L2	2
SECTION B				40
2.	Write the step-by-step process of installing and launching WEKA on a system and using a simple algorithm to perform data analysis.	CO-1	L3	10
3.	Analyze the role of data preprocessing in WEKA in improving data quality and mining results.	CO-2	L4	10
4.	Explain the advantages and limitations of supervised and unsupervised learning models in handling large-scale datasets.	CO-3	L5	10
5.	Explain the steps required to create and open an ARFF (Attribute-Relation File Format) file in WEKA for data mining tasks.	CO-4	L5	10
6.	Compare the effects of including versus removing irrelevant attributes on the accuracy and complexity of a data mining model, illustrating your answer with relevant scenarios.	CO-5	L5	10
7.	Analyze the effects of excluding certain attributes in WEKA clustering processes and their implications on clustering accuracy and interpretation.	CO-6	L4	10

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Roll No.

Date : 15-05-2020

Total No. of Questions: 7

Total No. of Pages: 2

BSc (Cyber Security), Semester-6th

Subject Name: CYBER ATTACKS

Subject Code: UGCA2049 E2

M-Code: 94327

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
1.a.	Write any two types of Network Vulnerabilities caused by cyber attacks..	CO-1	L1	2
1.b.	Explain the basic concepts of Email Attacks .	CO-1	L2	2
1.c.	Write the purpose of using Firewall in cyber security.	CO-2	L1	2
1.d.	Describe the concept of Asymmetric Cryptography in your own words.	CO-2	L2	2
1.e.	What is the purpose of OpenSSL ?	CO-3	L1	2
1.f.	Explain the concept of digital certificate in cyber work security.	CO-3	L2	2
1.g.	List any two types of Intrusion Detection Systems in cyber security.	CO-4	L1	2
1.h.	Explain the role of message digest(MD) in hash algorithms.	CO-4	L2	2
1.i.	State the concept of Basic authentication protocols.	CO-5	L1	2
1.j.	Outline the main components transport mode in IPSec.	CO-5	L2	2
SECTION B				40
2.	Use the role of attacks in network security with Denial-of-Service (DoS) attacks and Distributed Denial-of-Service (DDoS) with the help of example.	CO-1	L3	10
3.	Differentiate between any two hashing techniques(SH1 and SH2) used for generating message digests in secure communication.	CO-2	L4	10
4.	Justify the role of Data Encryption Standard (DES) in network security with its strengths and weaknesses.	CO-3	L5	10
5.	Compare the different types of Algorithm architectures, highlighting their strengths and weaknesses.	CO-5	L5	10
6.	Explain the process of Firewalls and IDS(intrusion Detection System) with its five features and its diagram.	CO-4	L5	10
7.	Distinguish between digital signatures and message authentication used in security systems with the help of example.	CO-5	L4	10

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Total No. of Pages: 02

B.Tech (AIDS/AIML/CSE DS), Semester 6th

BIG DATA ANALYTICS

Subject Code: BTDS-603-20

M.Code:93960/93675/93383

Date of Examination: 12-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	What is the role of data science in Big Data analytics?	CO-1	L1
b.	Describe how Hadoop ensures fault tolerance using HDFS replication mechanism.	CO-1	L2
c.	Summarize the responsibilities of Resource Manager and Node Manager in Hadoop.	CO-1	L2
d.	Define the purpose of communicating analytical results in the Data Analytics Lifecycle?	CO-2	L1
e.	Describe how poor data understanding can affect the final outcomes of an analytics project.	CO-2	L2
f.	Explain the Deployment phase and its role in converting analytical models into real-world applications.	CO-2	L2
g.	Illustrate the concept of underfitting in the context of supervised learning.	CO-3	L2
h.	Explain the different metrics to evaluate the performance of the model.	CO-3	L2
i.	State correlation matrix and its usage in finding relation between attributes.	CO-4	L1
j.	Describe how poor visualization design can lead to misinterpretation of data insights.	CO-4	L2
SECTION-B			
2.	A text dataset is stored in HDFS. Examine the steps to implement a Word Count program using MapReduce, including Mapper and Reducer logic, and explain how the output is generated.	CO-1	L4
3.	Given a dataset with multiple attributes, Analyze how you would perform feature selection and feature transformation. Explain your choices and their impact on model performance.	CO-2	L4



4.	Determine how unsupervised learning techniques like clustering can be applied to a dataset without labels, and write the steps involved in grouping similar data points.	CO-3	L5
5.	Analyze different challenges that are faced while creating final deliverables in Big Data Analytics.	CO-4	L4
6.	You are provided with a healthcare dataset containing patient attributes and disease outcomes. Develop a supervised learning model to predict disease risk, evaluate its performance using appropriate metrics, and present the predicted risk scores using suitable visualizations for clinical interpretation.	CO-4	L5
SECTION-C			
7.	A file of size 1 TB is stored in HDFS with a block size of 128 MB and replication factor of 3. Compute the following: (a) Calculate the number of blocks created (b) Determine total storage required (c) Analyze how Map Reduce tasks will be scheduled across DataNodes (d) Discuss the role of server components in this process	CO-1	L5
8.	Examine a comprehensive framework for market basket analysis using association rule mining, including the generation and evaluation of rules through support, confidence, and lift, and critically examine how visualization strategies influence the interpretation, validity, and business applicability of the results.	CO-3	L4
9.	Design a data visualization framework to optimize customer retention in a subscription-based business. Critically analyze the choice of visualization techniques and illustrate how they contribute to actionable insights using appropriate diagrams.	CO-4	L6

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Roll No.

Total No. of Questions: 9

Date : 12-05-2023
Total No. of Pages: 2B.TECH(CSE), Semester-6TH
Subject Name: COMPILER DESIGN
Subject Code: BTCS-601-18
M. Code: 79249

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
a.	What is translator? Write down the steps to execute a program.	CO-1	L1	2
b.	Illustrate the role of buffering used in lexical analysis.	CO-1	L2	2
c.	Define the role of CFG in compiler design.	CO-2	L1	2
d.	Differentiate Top Down parsing and Bottom Up parsing.	CO-2	L2	2
e.	State the role of semantic rules in Syntax Directed Definitions (SDD).	CO-3	L1	2
f.	Interpret postfix notation for the given expression $a+b*c$.	CO-3	L2	2
g.	Define scope and life time of variable in context of a program.	CO-4	L1	2
h.	Compare machine dependent and machine independent phases of compiler.	CO-4	L2	2
i.	Interpret the Analysis and Synthesis Model of Compiler.	CO-5	L1	2
j.	Interpret dead code elimination with suitable example.	CO-5	L2	2
SECTION B				20
2.	Construct a Finite Automata from the given RE $[ab + (b + aa)b + a]$.	CO-1	L3	5
3.	Calculate FIRST and FOLLOW for the following grammar. $S \rightarrow xABC$ $A \rightarrow a bbD$ $B \rightarrow a \epsilon$ $C \rightarrow b \epsilon$ $D \rightarrow c \epsilon$	CO-2	L4	5
4.	Explain the backpatching technique in compiler design to generate intermediate code for control flow statements, illustrating the process with a suitable example.	CO-3	L5	5
5.	Identify the various data structures used in symbol table.	CO-4	L3	5

Q No.	Description	CO	BL	Marks
6.	Interpret the following terms in context of code optimization with suitable examples : a) code motion b) Strength reduction	CO-5	L5	5
SECTION C				20
7.	Construct Predictive Parse Table for the grammar $E \rightarrow E+T/T$ $T \rightarrow T*F/F$ $F \rightarrow (E) id$ and parse the string $id+id*id$.	CO-2	L3	10
8.	Build quadruples, triples and indirect triples for the expression: $-(a*b)+(c+d)-(a+b+c+d)$ and also mention their advantages and disadvantages.	CO-3	L3	10
9.	Construct DAG and syntax tree for the following 3 address code 1. $a = b+c$ 2. $t1 = a*a$ 3. $b = t1+a$ 4. $c = t1*b$ 5. $t2 = c+b$ 6. $a = t2+t2$	CO-5	L6	10

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Roll No.

Total No. of Questions: 7

Date : 12-05-2026
Total No. of Pages: 2BSc (AIML), Semester-6th
Subject Name: BIG DATA ANALYTICS
Subject Code: UGCA2006 E2
M. Code : 93655

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
1.a.	List the characteristics of distributed file systems.	CO-1	L1	2
1.b.	Differentiate between structured and unstructured data.	CO-1	L2	2
1.c.	What is the working of DataNode in HDFS?	CO-2	L1	2
1.d.	Difference between copyFromLocal and copyToLocal commands.	CO-2	L2	2
1.e.	Explain Hadoop architecture in terms of distributed processing.	CO-2	L2	2
1.f.	Explain how metadata is stored in HDFS.	CO-2	L2	2
1.g.	List Pig architecture components.	CO-3	L1	2
1.h.	Interpret the output of the Explain operator.	CO-3	L2	2
1.i.	Write the importance of date-time functions usage.	CO-4	L1	2
1.j.	Explain the SELECT operation in Hive with an example query.	CO-4	L2	2
SECTION B				40
2.	Breakdown the YARN framework in terms of its components and scheduling mechanism for distributed applications.	CO-1	L4	10
3.	Explain the HDFS file read mechanism in ensuring efficient data retrieval across distributed nodes.	CO-2	L5	10
4.	Write basic Pig operations in terms of Dump, Describe, Explain, Illustrate, and Store for data analysis.	CO-3	L3	10
5.	Discover the heartbeat mechanism for monitoring DataNode status in HDFS.	CO-2	L4	10
6.	Select appropriate Pig operators in terms of solving specific data processing problems such as filtering, grouping, and joining datasets.	CO-3	L5	10
7.	Validate complete Pig data processing workflow in terms of accuracy, efficiency, and scalability in real-world scenarios	CO-4	L5	10

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Roll No. Date : 12-05-2020
Total No. of Pages: 2

Total No. of Questions: 7

BSc (Cyber Security), Semester-6th
Subject Name: CLOUD SECURITY ARCHITECTURE
Subject Code: UGCA2045 E2
M. Code: 94322

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
1.a.	Name any two cloud service models used in cloud computing.	CO-1	L1	2
1.b.	Explain the concept of virtualization and how it differs from traditional physical computing environments.	CO-1	L2	2
1.c.	Differentiate between Type-1 and Type-2 hypervisors.	CO-2	L2	2
1.d.	What is a hypervisor in cloud computing.	CO-2	L1	2
1.e.	Explain the importance of HA and DR in virtualized environments.	CO-2	L2	2
1.f.	Describe the concept of Software Defined Networking (SDN)	CO-2	L2	2
1.g.	Find the role of cloud storage authentication in cloud computing.	CO-3	L1	2
1.h.	Explain how encryption helps in securing object storage in cloud environments.	CO-3	L2	2
1.i.	Recall the primary objective of data privacy regulations.	CO-4	L1	2
1.j.	Explain the importance of compliance with data protection regulations.	CO-4	L2	2
SECTION B				40
2.	Use SaaS, PaaS, and IaaS models to demonstrate their application in a small business scenario.	CO-1	L3	10
3.	Explain the benefits and limitations of Software Defined Networking (OpenFlow/Open vSwitch) compared to traditional networking in virtualized infrastructures.	CO-2	L5	10
4.	Identify how organizations can implement data privacy protection while using public cloud storage services.	CO-3	L3	10
5.	Analyze how server virtualization enhances resource utilization by examining its impact on CPU, memory, and storage allocation, and differentiate it from traditional physical server usage in enterprise environments.	CO-2	L4	10
6.	Distinguish the shared responsibility model and figure out its impact on cloud storage security.	CO-3	L4	10
7.	Explain how identity and access management (IAM) policies contribute to governance in multi-cloud environments and analyze associated risks.	CO-4	L5	10

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Roll No.

Total No. of Questions: 7

Date : 05-05-2026
Total No. of Pages: 1BSc (Cyber Security), Semester-6th
Subject Name: MACHINE LEARNING
Subject Code: UGCA1950 E2
M Code: 94316

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
1.a.	Name any two major categories of Machine Learning with one example each.	CO-1	L1	2
1.b.	Outline the concept of overfitting in Machine Learning models.	CO-1	L2	2
1.c.	Describe the Grid Search technique for hyperparameter tuning.	CO-2	L2	2
1.d.	Interpret the equation " $Y=MX+C$ " with example.	CO-2	L2	2
1.e.	Explain why training data size can influence the performance of different machine learning models.	CO-3	L2	2
1.f.	Summarize the role of Discount Factor in Q-Learning for considering future rewards.	CO-4	L2	2
1.g.	Name the different distance measures used in clustering.	CO-4	L1	2
1.h.	Describe the different reinforcement learning models and justify their suitability for solving real-world decision-making problems.	CO-6	L2	2
1.i.	Explain the concept of a Markov Decision Process (MDP) and its components.	CO-5	L2	2
1.j.	Compare Decision Tree and Naïve Bayes in terms of prediction approach and model behavior.	CO-3	L2	2
SECTION B				40
2.	Solve a regression problem by deriving and minimizing the cost function with a suitable example	CO-1	L3	10
3.	Classify regression and classification problems with suitable examples and justification.	CO-2	L4	10
4.	Evaluate the possible failure points in the Machine Learning process pipeline and discuss their causes.	CO-3	L5	10
5.	Interpret the impact of epsilon value on learning and action selection strategy.	CO-4	L5	10
6.	Judge the Q-values and V-values in decision making for reinforcement learning systems.	CO-5	L5	10
7.	Evaluate and compare Random Forest, SVM, and Naïve Bayes for a classification problem and justify the best model.	CO-6	L4	10

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Roll No.

Total No. of Questions: 7

Date : 05-05-2026
Total No. of Pages: 1

BSc (AIML), Semester-6th
Subject Name: BUSINESS INTELLIGENCE
Subject Code: UGCA2016
M. Code: 93651

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
1.a.	Define ETL in Business Intelligence.	CO-1	L1	2
1.b.	List any two examples of structured decisions.	CO-1	L2	2
1.c.	List the steps in developing a mathematical model.	CO-2	L1	2
1.d.	What is meant by a classification problem?	CO-2	L1	2
1.e.	Explain any two data mining analysis methodologies	CO-3	L2	2
1.f.	Define Relational Marketing with example.	CO-3	L1	2
1.g.	What is customer relationship management (CRM) in relational marketing?	CO-4	L1	2
1.h.	Compare expert systems and human experts.	CO-4	L2	2
1.i.	Summarize the connection between organizational learning and knowledge management.	CO-5	L2	2
1.j.	Describe the backlogging process in logistic systems.	CO-4	L2	2
SECTION B				40
2.	Identify various factors affecting decision making process & explain decision and problem solving with diagram	CO-1	L3	10
3.	Analyze the problems caused by inconsistent data and explain how consistency checking improves data quality.	CO-2	L4	10
4.	Evaluate the impact of data transformation techniques on data accuracy and performance.	CO-3	L5	10
5.	Organize the role of expert system in evaluation metrics in assessing the predictive performance of a model.	CO-4	L3	10
6.	Write note on cross-efficiency analysis, evaluation of virtual inputs and virtual outputs, and weight restrictions.	CO-5	L3	10
7.	Evaluate Efficiency Measures and Efficient Frontier in Data Envelopment Analysis.	CO-4	L5	10

NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the student.



5/05 (M)

Roll No.

Total No. of Questions: 9

B.TECH (CSE/ECE/IT/AIML/AIDS/CSE IOT/CSE DS), Semester-6TH

Subject Name: WIRELESS COMMUNICATION

Subject Code: BTEC-601-18

Mcode: 79373

Time: 03:00 Hrs.

Date : 05-05-2026

Total No. of Pages: 1

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
a.	Explain why C/I ratio is important for cellular system performance.	CO-1	L1	2
b.	Explain how cell splitting improves system capacity.	CO-1	L2	2
c.	List the types of diversity techniques used in communication systems.	CO-2	L1	2
d.	Why does fading occur in mobile communication systems?	CO-2	L2	2
e.	What is a guard band in FDMA?	CO-3	L1	2
f.	Why is synchronization important in TDMA systems?	CO-3	L2	2
g.	What are the different types of services provided by GSM?	CO-4	L1	2
h.	Explain the use of PN sequences used in CDMA.	CO-4	L2	2
i.	What are the different services of 5G technology?	CO-5	L1	2
j.	Illustrate the concept of Internet of Things in communication networks.	CO-5	L2	2
SECTION B				20
2.	Analyze the handover mechanism in a cellular wireless communication system. Classify the different types of handover.	CO-1	L4	5
3.	Apply the classification of small scale fading to determine whether a given channel scenario results in flat fading or frequency selective fading.	CO-2	L3	5
4.	Compare the advantages and limitations of SDMA with other multiple access techniques used in cellular systems.	CO-3	L4	5
5.	List the various components of the GSM frame hierarchy and briefly explain the role of each component.	CO-4	L5	5
6.	Evaluate whether 5G provides significant improvement over 4G in terms of latency and speed.	CO-5	L5	5
SECTION C				20
7.	Compare Maximal Ratio Combining, Equal Gain Combining, and Selection Combining with respect to performance and implementation complexity.	CO-2	L4	10
8.	Explain how packet radio protocols improve data transmission efficiency.	CO-3	L5	10
9.	Determine the role of Bluetooth technology in personal area networks (PANs) and explain the concept of piconet and scatternet in Bluetooth networks.	CO-5	L5	10

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Roll No.

Total No. of Pages: 1

Total No. of Questions: 07

B.Sc-Data Analytics, Semester-6th**MACHINE LEARNING**

Subject Code: UGCA1950

M.Code: 94342

Date of Examination: 07-05-2026

Time: 3 Hrs.

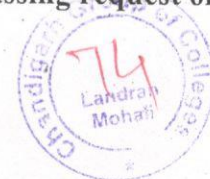
Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION-B consists of **SIX** questions, each carrying **TEN** marks each and the student has to attempt any **FOUR** questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define scope of Machine Learning in Robotics.	CO1	L1
b.	What is Supervised Learning?	CO1	L1
c.	Explain Gradient Descent in simple words.	CO4	L2
d.	What is Grid Search in Machine Learning?	CO4	L1
e.	Illustrate the decision tree algorithm with an example.	CO2	L2
f.	Demonstrate confusion matrix in machine learning.	CO2	L2
g.	Compare Clustering and Classification with suitable examples.	CO3	L2
h.	How to select the best hyperparameter?	CO3	L1
i.	Explain Reinforcement Learning with suitable examples.	CO5	L2
j.	Which method is commonly used to balance the Exploration and Exploitation dilemma ?	CO5	L1
SECTION-B			
2.	Apply linear regression to predict house prices using at least two real-world examples.	CO1	L3
3.	Analyze the difference between Random Forest and Decision Tree based on accuracy and overfitting.	CO2	L4
4.	Evaluate the effectiveness of Naïve Bayes for text classification and justify your answer.	CO4	L5
5.	Make use of Support Vector Machine concepts to classify spam and non-spam emails. Describe the separation process.	CO4	L3
6.	Compare Hierarchical and C-means Clustering for customer segmentation with diagrams and examples.	CO3	L4
7.	Justify the impact of Gama value in Q-learning on agent performance with appropriate examples.	CO5	L5

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Roll No. Date : 08-05-2024
Total No. of Pages : 1

Total No. of Questions: 9

B.TECH(CSE IOT), Semester-6TH
Subject Name: IOT SECURITY
Subject Code: BTITCS608-20
M-Code: 93423

Max. Marks: 60

Time: 03:00 Hrs.

INSTRUCTIONS TO CANDIDATES:

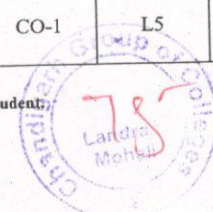
SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
a.	Define the term "sensor" in IoT systems.	CO-1	L1	2
b.	Explain the function of any two layers in IoT architecture	CO-1	L2	2
c.	Explain various physical security threats affecting IoT devices.	CO-1	L2	2
d.	List common attack techniques used against IoT systems.	CO-2	L1	2
e.	Illustrate the process of firmware analysis for IoT security with suitable examples.	CO-2	L2	2
f.	Describe the interconnect analysis helps in understanding IoT system communication with reasons.	CO-2	L2	2
g.	State any two IoT network security protocols.	CO-3	L1	2
h.	Describe the role of authentication techniques in protecting IoT devices.	CO-3	L2	2
i.	List any two tools used for monitoring IoT networks.	CO-4	L1	2
j.	Describe the working mechanism of intrusion detection systems in IoT systems, with emphasis on threat detection.	CO-4	L2	2
SECTION B				20
2.	Utilize layered IoT architecture components to design a smart parking solution for efficient space allocation and monitoring.	CO-1	L3	5
3.	Examine different categories of threats present in IoT environments by analyzing their sources, characteristics, and impact on system security.	CO-2	L4	5
4.	Determine the reliability of secure communication channels in IoT networks by evaluating their capability to ensure data confidentiality, integrity, and protection against interception or tampering, with suitable justification.	CO-3	L5	5
5.	Determine the security posture of a complex IoT network using computational tools by analyzing their effectiveness in threat detection, risk assessment, and incident response.	CO-4	L5	5
6.	Categorize different access control models used in IoT systems by analyzing their structural design, operational mechanisms, and effectiveness in enforcing secure access and protecting sensitive data.	CO-3	L4	5
SECTION C				20
7.	Apply threat detection techniques in a connected vehicular IoT system to examine data flow, identify potential attack vectors, and implement appropriate security measures to maintain safe and efficient communication	CO-2	L3	10
8.	Differentiate hardware-based and software-based security techniques in wearable fitness devices by analyzing their design, implementation, and effectiveness in protecting sensitive user data and ensuring device security.	CO-3	L4	10
9.	Determine the effectiveness of tamper-resistant techniques in IoT-based smart energy meters by validating their role in ensuring device integrity and preventing manipulation.	CO-1	L5	10

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Roll No.

Total No. of Questions: 9

Date : 08-05-2026
Total No. of Pages: 2B.TECH(AIDS), Semester-6TH
Subject Name: DEEP LEARNING
Subject Code: BTCS 704-18
M Code: 93966

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
a.	Define the meaning of underfitting in deep learning.	CO-1	L1	2
b.	Explain how bias and variance affect the performance of a machine learning model.	CO-1	L2	2
c.	List types of gradient-based learning.	CO-2	L1	2
d.	Illustrate bagging ensembling technique.	CO-2	L2	2
e.	List two applications where ResNet is used in deep learning.	CO-3	L1	2
f.	Find the output feature map size for a convolution layer with input size 32×32 , filter size 5×5 , stride 1, and padding 0.	CO-3	L2	2
g.	Define attention mechanism in Encoder-Decoder sequence-to-sequence models.	CO-4	L1	2
h.	Define long-term dependency problem in Recurrent Neural Networks with example.	CO-4	L2	2
i.	Define generative model with example in machine learning.	CO-5	L1	2
j.	Describe the concept of sampling in generative models.	CO-5	L2	2
SECTION B				20
2.	Apply the concept of supervised learning to model a real-world problem and illustrate it with suitable applications.	CO-1	L3	5
3.	Distinguish between L1 and L2 regularization by analyzing their effects on model weights.	CO-2	L4	5
4.	Justify the selection of AlexNet or VGGNet for real-world applications by evaluating their architectural features, performance, and practical trade-offs.	CO-3	L5	5
5.	Explain the architecture and working of an Echo State Network (ESN).	CO-4	L5	5
6.	A hospital wants to predict disease risk using a Deep Belief Network. Create a DBN architecture for: Input features = 200 and Hidden layers = ? (design choice). a) Propose the layer structure b) Estimate total parameters	CO-5	L6	5
SECTION C				20
7.	A model shows high accuracy on training data but low performance on test data. Analyze the causes based on the learning process and recommend appropriate solutions.	CO-2	L4	10
8.	In a Self-Driving Car Vision System, CNN processes road images of size $128 \times 128 \times 3$. Apply CNN operations to: a) Design one convolution + pooling layer b) Compute output feature map size c) Explain how CNN helps detect objects like pedestrians	CO-3	L3	10
9.	A dataset of size 2048 features is compressed to 128 features using an autoencoder. Evaluate the following a) Compression ratio b) Reconstruction loss impact c) Trade-off between compression and accuracy d) Suitability for real-world data transmission	CO-5	L5	10

NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the student.

Roll No.

Total No. of Questions: 8

Date : 08-05-2025
Total No. of Pages: 2B.TECH(AIML), Semester-6TH
Subject Name: COMPUTER NETWORKS
Subject Code: BTCS-504-18-102
M. Code: 93665

Time: 03:00 Hrs.

INSTRUCTIONS TO CANDIDATES:

Max. Marks: 60

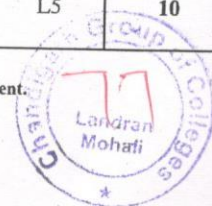
SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
a.	What is the difference between star topology and bus topology?	CO-1	L1	2
b.	Write any two functions of the Data Link Layer in the OSI model	CO-1	L2	2
c.	For a received Hamming Code 0110011, check whether an error has occurred. If yes, locate and correct the error using parity check.	CO-2	L1	2
d.	Illustrate the CSMA/CD protocol help in handling collisions?	CO-2	L2	2
e.	Define switching in computer networks.	CO-3	L1	2
f.	Outline the working principle of the Stop-and-Wait ARQ protocol.	CO-3	L2	2
g.	Name two unicast routing protocols.	CO-4	L1	2
h.	Explain the need for Congestion Control in networks.	CO-5	L2	2
i.	Give any two advantages of DHCP.	CO-5	L2	2
j.	Differentiate between hardware firewall and software firewall in terms of their deployment.	CO-6	L2	2
SECTION B				20
2.	Apply the principle of Wave Division Multiplexing (WDM) to a real communication scenario and demonstrate why it is particularly useful in optical fiber communication.	CO-1	L3	5
3.	Differentiate between IPv4 and IPv6 addressing schemes, highlighting structural and functional differences with examples.	CO-2	L4	5
4.	Critically analyze how subnetting improves network performance and security in this scenario	CO-3	L5	5
5.	A network uses the Leaky Bucket algorithm with a bucket size of 10 packets and output rate of 2 packets/sec. Design and analyze how the system handles a burst of 15 packets arriving at once.	CO-4	L5	5
6.	Apply the basic concepts of cryptography to demonstrate plaintext, ciphertext, encryption, and decryption with suitable examples.	CO-6	L3	5
SECTION C				20
7.	Simplify With suitable examples and analyze circuit switching, packet switching, and message switching, and explain how they differ in handling bandwidth, delay, and reliability.	CO-2	L4	10
8.	Illustrate the application of Quality of Service (QoS) in a hospital communication system where voice, video, and data traffic must be prioritized differently to ensure timely response.	CO-4	L3	10
9.	Justify the need for public key infrastructure (PKI) in digital communication systems, highlighting its advantages and limitations.	CO-5	L5	10

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Roll No.

Total No. of Questions: 9

Date : 08-05-2026
Total No. of Pages: 1B.TECH(CSE), Semester-6TH
Subject Name: MOBILE APPLICATION DEVELOPMENT
Subject Code: BTCS-620-18

M. Code : 79258

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
a.	Define device compatibility in mobile applications.	CO-1	L1	2
b.	Illustrate the role of permissions in protecting user data in Android.	CO-1	L2	2
c.	What are CRUD methods of Content Resolver Class?	CO-2	L1	2
d.	Outline the role of Enterprise Mobility Management (EMM)?	CO-2	L2	2
e.	What is Text-to-Speech (TTS) in Android?	CO-3	L1	2
f.	Explain the two different types of threads in Android applications.	CO-3	L2	2
g.	What is a Mobile Agent in mobile computing?	CO-4	L1	2
h.	Explain the advantages of Peer-to-Peer networking.	CO-4	L2	2
i.	What is UI testing in an Android application?	CO-5	L1	2
j.	Illustrate the concept of test doubles.	CO-5	L2	2
SECTION B				20
2.	Identify the role of the Open Handset Alliance (OHA) in the development of the Android operating system.	CO-1	L3	5
3.	Distinguish between application context and activity context.	CO-2	L4	5
4.	Explain how a Content Provider behaves like a database in Android. Justify your answer with relevant operations.	CO-3	L5	5
5.	Interpret some common methods of Canvas Class in Android graphics. Give its usage in real life.	CO-4	L5	5
6.	Explain how the Android Application Sandbox contributes to application security.	CO-5	L5	5
SECTION C				20
7.	Analyze the process of writing and viewing log messages in Android by examining the Log class methods, log priority levels, and the functions of the Logcat toolbar.	CO-2	L4	10
8.	Evaluate the challenges in Mobile Software Engineering, including device heterogeneity, platform fragmentation, and usage context.	CO-4	L4	10
9.	Assess the importance of HTTPS/SSL protocols, SafetyNet Attestation API, Cryptography in ensuring security in Android applications and justify their use in modern mobile apps.	CO-5	L5	10

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Roll No.

Total No. of Questions: 9

Date : 08-05-2026
Total No. of Pages: 1B.TECH(ECE), Semester-6TH
Subject Name: COMPUTER NETWORKS
Subject Code: BTCS-504-18

Mcode: 79374

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
a.	Write techniques of bandwidth utilization in data communication	CO-1	L1	2
b.	Illustrate any two functions of Data Link Layer in computer networking.	CO-1	L2	2
c.	Compare half duplex and full duplex communication.	CO-1	L2	2
d.	Define High-Level Data Link Control (HDLC) protocols used in data link layer.	CO-2	L1	2
e.	Describe how a Checksum is used to detect errors in a transmitted packet	CO-2	L2	2
f.	Outline logical addressing during data transfer.	CO-3	L2	2
g.	Outline the use of process to process communication.	CO-3	L1	2
h.	How Quality of Service (QoS) is beneficial in transport layer?	CO-4	L2	2
i.	Explain why firewall is needed in computer network.	CO-4	L2	2
j.	Define File Transfer Protocol in application layer.	CO-4	L1	2
SECTION B				20
2.	Build various types of networks topologies in computer network. Also discuss various advantages and disadvantages of each topology.	CO-1	L3	5
3.	Analyze Go-Back-N ARQ protocol with suitable example in DLL.	CO-2	L4	5
4.	Critically evaluate why TCP uses a "Window" instead of sending one segment and waiting for one ACK at a time.	CO-3	L5	5
5.	Is it "fair" to trust an ARP response without checking ID? Critically evaluate the risk.	CO-3	L5	5
6.	Evaluate the role of DNS in ensuring reliable and scalable internet communication. What problems would occur if DNS did not exist?	CO-4	L5	5
SECTION C				20
7.	A sender needs to send a long stream of bits. Apply the concept of framing and explain how frames help in synchronization and error control.	CO-2	L3	10
8.	Differentiate between "Congestion Control" and "Flow Control." Analyze a scenario where the network is fast but the receiver is slow, and explain which specific mechanism would be triggered to manage the data rate.	CO-3	L4	10
9.	Explain the World Wide Web (WWW) and HTTP. Describe how HTTP helps in accessing web pages on the WWW with a simple example.	CO-4	L5	10

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Roll No.

Total No. of Questions: 9

B.TECH(CSE/CSE DS), Semester-6TH

Subject Name: MACHINE LEARNING

Subject Code: BTCS-618-18

M. Code: 79257/93387

Date: 05-05-2020

Total No. of Pages: 2

Time: 03:00 Hrs.

INSTRUCTIONS TO CANDIDATES:

Max. Marks: 40

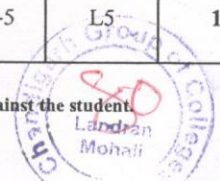
SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
a.	Define the concept of data wrangling.	CO-1	L1	2
b.	Compare supervised learning and unsupervised learning with respect to data and output.	CO-1	L2	2
c.	Name the technique used to scale values between 0 and 1.	CO-2	L1	2
d.	Summarize the importance of splitting a dataset into training and testing sets.	CO-2	L2	2
e.	What is Simple Linear Regression?	CO-3	L1	2
f.	Illustrate the representation of Regression data using scatter plots.	CO-3	L2	2
g.	List any two real-life applications of classification.	CO-4	L1	2
h.	Illustrate the use of Fuzzy Clustering in Machine Learning.	CO-4	L2	2
i.	What is the role of mutation in Genetic Algorithms.	CO-5	L1	2
j.	Explain the role of fitness function in a genetic algorithm.	CO-5	L2	2
SECTION B				20
2.	Make use of any machine learning model in designing of driverless car with the help of suitable steps.	CO-1	L3	5
3.	Assume a dataset contains missing and noisy values. Explain suitable data cleaning techniques to handle these issues.	CO-2	L4	5
4.	Evaluate the performance of a regression model using MAE and discuss its advantages over RMSE.	CO-3	L5	5
5.	Compare K-Nearest Neighbours (K-NN) and Support Vector Machine (SVM) in terms of methodology and performance.	CO-4	L5	5
6.	Construct the working of the Apriori algorithm for frequent itemset generation and explain its step-by-step process.	CO-5	L6	5
SECTION C				20
7.	Examine how data transformation functions such as aggregation, normalization, and generalization improve data usability.	CO-2	L4	10
8.	Interpret the results of a regression model using R^2 , correlation coefficient, and error metrics, and explain what these values indicate about model accuracy.	CO-3	L5	10
9.	Compare different types of activation functions (Sigmoid, ReLU, Tanh) in terms of performance, advantages, and limitations.	CO-5	L5	10

NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the student.



Roll No. Date : 08-05-2026
Total No. of Pages: 2

Total No. of Questions: 7

BSc (AIML), Semester-6th
Subject Name: INTELLIGENT SYSTEMS
Subject Code: UGCA2010 E2
M. Code: 93652

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
1.a.	List any two components of an artificial neural network.	CO-1	L1	2
1.b.	Outline how genetic algorithms are used in intelligent systems.	CO-1	L2	2
1.c.	What is completeness in search algorithms?	CO-2	L1	2
1.d.	Classify mutation in genetic algorithms, and why is it important?	CO-2	L2	2
1.e.	What are frames in knowledge representation?	CO-3	L1	2
1.f.	Describe the working of simulated annealing.	CO-3	L2	2
1.g.	Define the concept of knowledge representation in AI.	CO-4	L1	2
1.h.	Summarize the importance of uncertainty handling in AI systems.	CO-4	L2	2
1.i.	What is statistical learning in Intelligent System?	CO-5	L1	2
1.j.	Explain four advantages of evolutionary algorithms.	CO-5	L2	2
SECTION B				40
2.	Inspect how an RBF network model can be used to approximate a function and interpret the results.	CO-1	L4	10
3.	Examine the limitations of Greedy Best-First Search and explain how they affect performance.	CO-2	L4	10
4.	Interpret the working of backpropagation with mathematical steps and write its effectiveness in training neural networks.	CO-3	L5	10
5.	Explain machine learning algorithms perform in uncertain environments and state different challenges involved in it.	CO-5	L5	10
6.	Compare deterministic and probabilistic search techniques with respect to their performance and applicability.	CO-4	L5	10
7.	Justify different uncertainty reasoning techniques used in AI and discuss their suitability for various problem domains.	CO-5	L5	10

NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the student.



Roll No.

Total No. of Questions: 7

Date : 08-05-2026
Total No. of Pages: 2BSc (Cyber Security), Semester-6th
Subject Name: SOCIAL MEDIA SECURITY
Subject Code: UGCA2043 E2
M. Code: 94320

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B consists of SIX questions, carrying TEN marks each and student have to attempt any FOUR questions.

Q No.	Description	CO	BL	Marks
SECTION A				20
1.a.	What is the meaning of Social Networking?	CO-1	L1	2
1.b.	Describe the role of connectivity in social networks.	CO-1	L2	2
1.c.	Explain the emergence of the Social Web.	CO-1	L2	2
1.d.	Define Big Data in the context of social networking.	CO-2	L1	2
1.e.	Classify the tools used for detecting communities.	CO-2	L2	2
1.f.	Explain how privacy concerns arise during data extraction.	CO-2	L2	2
1.g.	What is multi-factor authentication?	CO-3	L1	2
1.h.	Summarize the function of firewalls in network access control.	CO-3	L2	2
1.i.	What do you mean by data sharing?	CO-4	L1	2
1.j.	Describe the concept of location awareness in digital platforms.	CO-4	L2	2
SECTION B				40
2.	Identify and explain different graph theory concepts such as nodes, edges, paths, and connectivity used in social network modeling.	CO-1	L3	10
3.	Compare different community detection algorithms in detail based on accuracy, scalability, and complexity.	CO-2	L4	10
4.	Examine the effectiveness of Identity and Access Management (IAM) systems in enterprise environments.	CO-3	L4	10
5.	Compare static and dynamic community detection techniques and analyze their advantages and limitations in evolving networks.	CO-2	L4	10
6.	Analyze how authentication mechanisms used in social networks. Which methods provide the best trade-off between usability and security?	CO-3	L4	10
7.	Interpret the relationship between user awareness and cyber policy effectiveness in protecting personal information.	CO-4	L5	10

NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the student.

1615 (M)

Total No. of Pages:02

Total No. of Questions: 09

B.Tech (CSE), Semester 7th

ADHOC AND WIRELESS SENSOR NETWORKS

Subject Code: BTCS-716-18

M.Code: 90507

Date of Examination: 16-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Landran Mohali

8.	Classify routing protocols into proactive, reactive, and hybrid categories, and explain their characteristics with suitable examples.	CO-3	L4
9.	Explain the hardware components of a single-node architecture and conclude how each component impacts the node performance.	CO-4	L5

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Roll No. Total No. of Pages: 02
Total No. of Questions: 09

B. Tech (AIDS), Semester 7th
Computer Vision
Subject Code: BTAIML 701-20
M. Code: 94006
Date of Examination: 16-05-2026

Time: 3 Hrs. Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly: What is the difference between sampling and quantization?	CO-1	L1
a.			
b.	Compare image enhancement and image restoration.	CO-1	L2
c.	Outline one application of morphological processing.	CO-1	L2
d.	Write short note on pseudo color image processing.	CO-2	L1
e.	Illustrate the elements of visual perception relevant to computer vision.	CO-2	L2
f.	Explain the evolution of digital image processing.	CO-2	L2
g.	What is template matching?	CO-3	L1
h.	Interpret the role of machine learning in object recognition.	CO-3	L2
i.	List applications of volumetric shape reconstruction.	CO-4	L1
j.	Extend the term projection matrix.	CO-4	L2

SECTION-B

2.	Examine the influence of human visual perception on the design of image enhancement techniques.	CO-1	L4
3.	Differentiate between image negation and logarithmic transformation techniques used in digital image processing.	CO-2	L4
4.	Explain the effectiveness of high-pass and low-pass filters in image smoothing and sharpening with proper justification.	CO-3	L5
5.	Examine the effectiveness of template matching versus machine learning methods.	CO-4	L4
6.	Explain stereo vision and its applications in computer vision systems.	CO-3	L5

SECTION-C

7.	Classify the process of image sensing and acquisition by explaining its key stages, types of sensors, and methods used to capture and digitize images, along with suitable examples.	CO-2	L4
8.	Examine how machine learning improves object recognition systems by analyzing its role in feature extraction, pattern learning, accuracy enhancement, and adaptability to complex data.	CO-3	L4
9.	a) Explain the difference between spatial resolution and intensity resolution b) Justify the use of spatial filtering in image restoration by analysing its effectiveness in noise reduction.	CO1	L5

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1||M-94006

2||M-94006



Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (AIDS), Semester 7th
BUSINESS INTELLIGENCE

Subject Code: -BTDS-705-20

M.Code: - 94023

Date of Examination: / 3-05-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define Business Intelligence and list its two applications.	CO-1	L1
b.	Explain why timely decisions are important in BI.	CO-1	L2
c.	List the inputs and outputs of a typical data mining process.	CO-2	L1
d.	Summarize knowledge discovery in databases (KDD) with example.	CO-2	L2
e.	List the types of business intelligence users.	CO-3	L1
f.	Illustrate dimensional analysis with example.	CO-3	L2
g.	Explain BI scorecards with example.	CO-4	L2
h.	Explain role of good operating practices.	CO-5	L2
i.	Define Efficiency Model. List one example.	CO-6	L2
j.	Recall outlier analysis with business data example.	CO-6	L1
SECTION-B			
2.	Build the Business Intelligence architecture in detail. Identify the use of each component.	CO-1	L3
3.	Analyze the ethical issues involved in using data mining within Business Intelligence applications.	CO-2	L4
4.	Explain various types of visualization methods. Compare the standard and interactive reports with example.	CO-3	L5
5.	Elaborate the applications of BI knowledge delivery process in the healthcare sector with examples.	CO-4	L6
6.	Identify the simple cycle of Business Intelligence (BI) analysis for a retail company aimed at improving customer retention, describing each step and its purpose.	CO-6	L3
SECTION-C			
7.	Develop the steps for a Business Intelligence system in an organization starting from data collection up to knowledge delivery.	CO-1	L3



8.	Identify the optimization techniques that can be applied to Business Intelligence (BI) visualization, considering their impact on clarity, performance, and decision-making effectiveness.	CO-4	L3
9.	Evaluate the strengths and limitations of using pattern matching techniques in efficiency measurement. Determine how these methods contribute to identifying performance trends, diagnosing inefficiencies, and supporting managerial decision-making.	CO-5	L5

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Roll No.

Total No. of Pages:02

Total No. of Questions: 09

B.Tech (AIML), Semester-7th

DEEP LEARNING

Subject Code: BTCS 704-18

M.Code: 93998

Date of Examination: 13-05-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION-B contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. SECTION C contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What is the purpose of model evaluation?	CO-1	L1
b.	Summarize the role of Bayesian approach in ML.	CO-1	L2
c.	Define multi-task learning.	CO-2	L1
d.	Summarize the working of regularization.	CO-2	L2
e.	Why padding is used in Convolutional Neural Network (CNN)?	CO-3	L1
f.	Compare convolution and fully connected layers.	CO-3	L2
g.	List two advantages of sequence modeling.	CO-4	L1
h.	Compare Recurrent Neural Network (RNN) and Convolutional Neural Network (CNN) for sequence data.	CO-4	L2
i.	Recall directed generative net.	CO-5	L1
j.	Explain different kind of nodes Boltzmann machines.	CO-5	L2
SECTION-B			
2.	Examine the impact of dataset size on the performance of supervised learning with suitable example.	CO-1	L4
3.	Apply gradient descent updates manually for a given loss function.	CO-2	L3
4.	Explain about neuroscientific basis for convolutional network.	CO-3	L5
5.	Inspect vanishing and exploding gradient problems in deep RNNs.	CO-4	L4



6.	Explain the structure of Restricted Boltzman Machine and its applications.	CO-5	L5
SECTION-C			
7.	Inspect the following: a) Data augmentation and adversarial training for improving generalization. b) Gradient-Based Learning and its role in deep learning.	CO-2	L4
8.	Make use of convolution function and pooling layer of Convolutional Neural Network for the image processing tasks. Identify the different steps of convolution algorithm for the same.	CO-3	L3
9.	Assess the architecture of encoder-decoder model and its role for automatic text summarization with suitable example.	CO-4	L5

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Total No. of Questions: 09

AGILE SOFTWARE DEVELOPMENT

M.Code: 90501

Time: 3 Hrs.**Max. Marks: 60**

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION-B contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. SECTION C contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define the term Incremental development in Agile.	CO-1	L1
b.	Outline the most critical Agile Matrices.	CO-1	L2
c.	What are the common types of impediment in Agile?	CO-2	L1
d.	Compare and contrast SDLC and Agile Technology.	CO-2	L2
e.	List the components in the user story.	CO-3	L1
f.	Summarize the team involved in Scrum.	CO-3	L2
g.	Illustrate the sprint burndown chart.	CO-4	L2
h.	Outline the different roles involved in implementing XP.	CO-5	L2
i.	Classify the process of limiting work in progress and also write its advantages.	CO-6	L2
j.	How should members of the development team facilitate one another?	CO-6	L1
SECTION-B			
2.	Construct Waterfall model as the basic model for software development.	CO-1	L3
3.	Examine some Agile metrics that need to be focused on.	CO-2	L4
4.	Justify the statement "Violating the Dependency Inversion Principle could lead to problems in a large-scale application".	CO-3	L5
5.	Determine the relationship between Build Breaker and Agile Methodology.	CO-4	L5
6.	Identify Agile methodologies that can be applied outside software testing.	CO-6	L3



SECTION-C			
7.	Apply Agile principles to a real-world scenario: How would you apply Agile methodology to manage a software project where customer requirements keep changing?	CO-1	L3
8.	Analyze the effectiveness of daily stand-up meetings in Scrum and their contribution to team collaboration and project progress.	CO-4	L4
9.	Critically evaluate how Kanban ensures continuous delivery and optimization. Support your answer with an example.	CO-5	L5

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Total No. of Pages:02

Total No. of Questions: 09

B.Tech (CSE/IT/AIML/AIDS), Semester 7th

ROUTING AND SWITCHING

Subject Code: BTEC-905A-18

M.Code:90691

Date of Examination: 09-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION-B contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. SECTION C contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	How many computers are typically supported in a peer-to-peer network? Explain with example.	CO-1	L1
b.	Differentiate between client and server roles.	CO-1	L2
c.	Differentiate between wired NIC and wireless NIC.	CO-1	L2
d.	List any two advantages of OSPF over RIP.	CO-2	L1
e.	Explain when static routing is preferred in a network.	CO-2	L2
f.	Explain why packet switching is more efficient than circuit switching.	CO-2	L2
g.	Define Frame Relay.	CO-3	L1
h.	Distinguish between static NAT and dynamic NAT.	CO-3	L2
i.	State the role of authorization in controlling user privileges	CO-4	L1
j.	Illustrate with an example how split tunneling can lead to data leakage or attacks?	CO-4	L2
SECTION-B			
2.	Analyze with the help of an example, how file system navigation and management is crucial in maintaining router or switch configurations.	CO-1	L3/L4
3.	Make use of Telnet and FTP protocols to perform remote administration and file transfers in a test environment.	CO-2	L3



4.	Determine the role of PPPoE in establishing DSL/ADSL connections with ISPs, and justify its effectiveness compared to other broadband access methods.	CO-3	L5
5.	Apply ACLs to design a rule set that permits only web traffic (HTTP/HTTPS) from a specific subnet while denying all others.	CO-4	L3
6.	Judge the effectiveness of VLAN principles in enhancing enterprise network security and efficiency, and defend their importance against alternative network structuring methods	CO-4	L5
SECTION-C			
7.	Examine the working of the DHCP protocol in assigning IP addresses to hosts.	CO-2	L4
8.	Identify the main challenges of deploying RAN in enterprises, such as signal interference and scalability.	CO-3	L3
9.	Evaluate the effectiveness of IPsec and VPN solutions in securing enterprise networks. Critically assess their strengths and limitations, and compare them with other encryption and tunneling technologies in terms of security, scalability, and performance.	CO-4	L5

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Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (AIDS), Semester-7th

COMPUTER NETWORKS

Subject Code: BTCS-504-18

M.Code: 93919

Date of Examination: 06-05-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Recall examples of widely used networking protocols.	CO-1	L1
b.	Illustrate how spread spectrum techniques enhance signal robustness.	CO-1	L2
c.	State the general idea behind random access protocols.	CO-2	L1
d.	Classify multiple access methods based on coordination.	CO-2	L2
e.	Define the purpose of switching in computer networks.	CO-3	L1
f.	Explain the structure of an IPv6 address.	CO-3	L2
g.	Interpret the output of a traceroute command.	CO-4	L2
h.	Summarize the main functions of Stream Control Transmission Protocol (SCTP).	CO-5	L2
i.	Appraise the advantages of HTTPS over HTTP.	CO-6	L2
j.	List the main components of an email system.	CO-6	L1
SECTION-B			
2.	Utilize the concept of multiplexing to show efficiency improvement.	CO-1	L3
3.	Analyze the role of CSMA/CA in wireless medium access.	CO-2	L4
4.	Interpret Stop and Wait ARQ and Go-Back-N ARQ with examples.	CO-3	L5
5.	Elaborate link state routing compared to distance vector routing.	CO-4	L6
6.	Apply the domain name system to show how names are resolved to IPs.	CO-6	L3

SECTION-C			
7.	Illustrate the working of multiplexing techniques such as FDM and TDM with diagrams.	CO-1	L3
8.	Make use of an example to apply the concept of process-to-process communication.	CO-4	L3
9.	Appraise congestion window adjustment strategies and justify their effect on throughput.	CO-5	L5

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Roll No.

Total No. of Pages: 01

Total No. of Questions: 09

B.Tech CSE, Semester-7th
DATA WAREHOUSING AND DATA MINING

Subject Code: BTCS 702-18

M.Code: 90488

Date of Examination: 05-05-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Name and define the term "data cube."	CO-1	L1
b.	Show the difference between OLTP and OLAP.	CO-1	L2
c.	Define data quality.	CO-2	L1
d.	Classify the various types of data mining challenges.	CO-2	L2
e.	Label any two data mining tasks.	CO-3	L1
f.	Interpret the results of a frequent pattern mining process.	CO-3	L2
g.	What does search engine ranking mean?	CO-4	L1
h.	Outline the main steps in hierarchical clustering.	CO-4	L2
i.	Recall the meaning of "locality" in web mining context.	CO-5	L1
j.	Show how hierarchy in the web aids content mining.	CO-5	L2
SECTION-B			
2.	Analyze the role of ETL (Extract, Transform, Load) in successful warehouse implementation.	CO-1	L4
3.	Construct a data cleaning workflow for sales transaction data.	CO-2	L3
4.	Assess the strengths and weaknesses of frequent pattern mining methods for large datasets.	CO-3	L5
5.	Analyze the effect of cluster validity on decision-making in data-driven businesses.	CO-4	L4
6.	Judge the advantages of hybrid web mining techniques for large dynamic sites.	CO-5	L5
SECTION-C			
7.	Develop an OLAP query processing scenario demonstrating efficient roll-up and drill-down operations.	CO-1	L4
8.	Analyze challenges in mining frequent patterns without candidate generation in massive datasets.	CO-3	L4
9.	Recommend a robust architecture for future enterprise search engines capable of handling exponential data growth and diverse formats	CO-4	L5

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Roll No.

Total No. of Questions: 09

B. Tech (AIML), Semester 7th

APPLIED INTELLIGENCE

Subject Code: BTAIML 709-20

M. Code: 93989

Date of Examination: 06-05-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION-B contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. SECTION C contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

Q. No.	Question	CO	BL
SECTION-A			
1.	Answer briefly:		
a.	Name the key evaluation metrics used in classification problems.	CO-1	L1
b.	Explain how random variables differ from deterministic variables.	CO-1	L2
c.	What are the function of the Kalman estimator in dynamic systems?	CO-2	L1
d.	Compare organizational impact on system design across industries.	CO-2	L2
e.	Explain the importance of Systems Engineering in modern project development.	CO-3	L1
f.	Illustrate the role of propositional logic in problem-solving.	CO-3	L2
g.	How logic is applied in representing engineering domain knowledge?	CO-4	L1
h.	Summarize the process of converting natural language statements into logical form.	CO-4	L2
i.	List the examples of deep learning applications in object detection?	CO-5	L1
j.	Illustrate how CNN extract features from image data?	CO-5	L2
SECTION-B			
2.	Compare the advantages and limitations of statistical versus machine learning approaches.	CO-1	L4
3.	Choose a simple model to represent the interaction between system components.	CO-2	L3
4.	Explain the validity of conclusions drawn from automated inference systems.	CO-4	L5
5.	Analyze the working of sensor networks step by step.	CO-3	L4
6.	Evaluate the performance of deep learning models using precision, recall, and F1-score.	CO-5	L5
SECTION-C			
7.	Examine how enhancing human competencies can improve the performance of system processes, and recommend strategies to effectively integrate human factors into system design and operation.	CO-2	L4
8.	Distinguish between syntax errors and semantic inconsistencies in logic expressions, and evaluate how each type of error affects logical validity, system interpretation, and execution outcomes.	CO4	L4
9.	Explain the effectiveness of various features of logic-based reasoning agents in achieving automated decision-making, and propose enhancements to improve performance in complex systems.	CO-1	L5

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Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (CSE), Semester 7th

NETWORK SECURITY AND CRYPTOGRAPHY

Subject Code: BTCS701-18

M.Code: 90487

Date of Examination: 20-04-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What is a zero-day vulnerability?	CO-1	L1
b.	Outline the basic components of conventional encryption.	CO-1	L2
c.	Define monoalphabetic cipher.	CO-2	L1
d.	Illustrate Fermat's theorem with an example.	CO-2	L2
e.	Why both confusion and diffusion are necessary in cryptography.	CO-3	L1
f.	Outline the key expansion process in AES.	CO-3	L2
g.	List the security services provided by digital signatures.	CO-4	L1
h.	Outline three main parties involved in the Kerberos authentication process.	CO-4	L2
i.	List two services provided by S/MIME.	CO-5	L1
j.	Illustrate a scenario where honeypots are useful.	CO-5	L2
SECTION-B			
2.	Identify the impact of malware threats (viruses, worms, Trojans, ransomware) on organizational security. How can these be prevented?	CO-1	L3
3.	Examine why prime numbers are the foundation of modern public-key cryptosystems. How does the difficulty of prime factorization contribute to cryptographic security?	CO-2	L4
4.	Explain the concept of Elliptic Curve Cryptography (ECC) and why it is considered secure.	CO-3	L5
5.	Analyze in detail the working of Digital Signatures in network security. Discuss the various attacks related to Digital Signatures.	CO-4	L4
6.	Evaluate the advantages and limitations of PGP in securing email communication.	CO-5	L5



SECTION-C			
7.	Compare active and passive attacks with respect to objectives, detection difficulty, and impact. Which category poses a greater long-term risk to organizations? Justify your answer.	CO-1	L4
8.	Make use of a block diagram to discuss the DES algorithm architecture. Describe the role of initial permutation, round function, key generation, and final permutation.	CO-3	L3
9.	Explain the MD5 algorithm step by step with a neat diagram. Show how it compresses input into a 128-bit digest.	CO-4	L5

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Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (AIML/AIDS), Semester 7th

COMPILER DESIGN

Subject Code: BTCS 601-18

M.Code: 93988

Date of Examination: 30-04-2026

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION-B contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. SECTION C contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define token, lexeme and pattern.	CO-1	L1
b.	Explain the structure of a compiler with a neat diagram.	CO-1	L2
c.	What is YACC tool used for?	CO-2	L1
d.	Outline any two limitations of LL(1) parser.	CO-2	L2
e.	Define Boolean expression translation.	CO-3	L1
f.	Differentiate between syntax tree and parse tree.	CO-3	L2
g.	What is non-local data access?	CO-4	L1
h.	Interpret the advantages of stack allocation.	CO-4	L2
i.	Define efficient data flow algorithm.	CO-5	L1
j.	Explain available expressions analysis.	CO-5	L2

