

Roll No.

Total No. of Pages: 2

Total No. of Questions: 09

B.Tech (CSE/ IT/ ME/ ECE/ IOT/ CS/ RAI/ AIML/ AIDS/ CSE DS), Semester: 1st

Subject Code: 25C1EMU-101

M.Code:

Date of Examination: 12-12-2025

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 D'Alembert's Ratio Test.	CO-1	L1
b.	Interpret whether the sequence $\{a_n\}$, where $a_n = \frac{2n-1}{(n+1)^2}$ is convergent or divergent.	CO-1	L2
c.	Explain Maclaurin's Theorem in one variable.	CO-1	L2
d.	Define Beta and Gamma function with their examples.	CO-2	L1
e.	Show that: $\int_0^{\infty} e^{-x^2} dx = \frac{\sqrt{\pi}}{2}$	CO-2	L2
f.	Show that: $\beta(m, n) = \beta(m, n+1) + \beta(m+1, n)$.	CO-2	L2
g.	Find stationary points of the function: $f(x, y) = x^2 + y^2 + 6x + 12$	CO-3	L1
h.	Explain the conditions for maxima and minima of a function of two variables.	CO-3	L2
i.	Find the value of: $\int_0^3 \int_0^1 (x^2 + 3y^2) dy dx$	CO-4	L1
j.	Infer the value of the integral: $\int_0^2 \int_1^2 \int_0^{yz} xyz dx dy dz$	CO-4	L2
SECTION-B			
2.	Examine the convergence/divergence of the series:	CO-1	L4

	$a_n = \sum \sqrt{\frac{n}{n^2+1}}$		
3.	Solve for the length of an arc of the cycloid: $x = a(\theta - \sin \theta)$ and $y = a(1 - \cos \theta)$	CO-2	L3
4.	If $u = x^y$, Prove that: $\frac{\partial^3 u}{\partial x^2 \partial y} = \frac{\partial^3 u}{\partial x \partial y \partial x}$	CO-3	L5
5.	Solve $\iint_A y \, dx \, dy$ where A is the region bounded by the parabolas $y^2 = 4x$ and $x^2 = 4y$	CO-4	L3
6.	If $z = \log(u^2 + 3v)$, $u = e^{5x^2+y^2}$, $v = e^{2x^2+7y}$, Determine $\frac{\partial z}{\partial x}$ and $\frac{\partial z}{\partial y}$	CO-3	L5
SECTION-C			
7.	(a) Analyse the length of the curve: $x = t^3, y = 2t^2$ on $[0, 1]$. (b) Simplify the integral: $\int_0^1 x^5 (1 - x^3)^3 \, dx$	CO-2	L4
8.	Solve $x^2 \frac{\partial^2 u}{\partial x^2} + 2xy \frac{\partial^2 u}{\partial x \partial y} + y^2 \frac{\partial^2 u}{\partial y^2}$, where $u = \tan^{-1}\left(\frac{y^2}{x}\right)$	CO-3	L3
9.	Evaluate $\iiint \frac{dx \, dy \, dz}{\sqrt{1-x^2-y^2-z^2}}$ over the positive octant of the sphere $x^2 + y^2 + z^2 = 1$	CO-4	L5

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Roll No.

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Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (CSE/IOT/ME), Semester 1st

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Subject Code: 25C1ECU-101

M.Code:

Date of Examination: 15-12-2025

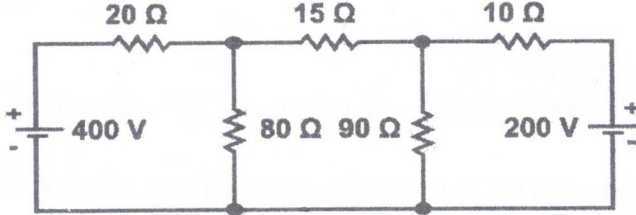
Max. Marks: 60

Time: 3 Hrs.

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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 active and passive elements with examples?	CO-1	L2
b.	Illustrate Norton's Theorem.	CO-1	L2
c.	Compare ideal and practical voltage sources.	CO-1	L2
d.	Define RMS value of an AC voltage.	CO-2	L1
e.	Summarize the difference between AC and DC circuit.	CO-2	L2
f.	Compare Real Power and Reactive Power.	CO-2	L2
g.	What are the properties of an ideal fuse?	CO-3	L1
h.	Explain voltage regulation with respect to transformer.	CO-3	L2
i.	A BJT has a β (current gain) of 100. If base current is $10 \mu\text{A}$, Find collector current.	CO-4	L1
j.	Explain the V-I characteristics of PN junction diode.	CO-4	L2
SECTION-B			
2.	State Kirchhoff's current and voltage law and apply them to any electric circuit. Also, mention the sign conventions used in Kirchhoff's laws.	CO-1	L3
3.	Examine the relation between line values and phase values of voltage and current for a 3-phase balanced star connected system. Draw the phasor diagram of these quantities.	CO-2	L4
4.	The iron loss and full load copper losses of 25KVA, 2000/200V single phase transformer are 200 watts and 400 watts. Determine a) the efficiency at full load and half load at 0.8 power factor lag. b) maximum efficiency and corresponding load at same power factor.	CO-3	L5

5.	Analyze the input and output characteristics of a BJT in Common Base (CE) configuration with the help of neat diagrams.	CO-4	L4
6.	Explain the important characteristics of Batteries. Also, explain the types of batteries with the help of suitable diagrams.	CO-3	L5
SECTION-C			
7.	Utilize Thevenin's Theorem to find the current in 15Ω resistor of network as shown in figure below. 	CO-1	L3
8.	Make use of suitable diagrams to show the working of following electrical components a) MCB b) SFU	CO-3	L3
9.	Explain the working principle of thermistor and thermocouple with suitable diagrams.	CO-4	L5

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i.	Define absolute convergence with the help of an example.	CO1	L1
j.	Show that Beta function is symmetric.	CO2	L1
SECTION-B			
2.	Analyse the convergence or divergence of the series $\sum (\sqrt[3]{n^3 + 1} - n)$.	CO1	L4
3.	Solve the cardioid $r = a(1 - \cos \theta)$ for finding the perimeter	CO2	L3
4.	If $u = \sin^{-1} \left(\frac{x^2 + y^2}{x + y} \right)$, prove that $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = \tan u$.	CO3	L5
5.	Solve $\iint_A y \, dx \, dy$ where A is the region bounded by the parabolas $y^2 = 4x$ and $x^2 = 4y$.	CO4	L3
SECTION-C			
6.	Examine the convergence of the series $\sum \frac{(-1)^{n-1} n}{5n+1}$.	CO1	L4
7.	Prove the relation between Beta and Gamma functions.	CO2	L5
8.	If $u = f \left(\frac{y-x}{xy}, \frac{z-x}{xz} \right)$, then solve $x^2 \frac{\partial u}{\partial x} + y^2 \frac{\partial u}{\partial y} + z^2 \frac{\partial u}{\partial z}$	CO3	L3
9.	Simplify $\iiint (x + y + z) \, dx \, dy \, dz$ over the tetrahedron bounded by the planes $x = 0, y = 0, z = 0, x + y + z = 1$.	CO4	L4

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SECTION-B			
2.	Apply Taylor's Theorem with Lagrange's form of remainder to the function $f(x)=\sin x$ in $[\pi/2, x]$.	CO1	L3
3.	Solve $\lim_{x \rightarrow 0} \left(\frac{1}{x^2}\right)^{\tan x}$	CO2	L3
4.	Examine the L.I or L.D of the system of vectors $(2, -1, 3)$, $(8, 2, 0)$ and $(0, 1, -2)$. Find the relation between them.	CO3	L4
5.	Determine the inverse of matrix $\begin{bmatrix} 1 & 0 & 2 \\ 2 & -1 & 3 \\ 4 & 1 & 5 \end{bmatrix}$ using Gauss Jordan Method.	CO4	L5
SECTION-C			
6.	Inspect that $\beta(m, n) = \frac{(m-1)! (n-1)!}{(m+n-1)!} : m, n > 0 \text{ and } m, n \in \mathbb{Z}$	CO1	L4
7.	Prove that the height of a cylinder, which is open at the top having a given surface and greatest volume, is equal to the radius of its base.	CO2	L5
8.	If W be the subspace of all the vectors $(a, 0, b)$ for all reals a and b . Solve Basis and Dimension of W .	CO3	L3
9.	Inference that similar matrices have same eigen values.	CO4	L4

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Total No. of Pages: 02

Total No. of Questions: 09

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

CHEMISTRY-I

Subject Code: BTCH101-18

M.Code: 75343

Date of Examination: 02-12-2025

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.	What are chromophores? Give example.	CO3	L1
b.	Outline dry corrosion of metals.	CO2	L2
c.	Recall the term penetration of orbitals.	CO4	L1
d.	Why Electron gain enthalpy of noble gases comes out to be positive?	CO4	L1
e.	Show dipole-dipole interactions through example.	CO1	L2
f.	List differences between enantiomers and diastereomers.	CO6	L1
g.	Show Anti-Markovnikoff addition of water in alkenes.	CO5	L2
h.	Label R and S configuration to the following: <div style="text-align: center;">$\begin{array}{c} \text{CH}_3\text{Cl} \\ \\ \text{H}_3\text{CH}_2\text{C} - \text{C} - \text{CHO} \\ \\ \text{Br} \end{array}$</div>	CO6	L1
i.	Summarize about optical activity of organic compounds.	CO3	L2
j.	Classify and name various types of organic reactions.	CO5	L2
SECTION-B			
2.	Assess Crystal field splitting in tetrahedral complexes through proper diagram. Also calculate CFSE for d^4 and d^6 configurations for tetrahedral complexes.	CO1	L5
3.	(a) Solve the Nernst equation for the electrochemical cell. Also give its various applications.		

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	(b) Model working of ion-exchange process for water softening.	CO2	L3
4.	(a) Explain electrochemical wet theory of corrosion along with appropriate reactions. (b) Describe the Van der Waals constants and critical constants, and illustrate the relationship between them along with the importance of Van der Waals constants.	CO2	L2
5.	(a) Analyze and illustrate the expected ^1H NMR spectra of butan-2-ol and 2-chloropropane, interpreting the splitting patterns. (b) Examine different transitions possible in UV spectroscopy through suitable examples.	CO3	L4
SECTION-C			
6.	a) Deduce different conformations of propane molecule through Newmann projection formulae. b) Compare meso compounds and racemic mixtures giving suitable examples.	CO6	L5
7.	Solve Schrodinger wave equation for particle in 1-dimensional box. Also discuss its applications for calculating ΔE of conjugated dienes.	CO1	L3
8.	(a) Examine the shapes of NH_3 and H_2O as predicted by VSEPR theory, and analyze the factors responsible for their different geometries. (b) Analyze the HSAB principle and polarizability, explaining how they help in understanding the nature of soft and hard acids and bases.	CO4	L4
9.	Apply your understanding of organic reaction mechanisms to explain the stepwise processes involved in E_1 and E_2 substitution reactions, including their influencing factors such as the nature of the substrate, solvent, nucleophile strength, and leaving group ability, with suitable examples.	CO5	L3

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Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

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

CHEMISTRY-I

Subject Code: BTCH101-23

M.Code: 93800

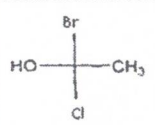
Date of Examination: 02-12-2025

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.	Why is TMS used as an internal standard in NMR spectroscopy.	CO3	L1
b.	Outline dry corrosion of metals.	CO2	L2
c.	Recall effective nuclear charge term.	CO4	L1
d.	Why halogens have highest electron affinity in the periodic table?	CO4	L1
e.	How atomic radii varies along the period in the periodic table?	CO1	L1
f.	Outline position isomerism with an example.	CO6	L1
g.	Infer about electrophiles through examples.	CO5	L2
h.	Label R and S configuration to the following: 	CO6	L1
i.	Illustrate the terms: Bathochromic shift and Hypsochromic shift.	CO3	L2
j.	Demonstrate free radical substitution reaction in alkanes.	CO5	L2
SECTION-B			
2.	Construct the molecular orbital diagram for N ₂ molecule and by making use of MOT compare (a) stability (b) Bond order (c) bond length (d) magnetic behavior of N ² , N ²⁺ and N ²⁻ species.	CO1	L5

3.	(a) The e.m.f of a cell reaction $3\text{Sn}^{4+} + 2\text{Cr} \rightarrow 2\text{Cr}^{3+} + 3\text{Sn}^{2+}$ is 0.89. Determine the standard Free energy for this reaction. (b) Model working of lime-soda process for water softening.	CO2	L3
4.	(a) Explain the mechanism of Electrochemical wet theory of corrosion along with appropriate reactions. (b) Describe the methods of prevention of corrosion.	CO2	L2
5.	(a) Analyze the number of signals for the following compounds: (i) CH ₃ -CH ₂ -O-CH ₃ (ii) CH ₃ -CH ₂ -CH ₂ -OH (b) Examine different types of molecular vibrations in IR spectroscopy.	CO3	L4
SECTION-C			
6.	(a) Deduce different conformations possible for propane molecule and also discuss their stability. (b) Explain meso compounds? Give atleast one example.	CO6	L5
7.	Solve Schrodinger wave equation upto laplacian operator. Also discuss the physical significance of ψ and ψ^2 .	CO1	L3
8.	Analyze the (a) geometry (b) shape (c) bond angle (d) number of bond pairs and (e) lone pairs of these following molecules: H ₂ O, SF ₆ , CH ₄ and NH ₃ by applying VSEPR theory.	CO4	L4
9.	Construct the pathway for the synthesis of Aspirin from salicylic acid. Also, give applications of aspirin drug molecule.	CO5	L3

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B.Tech (All Branches), (Sem.-1, 2)
BASIC ELECTRICAL ENGINEERING
 Subject Code: BTEE101-18
 M.Code: 93797/75339
 Date of Examination: 26-11-2025

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 & 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.	Compare active and passive elements.	CO1	L2
b.	Explain superposition's theorem.	CO1	L2
c.	What is the effect of frequency on inductive reactance?	CO2	L1
d.	Compare DC and AC.	CO2	L2
e.	Define magnetic materials and provide examples.	CO3	L1
f.	Illustrate the significance of torque-slip characteristics in case of an electrical machine.	CO3	L2
g.	What is the difference between wire & cable?	CO4	L1
h.	List the properties of ideal fuse wire.	CO4	L1
i.	What is the importance of power factor?	CO2	L1
j.	Define voltage regulation for a transformer.	CO3	L1
SECTION-B			
2.	Examine the transient analysis of first order RL series circuit. Also sketch the graphical representation of RL series circuit.	CO1	L4
3.	Solve for current through $10\ \Omega$ using Norton's theorem.	CO1	L3

4.	Explain the series resonance and its effects in RLC series circuit with suitable diagrams.	CO2	L5
5.	A resistance of $12\ \Omega$ and inductance of 0.1H are connected in series across a 220V , 100Hz supply. Solve for a) Impedance of the circuit. b) Current flowing through the circuit. c) Power factor. d) Power consumed in the circuit.	CO2	L3
SECTION-C			
6.	The iron loss and full load copper losses of 25KVA , $2000/200\text{V}$, single phase transformer are 200 watts and 400 watts respectively. Solve (a) the efficiency at full load and half load at 0.8 power factor lag. (b) maximum efficiency and corresponding load at same power factor.	CO3	L3
7.	Explain the construction and working principle of 3-phase induction motor with the help of neat diagram.	CO3	L5
8.	Analyze the important characteristics of batteries in electrical installation. Using suitable diagrams, explain the different types of batteries.	CO4	L4
9.	Examine the function of a miniature circuit breaker with the help of neat schematic diagram.	CO4	L4

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	10^{-6} m and cavity temperature $T = 100\text{K}$ and hence evaluate which type of emission will dominate.		
SECTION-C			
7.	Compare the operational characteristics of various diode types—(a) PN diode (b) Zener (c) LED (d) Photodiode—in terms of their forward voltage, breakdown behavior.	CO-1	L4
8.	(a) Utilize Schrodinger's wave equation for finding the energy of a free particle in a one-dimensional box. (b) Find the value of wave function using normalization condition.	CO-3	L3
9.	Explain the working, construction and energy level diagram for He-Ne laser. Also explain its advantages and applications.	CO-4	L5

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B.Tech (All Branches), (Sem. -1, 2)
ENGINEERING PHYSICS
Subject Code: BTPPH101-23

M.Code: 93794

Date of Examination: 18-11-2025

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 & 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 a Unit Cell.	CO1	L1
b.	What do you mean by extrinsic semiconductor?	CO2	L1
c.	List two unusual properties of nanomaterials.	CO3	L1
d.	Find the gradient of $1/r^2$ where $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$.	CO4	L1
e.	Explain the physical significance of a wave function.	CO5	L2
f.	What is Holography?	CO6	L1
g.	Illustrate the properties of X-rays.	CO1	L2
h.	Explain Magnetic anisotropy.	CO3	L2
i.	Compare the condition for the vector F to be solenoidal and vector F to be irrotational.	CO4	L2
j.	What is Uncertainty Principle?	CO5	L1
SECTION-B			
2.	Identify the wavelength of X-ray using Bragg's Spectrometer. Also find the minimum wavelength of continuous X-ray emitted from an X-Ray tube with operating voltage of 24kV.	CO1	L3
3.	Examine the function of Zener diode as a voltage regulator.	CO2	L4
4.	Utilize the principles of superconductivity to compare the behavior of Type-I and Type-II superconductors and explain their soft and hard nature.	CO3	L3
5.	Explain the construction and working of Ruby laser with the help of energy level diagram. Also explain spiking in ruby laser.	CO6	L5

SECTION-C

6.	Solve the Schrodinger wave equation for particle in 1-D box and show that energy of particle in a box is quantized.	CO5	L3
7.	Distinguish between step index and graded index optical fiber.	CO6	L4
8.	a) Classify the four Maxwell equation in their differential and integral form. Also give the physical significance of each equation. b) Dissect the concepts of dielectric polarization and displacement current.	CO4	L4
9.	Explain the construction and working of Photodiode. Give its disadvantages.	CO2	L5

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Roll No.

Total No. of Questions: 09

Total No. of Pages:04

B.Tech (AI&ML/AI&DS/ECE/IT/RAI/CSE-CS/CSE-DS), Semester 1st

ENGLISH & PROFESSIONAL COMMUNICATION

Subject Code: 25C1EPU-101

M.Code:

Date of Examination: 23-12-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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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 the sentence that contains a cliché: i. Actions speak louder than words. ii. Consistent effort often outweighs empty promises.	CO-1	L1
b.	Interpret the mistakes in the given abbreviations and rewrite correctly: "CIA-Central Intelligence Agency" , "LAN- Live Area Network"	CO-1	L2
c.	Find and fix the noun-pronoun disagreement in the given sentences: i. The mangoes are very sour. Where did you buy it? ii. The army has reached its destination.	CO-2	L1
d.	Interpret and fix the misplaced modifiers in the given sentences: i. My brother only has two children. ii. Reading a book frequently will change the whole course of a man's life.	CO-2	L2
e.	List any two features of a precise writing.	CO-3	L1
f.	"Effective writing is always clear, engaging, and purposeful." Interpret the reason.	CO-3	L2
g.	Outline the ways by which the regular practice of reading comprehension exercises strengthen critical thinking abilities.	CO-4	L2

h.	Interpret what happens when a piece of writing has a weak introduction compared to one with a strong introduction.	CO-5	L2
i.	Interpret any two reasons regarding the importance of good presentation skills in professional settings.	CO-6	L2
j.	Show with an example the way of writing a heading in a business letter when the name and designation both are given.	CO-6	L1
SECTION-B			
2.	a. Choose the word from the options which best expresses the meaning of the given words: i. ABUNDANT: _____ (Options: scarce, plentiful, moderate, limited) ii. PERSEVERANCE: _____ (Options: Giving up, laziness, persistence, confusion) ii. ACHIEVE: _____ (Options: Fail, attempt, accomplish, begin) b. Choose the word from the options which conveys the antonym of the given words: i. EXPAND: _____ (Options: Grow, stretch, contract, increase) ii. PARTIAL: _____ (Options: Complete, some, half, limited)	CO-1	L3
3.	Examine and correct the redundancy in the following sentences: i. The CEO gave a free complimentary gift to each and every employee in the company. ii. In my personal opinion, I think we should postpone the meeting until a later time in the future. iii. The students gathered together in a small little group to collaborate together on their joint project assignment. iv. She returned back to her house at 10 a.m. in the morning to repeat the same routine again. v. The witness repeated the same story again during the trial.	CO-2	L4
4.	Read the following passage and do as directed: i. Deduct the words/ sentences from the passage to form a precis. ii. Paraphrase this passage. In today's fast paced world, maintaining a healthy lifestyle has become increasingly challenging. With busy schedules, people often neglect physical activity and opt for quick, unhealthy meals. This has led to a rise in lifestyle related diseases such as obesity, diabetes, and heart problems. However, incorporating regular exercise and a balanced diet can significantly improve overall health. Simple changes like	CO-3	L5

	walking more, choosing nutritious foods, and reducing stress can make a big difference. It is essential to prioritize health to lead a fulfilling life.		
5.	<p>Read the following paragraph and choose the correct answer from the paragraph for the questions that follow:</p> <p>The rapid advancement of technology has created an unprecedented divide between generations, fundamentally altering how different age groups communicate, learn, and perceive the world around them. While younger generations, often called "digital natives," have grown up immersed in smartphones, social media, and instant connectivity, older generations frequently struggle to adapt to these technological changes. This generational gap extends beyond mere comfort with gadgets—it reflects deeper differences in attention spans, information processing, and social interaction patterns. Young people tend to multitask efficiently, absorbing information in short bursts from multiple sources simultaneously, whereas older individuals often prefer focused, linear learning approaches. However, this technological divide isn't entirely one-sided. While younger generations excel at navigating digital platforms, they sometimes lack the deep analytical skills and patience for sustained concentration that older generations possess. Moreover, excessive reliance on technology has led to concerns about decreased face-to-face communication skills and shortened attention spans among youth. The challenge for society lies not in choosing sides, but in finding ways to bridge this gap, allowing each generation to learn from the other's strengths while addressing their respective weaknesses.</p> <p>Questions:</p> <p>i. Analyze the main argument presented in this paragraph. What is the author's central idea/thesis about the digital generation gap?</p> <p>ii. Identify and explain two specific differences between younger and older generations mentioned in the text. How do these differences affect their daily lives?</p> <p>iii. The author states that "this technological divide isn't entirely one-sided." Analyze its meaning and provide evidence from the paragraph to support this claim.</p> <p>iv. Analyze the solution proposed by the author in the final sentence. Do you think this approach is realistic? Give your view point.</p> <p>v. Give antonyms of "excessive" and "deep".</p>	CO-4	L5

6.	Make use of professional email writing etiquettes and draft an email to your boss requesting him for your promotion from Junior Manager to a Senior Manager.	CO-6	L3
SECTION-C			
7.	<p>Make use of the appropriate subject-verb agreement rules and correct the following sentences:</p> <p>i. The man and the woman has absconded.</p> <p>ii. A dictionary and an atlas is missing from the library.</p> <p>iii. The children as well as their mother is missing.</p> <p>iv. Neither the students nor the teacher are satisfied with the results.</p> <p>v. The list of complaints have been submitted.</p>	CO-2	L3
8.	Identify ways to develop good and catchy content writing skills and explain how these skills can be applied to create engaging blogs, social media posts, or articles that attract readers.	CO-5	L3
9.	You are Priya Sharma, a resident of Greenfield Apartments, Sector 15, Chandigarh. You have been facing frequent power outages in your residential area for the past three weeks. The electricity cuts occur daily between 6:00 PM to 10:00 PM, which is peak usage time for families. This has caused significant inconvenience as children cannot study properly, food gets spoiled due to refrigerator shutdowns, and online work from home has become impossible. Explaining all the problems write a complaint letter to the Chief Engineer, Chandigarh Electricity Board, Sector 9, Chandigarh - 160009.	CO-6	L5

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	for the input values, and construct the logic to display the result using pointer operations. b. Explain pointer and its functionality.		
8.	Explain bubble sort as a comparison-based sorting technique and write its algorithm and working with an example program in C.	CO-5	L3
9.	Choose and explain an appropriate structure in C to represent 15 student's record containing roll number, name, and marks. Determine how to input and store details of 15 students, then evaluate the correctness by displaying the stored data. Select the proper use of structures and loops to implement the solution.	CO-6	L4

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Roll No.

Total No. of Pages: 2

Total No. of Questions: 09

B.Tech (CSE/IT/AIML/AIDS), (Sem.-1, 2)

SEMICONDUCTOR PHYSICS

Subject Code: BTPH104-18

M.Code: 75360

Date of Examination: 18-11-2025

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 & 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.

SECTION-C

6.	Analyze the energy-state relationships in a three-dimensional system to derive the expression for the density of states.	CO1	L4
7.	Apply the concept of Fermi level to illustrate its variation with temperature in intrinsic and extrinsic semiconductors.	CO2	L3
8.	a)Examine the role of phonon density of states in solids. b)Analyze how population inversion enables laser action.	CO3	L4
9.	Explain the principle and procedure for any one method to measure the wavelength of Laser.	CO4	L5

Q.No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Summarize Weidmann-Franz Law.	CO1	L2
b.	Find the temperature at which 4% probability that state with energy $2eV$ is occupied. Given that fermi energy is $1.5 eV$.	CO1	L1
c.	Explain drift and diffusion currents.	CO2	L2
d.	Define depletion region.	CO2	L1
e.	What are photovoltaic devices?	CO3	L1
f.	Illustrate the concept of Excitons.	CO3	L2
g.	What is Hall effect?	CO4	L1
h.	Define Divergence.	CO4	L1
i.	Classify Direct and indirect band gap semiconductors.	CO1	L2
j.	Explain charge carrier generation and recombination processes.	CO2	L2
SECTION-B			
2.	Explain in detail (with diagrams) the origin of the bandgap in solids using the Bloch's theorem for particles in periodic potential.	CO1	L5
3.	Distinguish between intrinsic and extrinsic semiconductors.	CO2	L4
4.	Apply the concepts of stimulated absorption, spontaneous emission, and stimulated emission to construct and interpret the relationship among Einstein's coefficients.	CO3	L3
5.	Construct and explain the schematic of the hot-point probe setup, applying its basic principle to identify semiconductor type.	CO4	L3

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	द्विआयुष्य मनुष्यी त्रीते दी पुत्रती दे संतवड द्विच भंन ममान दी मध्वी दी दी द्विआयुष्य वते।	CO4	L4
5.	List the four orders of nature. Also, analyze the interconnectiveness and mutual fulfillment in four orders of nature with examples. प्रकृति के चार क्रमों की सूची बनाएँ। इसके अलावा, उदाहरणों के साथ प्रकृति के चार क्रमों में परस्पर जुड़ाव और आपसी पूर्ति का विश्लेषण करें। वृत्तवट दे चार आयुष्य दी सुची घटाएँ। नाल ती, उतावटवट दे नाल वृत्तवट दे चार आयुष्य द्विच पवमपव मंषंषं भडे आयुष्यी पुत्रती टा द्विसलेसट वते।	CO4	L4
6.	Apply ethical principles to identify current issues in professional ethics and list five unethical practices along with the methods used to curb them. देशवर नैतिकता में वर्तमान मुद्दों की पहचान करने के लिए नैतिक सिद्धांतों को लागू करें और उन पर अंकुश लगाने के लिए उपयोग किए जाने वाले तरीकों के साथ पांच अनैतिक प्रथाओं को सूचीबद्ध करें। पुसवट नैतिकता द्विच भैनुटा पुंदिआं दी पढाट वरन लयी नैतिक मियंउं नुं छावु वते भडे उतां नुं वेवट लयी वरते नाल उतीविआं दे नाल पंन भनैतिक भविआं दी सुची घटाएँ।	CO5	L3
SECTION-C			
7.	Explain in detail various basic requirements to fulfil human aspiration. मानव आकांक्षाओं को पूरा करने के लिए विभिन्न बुनियादी आवश्यकताओं को विस्तार से समझाइए। मनुष्यी द्विहटां नुं पुत्रा वरन लयी देव देव घुनिआपी नवुवउं घावे द्विसवट द्विच टंषी।	CO2	L5
8.	Identify the differences between human and animal consciousness, and how 'shiksha' and 'sanskar' help transform a person toward human consciousness. मानव और पशु चेतना के बीच अंतर की पहचान करें, और कैसे 'शिक्षा' और 'संस्कार' एक व्यक्ति को मानव चेतना की ओर बदलने में मदद करते हैं। मनुष्यी भडे पशु चेतना टरमिआन भंउउं दी पढाट वते, भडे विदे 'शिक्षा' भडे 'संस्कार' द्विच द्विआवती नुं मनुष्यी चेतना देल घटावट द्विच भट्ट वरते वन।	CO3	L3
9.	Determine the concept of an undivided society and the universal order and explain how both these can help to create a world family. एक अविभाजित समाज और सार्वभौमिक व्यवस्था की अवधारणा का निर्धारण करें और समझाएं कि ये दोनों कैसे एक विश्व परिवार बनाने में मदद कर सकते हैं।	CO4	L5

	द्विच भट्ट ममान भडे मवघद्विआपी द्विचमषा दी पावना नुं निवपावट वते भडे मभघादि वि द्विच देहे द्विच द्विसट पविचर घटाछिद द्विच विदे भट्ट वर मवटे वन।	CO5	L4
10.	Analyze the universal human order and examine your role in progressing toward it. सार्वभौमिक मानव व्यवस्था का विश्लेषण करें और इस दिशा में आपो बढ़ने में अपनी भूमिका की जांच करें। मवघद्विआपी मनुष्यी द्विचमषा टा द्विसलेसट वते भडे द्विस देल टपट द्विच आयुष्यी बुनिवा दी नच वते।	CO5	L4
11.	Explain self-organization and health. Evaluate their role in achieving the harmony in nature. स्व-संगठन और स्वास्थ्य की व्याख्या कीजिए। प्रकृति में सामंजस्य प्राप्त करने में उनकी भूमिका का मूल्यांकन करें। मदे-संगठन भडे मिवड दी द्विआयुष्य वते। वृत्तवट द्विच मट्टावटन पुपड वरन द्विच उतां दी बुनिवा टा मुलवट वते।	CO1	L5

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3.	Test for the matrix $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 3 & -1 \\ 0 & -1 & 3 \end{bmatrix}$ is diagonalizable or not.	CO3	L4
4.	Solve the partial differential equation $r - 4s + 4t = e^{2x+y}$.	CO6	L3
5.	Analyze the system of linear equations $x + y + z = 6, x + 2y + 3z = 10, x + 2y + kz = \lambda$ by examining the relationships among the coefficients, for which values of k and λ possesses (i) No solution (ii) Unique solution (iii) Infinite number of solutions.	CO1	L4
SECTION-C			
6.	Let $V(R)$ be the vector space of all 2×2 matrices and T be a linear operator on $V(R)$ such that $T(v) = Mv$, where $v \in V(R)$ and $M = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$. Construct the matrix of T relative to standard basis of $V(F)$.	CO2	L3
7.	Evaluate the matrices P and Q such that PAQ is in the normal form where A is the matrix $\begin{bmatrix} 1 & 1 & 2 \\ 1 & 2 & 3 \\ 0 & -1 & -1 \end{bmatrix}$.	CO1	L5
8.	Inspect the form of equation $(p + q)(px + qy) = 1$ and identify the reasoning that leads to complete solution.	CO4	L4
9.	If the displacement of a particle moving at any time t is given by $x = a \cos kt + b \sin kt$, show that the point executes simple harmonic motion. Also determine i) amplitude ii) the maximum velocity iii) the maximum acceleration iv) the periodic time.	CO5	L5

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3.	Test for the matrix $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 3 & -1 \\ 0 & -1 & 3 \end{bmatrix}$ is diagonalizable or not.	CO3	L4
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SECTION-C			
6.	Let $V(R)$ be the vector space of all 2×2 matrices and T be a linear operator on $V(R)$ such that $T(v) = Mv$, where $v \in V(R)$ and $M = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$. Construct the matrix of T relative to standard basis of $V(F)$.	CO2	L3
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	X	0	1	2	3	4			
	F	30	62	46	10	2			
3.	From the following data determine “r” and the two regression equations							CO3	L5
	X	1	2	3	4	5			
	Y	2	5	3	8	7			
4.	Find mean, standard deviation and coefficient of variation for the data given below:							CO1	L4
	Marks	0-10	10-20	20-30	30-40	40-50	50-60		
	No. of students	5	10	25	30	20	10		
5.	The average income in a sample of 100 people of a city A was Rs.210 with a standard deviation of Rs.10. For another sample of 150 persons from city B, the average income was Rs.220 with a standard deviation of Rs.12. Test whether there is any significant difference between average incomes of two cities?							CO4	L4
SECTION-C									
6.	The number of road accidents per week in a certain city were as follows: 12, 8, 20, 2, 14, 10, 15, 6, 9, 4. Are these frequencies in agreement with the belief that numbers of accidents were uniformly distributed during this 10 week period?							CO4	L5
7.	Solve for $E(X)$ and $E[X - E(X)]^2$ for the following probability distribution.							CO2	L3
	X :	8	12	16	20	24			
	P(X) :	1/8	1/6	3/8	1/4	1/12			
8.	Analyze skewness and kurtosis for the following data.							CO1	L4
	Marks	5-15	15-25	25-35	35-45	45-55			
	No. of students	1	3	5	7	4			
9.	Using suitable method of correlation evaluate coefficient of correlation for the marks given by							CO3	L5
	Judge A								
		10	15	15	20	18	16	15	
	Judge B								
		16	18	16	20	20	18	12	

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Total No. of Pages: 02

Total No. of Questions: 09

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

Subject Code: BTAM302-23

M.Code: 94630

Date of Examination: 03-12-2025

Max. Marks: 60

Time: 3 Hrs.

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 Kurtosis?	CO-1	L1																				
b.	If arithmetic mean is 56.50, median is 59.50 and standard deviation is 12.40. Find the skewness.	CO-1	L2																				
c.	Two cards are drawn at random from a well-shuffled pack of 52 cards. What is the probability of drawing two aces?	CO-2	L1																				
d.	If A, B and C are three mutually exclusive and exhaustive events associated with random experiments. Find P(A) given that $P(B) = \frac{3}{2}P(A), P(C) = \frac{1}{2}P(B)$	CO-2	L2																				
e.	Explain any two properties of Binomial Distribution.	CO-3	L1																				
f.	If the probability of defective bolt is 0.1, find the S.D. for the defective bolt in a total of 400.	CO-3	L2																				
g.	Define Correlation.	CO-4	L1																				
h.	If the regression coefficient of Y on X is 0.8 and that of X on Y is 0.5, find the correlation coefficient.	CO-4	L2																				
i.	Define Type-I and Type-II errors.	CO-5	L1																				
j.	A sample of 400 male students is found to have a mean height of 67.47 inches. Can it be reasonably regarded as sample from a large population with mean height 67.39 inches and S.D. 1.30 inches?	CO-5	L2																				
SECTION-B																							
2.	Calculate the first four moments about mean for the following data: <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="padding: 2px;">X:</td> <td style="padding: 2px;">1</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">3</td> <td style="padding: 2px;">4</td> <td style="padding: 2px;">5</td> <td style="padding: 2px;">6</td> <td style="padding: 2px;">7</td> <td style="padding: 2px;">8</td> <td style="padding: 2px;">9</td> </tr> <tr> <td style="padding: 2px;">F:</td> <td style="padding: 2px;">1</td> <td style="padding: 2px;">6</td> <td style="padding: 2px;">13</td> <td style="padding: 2px;">25</td> <td style="padding: 2px;">30</td> <td style="padding: 2px;">22</td> <td style="padding: 2px;">9</td> <td style="padding: 2px;">5</td> <td style="padding: 2px;">2</td> </tr> </table>	X:	1	2	3	4	5	6	7	8	9	F:	1	6	13	25	30	22	9	5	2	CO-1	L4
X:	1	2	3	4	5	6	7	8	9														
F:	1	6	13	25	30	22	9	5	2														

3.	A random variable X has the following probability distribution <table border="1"> <tr> <td>X</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>P(X)</td> <td>k</td> <td>3k</td> <td>5k</td> <td>7k</td> <td>9k</td> <td>11k</td> <td>13k</td> </tr> </table> Solve: (a) the value of k (b) $P(X \geq 4)$ and $P(2 < X \leq 5)$	X	0	1	2	3	4	5	6	P(X)	k	3k	5k	7k	9k	11k	13k	CO-2	L3										
X	0	1	2	3	4	5	6																						
P(X)	k	3k	5k	7k	9k	11k	13k																						
4.	In a normal distribution 31% of items are under 45 and 8% of items are over 64. Evaluate mean and standard deviation of the distribution.	CO-3	L5																										
5.	Calculate rank correlation coefficient from the following data <table border="1"> <tr> <td>X</td> <td>12</td> <td>15</td> <td>18</td> <td>20</td> <td>16</td> <td>15</td> <td>18</td> <td>22</td> <td>15</td> <td>21</td> <td>18</td> <td>15</td> </tr> <tr> <td>Y</td> <td>10</td> <td>18</td> <td>19</td> <td>12</td> <td>15</td> <td>19</td> <td>17</td> <td>19</td> <td>16</td> <td>14</td> <td>13</td> <td>17</td> </tr> </table>	X	12	15	18	20	16	15	18	22	15	21	18	15	Y	10	18	19	12	15	19	17	19	16	14	13	17	CO-4	L4
X	12	15	18	20	16	15	18	22	15	21	18	15																	
Y	10	18	19	12	15	19	17	19	16	14	13	17																	
6.	Two types of drugs were used to control the high blood pressures on 6 and 8 patients and decreases in systolic blood pressures (upper limit of B.P.) are as below: <table border="1"> <tr> <td>Drug A</td> <td>12</td> <td>18</td> <td>30</td> <td>15</td> <td>7</td> <td>14</td> <td></td> <td></td> </tr> <tr> <td>Drug B</td> <td>15</td> <td>16</td> <td>12</td> <td>10</td> <td>21</td> <td>25</td> <td>28</td> <td>17</td> </tr> </table> Interpret if there is any significant difference in the efficiency of drugs?	Drug A	12	18	30	15	7	14			Drug B	15	16	12	10	21	25	28	17	CO-5	L5								
Drug A	12	18	30	15	7	14																							
Drug B	15	16	12	10	21	25	28	17																					
SECTION-C																													
7.	From the following data calculate Karl Pearson's coefficient of skewness: <table border="1"> <tr> <td>Marks (more than)</td> <td>0</td> <td>10</td> <td>20</td> <td>30</td> <td>40</td> <td>50</td> <td>60</td> <td>70</td> <td>80</td> </tr> <tr> <td>No. of students</td> <td>150</td> <td>140</td> <td>100</td> <td>80</td> <td>80</td> <td>70</td> <td>30</td> <td>14</td> <td>0</td> </tr> </table>	Marks (more than)	0	10	20	30	40	50	60	70	80	No. of students	150	140	100	80	80	70	30	14	0	CO-1	L4						
Marks (more than)	0	10	20	30	40	50	60	70	80																				
No. of students	150	140	100	80	80	70	30	14	0																				
8.	If the probability that an individual suffers a bad reaction from a certain injection is 0.001. Evaluate the probability that out of 2000 individuals. (a) exactly 3 individuals will suffer a bad reaction (b) none will suffer a bad reaction (c) more than one individual will suffer (d) more than two individual will suffer	CO-3	L5																										
9.	Given the following data on sales and purchase <table border="1"> <tr> <td>Sales</td> <td>91</td> <td>97</td> <td>108</td> <td>121</td> <td>67</td> <td>124</td> <td>51</td> <td>73</td> <td>111</td> <td>57</td> </tr> <tr> <td>Purchase</td> <td>71</td> <td>75</td> <td>69</td> <td>97</td> <td>70</td> <td>91</td> <td>39</td> <td>61</td> <td>80</td> <td>47</td> </tr> </table> (a) Obtain regression equations Y on X and X on Y. (b) Calculate coefficient of correlation. (c) Estimate Y when X is 88 and X when Y is 56.	Sales	91	97	108	121	67	124	51	73	111	57	Purchase	71	75	69	97	70	91	39	61	80	47	CO-4	L3				
Sales	91	97	108	121	67	124	51	73	111	57																			
Purchase	71	75	69	97	70	91	39	61	80	47																			

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.

SECTION-C

7.	Justify the use of friend functions over member functions in operator overloading. Support your justification with a suitable C++ example and evaluate the situations where friend functions provide greater flexibility.	CO-2	L5
8.	Analyze the effect of access specifiers (public, protected, private) on reusability, flexibility, and extensibility of derived classes. In your opinion, which access mode leads to better design practices? Justify your evaluation with reasons.	CO-3	L4
9.	Evaluate the role of polymorphism in C++ by comparing early and late binding with examples.	CO-4	L5

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Roll No.

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

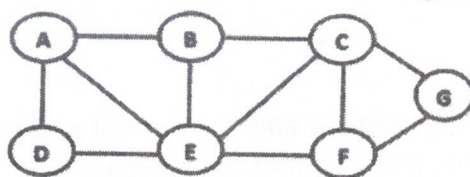
Date of Examination: 09-12-2025

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 basic operations performed on data structures.	CO-1	L1
b.	Explain what a Priority Queue is and describe how it differs from a normal queue.	CO-1	L2
c.	List how Stacks and Queues are represented in data structure.	CO-2	L1
d.	Explain why stack is called a LIFO data structure.	CO-2	L2
e.	State the properties of a Binary Search Tree (BST).	CO-3	L1
f.	Differentiate between min-heap and max-heap with an example.	CO-3	L2
g.	Define chaining as a method for handling collisions in hashing with example.	CO-4	L1
h.	Contrast and compare between Linear Search and Binary Search .	CO-4	L2
i.	Define path and loop in a graph.	CO-5	L1
j.	Illustrate two real-world applications of graphs with example.	CO-5	L2
SECTION-B			
2.	Construct a stack using a linked list. Push 10, 20, 30, 40 and show the step by step insertion structure with diagram along with the corresponding algorithm.	CO-1	L3
3.	Solve the given array with quick sort and write algorithm to explain all steps. 55, 47, 88, 12, 30, 99, 23, 65, 71	CO-2	L3
4.	Elaborate the concept of BFS traversal of the following graph with 'A' as the source vertex and also write algorithm for it. 	CO-3	L5

5.	Analyze how Insertion Sort works by illustrating each iteration on given elements [8, 3, 5, 4, 7, 6, 2] and explain with algorithm how elements are compared and shifted.	CO-4	L4
6.	Develop an algorithm to insert an element into a queue, in which the queue is implemented as linked list.	CO-5	L6
SECTION-C			
7.	Categorize the various arithmetic expressions using example. Convert the following infix expression into postfix notation using stack and write algorithm to explain all steps. $(A + B) * (C \wedge D - E) \wedge (F + G * H) - I$	CO-1	L4
8.	Compare and contrast stack and queue data structures. Explain their working principles, operations (push, pop, enqueue, dequeue) and applications with neat diagrams.	CO-3	L4
9.	Explain collision resolution in hashing using the separate chaining technique. Using a hash table of size 10 and the hash function $h(k) = k \bmod 10$, insert the keys: 12, 22, 32, 42, 15. Draw the hash table showing how collisions are handled. Discuss the advantages and disadvantages of separate chaining.	CO-4	L5

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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: 06-12-2025

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 hexadecimal equivalent of octal number $(651.124)_8$.	CO-1	L1
b.	Illustrate addition of $(1101)_2$ and $(1010)_2$ using 1's complement method.	CO-1	L2
c.	List any 4 type of min-term implicants and write down examples for each.	CO-2	L1
d.	Show a logic circuit for expression $A'BC + AC$.	CO-2	L2
e.	What is the use of a de-multiplexer as a logic element?	CO-3	L1
f.	Explain the main role and the use of parity checker.	CO-3	L2
g.	Explain in brief about asynchronous counter.	CO-4	L2
h.	Illustrate the difference between volatile and Non-Volatile Memory.	CO-5	L2
i.	Classify various D/A conversion techniques.	CO-6	L2
j.	Define the term quantization error in ADC.	CO-6	L1
SECTION-B			
2.	Solve XS-3 addition of these two decimal numbers 56 and 31.	CO-1	L3
3.	Simplify the following function in SOP form $f(A,B,C,D)=\prod M(0,2,4,6,8,10,12,14) + d(1,11,13,15)$	CO-2	L4
4.	Solve the following function with 8:1 MUX $F(A,B,C,D)=\sum m(1,3,4,11,12,13,14,15)$.	CO-3	L3

5.	Identify the operation of JK flip flop using excitation table.	CO-4	L3
6.	Apply the concept of quantization error in ADCs.	CO-6	L3
SECTION-C			
7.	Simplify $(1000111.10011)_2$ binary number into decimal, then back to binary. Analyze and compare whether the result is identical to the original.	CO-1	L4
8.	Discuss and design the working of mod-6 counter in detail using K map.	CO-4	L6
9.	Elaborate the organization, working principle, and applications of ROM, PROM, EPROM, and EEPROM.	CO-5	L6

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Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

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

DEVELOPMENT OF SOCIETIES

Subject Code: HSMC101-18

M.Code: 76439

Date of Examination: 29-11-2025

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.	"Clan is a group of people having similar thought process". Recall it.	CO-1	L1
b.	Explain how the family system contributed to the development of clans.	CO-1	L2
c.	What do you understand by the industrial social system?	CO-2	L1
d.	Demonstrate briefly how clans gave rise to larger societies.	CO-2	L2
e.	How does a one-party system affect the freedom of citizens?	CO-3	L1
f.	Compare Bureaucracy and Aristocracy with respect to governing system.	CO-3	L2
g.	List any two characteristics of marxism given by Karl Marx.	CO-4	L1
h.	Compare Pre-British and British economic structures in India.	CO-4	L2
i.	List the features of socialist economy.	CO-5	L1
j.	Explain human scale development with example.	CO-5	L2
SECTION-B			
2.	"Individuals are characterized as patterns of society." Discover it.	CO-1	L4
3.	Identify how the biological needs of human beings contributed to the formation of families.	CO-2	L3
4.	Determine the concept of governance in bureaucracy and explain in detail its advantages and disadvantages.	CO-3	L5
5.	Categorize Gandhian decentralization and swaraj with current centralized planning models.	CO-4	L4
6.	Compare buddhist economics and traditional economics with respect to economic development.	CO-5	L5
SECTION-C			
7.	Analyze how kinship and blood relations shaped the transition from families to clans.	CO-1	L4

8.	Analyze the key differences between capitalist, socialist, and mixed models of governance in terms of political and economic control.	CO-3	L4
9.	Interpret the effectiveness of India's post-independence industrial strategies in transforming a colonial economy into a self-reliant and diversified economic system.	CO-4	L5

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Roll No.

Total No. of Pages: 2

Total No. of Questions: 09

B.Tech. (CSE, IT), Semester- 3rd
(AIML, AIDS)
MATHEMATICS - III

Subject Code: BTAM 304-18

M. Code: 76438/76393

Date of Examination: 24-12-2025

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.

Q. No.	Questions	Course Outcomes	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Illustrate $\text{Lt}_{\substack{x \rightarrow 1 \\ y \rightarrow 2}} \frac{2x^2y}{x^2 + y^2 + 1}$	CO1	L2
b.	Find $\frac{dy}{dx}$ if $x^2 + y^2 = c$	CO1	L1
c.	Interpret $\int_1^2 \int_1^3 xy^2 dx dy$	CO2	L2
d.	Translate $\iint_R f(x,y) dx dy$ into polar coordinates.	CO2	L1
e.	State Cauchy Integral test for convergence of a positive term infinite series.	CO3	L1
f.	Test the convergence of the series $\sum \frac{(-1)^{n-1}}{n}$.	CO3	L2
g.	Recall whether the differential equation is exact $(x^2 + y^2 + 2x)dx + 2y dy = 0$.	CO4	L1
h.	Elucidate by reducing into Clairaut's equation: $p = \log(px - y)$.	CO4	L2
i.	Illustrate the differential equation $\frac{d^2y}{dx^2} - 4\frac{dy}{dx} + 3y = 0$.	CO5	L2

j.	Find Particular solution of the differential equation: $\frac{d^2y}{dx^2} - 4y = e^{2x}$.	CO5	L1
SECTION-B			
2.	Using Method of Lagrange Multipliers, Examine the maximum and minimum distance of the point (3, 4, 12) from the sphere $x^2 + y^2 + z^2 = 1$.	CO1	L4
3.	Change the order of integration and hence elaborate $\int_0^{\infty} \int_0^x x e^{-y} dy dx$.	CO2	L6
4.	Examine the convergence of the series $\sum \sqrt{n^4 + 1} - \sqrt{n^4 - 1}$.	CO3	L4
5.	Solve $(3x^2y^3e^y + y^3 + y^2)dx + (x^3y^3e^y - xy)dy = 0$.	CO4	L3
6.	Apply the method of variation of parameter to solve $\frac{d^2y}{dx^2} - 6\frac{dy}{dx} + 9y = \frac{e^{3x}}{x^2}$.	CO5	L3
SECTION-C			
7.	a). Determine the area lying inside the circle $r = a \sin \theta$ and outside the cardioid $r = a(1 - \cos \theta)$ by double integration.	CO2	L5
	b). Prove that the series $x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \dots$ is convergent for $-1 < x \leq 1$. Also write the interval of convergence.	CO3	L5
8.	a). Solve $\frac{dy}{dx} - \frac{dx}{dy} = \frac{x}{y} - \frac{y}{x}$.	CO4	L3
	b). Solve $\frac{dy}{dx} - x \sin 2y = x^3 \cos^2 y$.		
9.	Evaluate: $(x^3 D^3 + 2x^2 D^2 + 2)y = 10 \left(x + \frac{1}{x} \right)$	CO5	L5

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Roll No.

Total No. of Pages: 01

Total No. of Questions: 08

**M.Tech (CSE/ECE), Semester-3rd
OPTIMIZATION TECHNIQUES**

Subject Code: MTCS 304-18

M.Code: 76511

Date of Examination: 18-11-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries TWELVE marks.

Q. No.	Question	Course Outcome	Bloom's Level
1.	Distinguish between design variables and independent variables on the basis of their importance in an optimization problem.	CO1	L4
2.a.	Demonstrate how can a transportation problem be modelled as an optimization problem.	CO2	L2
2.b.	Summarize the term objective function in an optimization problem.	CO2	L2
3.	Analyze the role of decision variables and constraints in solving engineering optimization problems.	CO2	L4
4.	Identify the assumptions made for reducing the complex real-world problems into linear programming problems. Give suitable example.	CO3	L3
5.a.	Explain the salient features of semi-definite programming and the formulation of the primal and dual semi definite programming problems.	CO3	L5
5.b.	Evaluate the importance of mathematical programming in modern engineering design.	CO3	L5
6.	Describe the method of graphical optimization. Solve the following minimization problem by using a graphical method: i. Indicate the feasible region. ii. Is the optimum point constrained?	CO4	L6
7.a.	Identify the different types of mutation with the help of examples.	CO4	L3
7.b.	Simplify the functioning of the Genetic Algorithm with the help of pseudocode.	CO4	L4
8	Evaluate whether linear programming is sufficient for modelling all real-life optimization problems.	CO5	L5

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Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (CSE/AIIML/AIDS/IoT/DS), Semester: 4th
DESIGN AND ANALYSIS OF ALGORITHMS

Subject Code: BTCS403-18

M. Code: 77629

Date of Examination: 17-12-2025

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.

Q. No.	Questions	Course Outcomes	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What do you understand by algorithm evaluation?	CO1	L1
b.	Outline the various steps in the design of an algorithm.	CO1	L2
c.	What is Knapsack problem?	CO2	L1
d.	Demonstrate travelling salesman problem with the help of an example.	CO2	L2
e.	Define Depth First Search algorithm.	CO3	L1
f.	Explain flow network with example.	CO3	L2
g.	What is asymptotic time complexity?	CO4	L1
h.	Explain tractable and non-tractable problems with example.	CO4	L2
i.	What are approximate and optimal solutions?	CO5	L1
j.	Explain heuristics and its characteristics.	CO5	L2
SECTION-B			
2.	Analyze the conditions for using Masters Method for solving recurrences and its limitations.	CO1	L4
3.	Examine the concept of Greedy Method with the help of suitable example.	CO2	L4
4.	Evaluate Bellman Ford shortest path algorithm with the help of an example.	CO3	L5
5.	Compare and Contrast N, NP, NP Hard and NP Complete problems.	CO4	L3

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6.	Explain randomization and approximation algorithms with the help of an example.	CO5	L5
SECTION-C			
7.	Solve the recurrence equation $T(n) = 9T(n/3) + n$ with the help of substitution method.	CO1	L3
8.	Classify the algorithms used to obtain minimum spanning tree. Justify whether these algorithms generate same output or not.	CO3	L4
9.	Interpret the vertex cover problem with the help of an example.	CO4	L5

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Roll No.

Total No. of Pages: 2

Total No. of Questions: 09

B.Tech (CSE/IT/AIIML/AIDS/DS/IOT), Semester- 4th

DISCRETE MATHEMATICS

Subject Code: BTCS-401-18

M.Code: 77626

Date of Examination: 11-12-2025

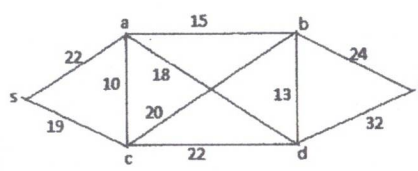
Time: 3 Hrs.

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.

Q. No.	Questions	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define equivalent sets with example.	CO1	L1
b.	Explain the domain and range of the relation $R = \{(x, y) : x \in N, x < 5, y = 3\}$.	CO1	L2
c.	From 5 consonants and 4 vowels, how many words can be constructed using 3 consonants and 2 vowels?	CO2	L1
d.	Explain pigeonhole principle.	CO2	L2
e.	Show that $(p \wedge q) \rightarrow p$ is a tautology.	CO3	L1
f.	Explain the Converse and Contrapositive of the implication "if it snows tonight, then I will stay at home".	CO3	L2
g.	Define an abelian group.	CO4	L1
h.	Explain commutative ring with unity with example.	CO4	L2
i.	Does there exists a simple graph with six vertices of degrees 1, 1, 3, 4, 6, 7? Explain.	CO5	L2
j.	What will be the chromatic number of complete graph with n - vertices?	CO5	L1

SECTION-B			
2.	Examine whether intersection of two partial order relations is a partial order relation. But union of two partial order relations need not be a partial order relation. Give suitable example.	CO1	L4
3.	a) Examine how many people must you have to guarantee that at least 12 of them will have birthday on the same day of the week? b) Find the number of positive integers from 1 to 1000 which are divisible by none of 5, 6 and 8.	CO2	L4
4.	a) Construct the truth table for $(p \wedge q) \vee r = (p \vee r) \wedge (q \vee r)$ b) Test the validity of the following argument: If a man is bachelor, he is unhappy. If a man is unhappy, he dies young. Therefore bachelors die young.	CO3	L3
5.	Solve the set C^* of all non-zero complex numbers form an infinite abelian group under the operation of multiplication of complex numbers.	CO4	L3
6.	a) Prove that sum of degree of all vertices in a graph is equal to twice the number of edges in G b) Prove that in a graph the number of vertices of odd degree is even.	CO5	L5
SECTION-C			
7.	Let $f : R \rightarrow R$ and $g : R \rightarrow R$ be a real valued functions defined by $f(x) = 2x^3 - 1, x \in R$ and $g(x) = \left(\frac{x+1}{2}\right)^{1/3}, x \in R$. Examine whether f and g is inverse of each other?	CO1	L4
8.	Prove that a finite integral domain is a field.	CO4	L5
9.	Estimate shortest path from s to f for the following graph: 	CO5	L6

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Roll No.

Total No. of Pages:04

Total No. of Questions: 11

B. Tech (CSE/ECE/AIIML/AIDS/DS/IOT), Semester 4th
UNIVERSAL HUMAN VALUES/ UNIVERSAL HUMAN VALUES-II

Subject Code: HSMC-122-18

M. Code: 77630/91979

Date of Examination: 19-11-25

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
- SECTION-B contains FIVE questions carrying FOUR marks each and students have to attempt all the questions.
- SECTION C contains FIVE questions carrying SIX marks each and students have to attempt all the questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	How can you maintain harmony in relationship? आप रिश्ते में सामंजस्य कैसे बनाए रख सकते हैं? तुम्हीं रिश्ते में सद्भावना कैसे बनाए रख सकते हो?	CO1	L1
b.	Outline the basic guidelines for value education. मूल्य शिक्षा के लिए बुनियादी दिशा-निर्देशों की रूपरेखा तैयार करें। मूल्य शिक्षा लक्ष्य-बुनियादी दिशा-निर्देशों की रूपरेखा तैयार करें।	CO1	L2
c.	List the problems that we are facing today because of operating on the basis of pre-conditioned desires and sensation. पूर्व-निर्धारित इच्छाओं और संवेदना के आधार पर काम करने के कारण आज हम जिन समस्याओं का सामना कर रहे हैं, उन्हें सूचीबद्ध करें। उन्हें समझाने की सही विधि-विधानों का अर्थ समझाएं। उन्हें समझाने की सही विधि-विधानों का अर्थ समझाएं। उन्हें समझाने की सही विधि-विधानों का अर्थ समझाएं।	CO2	L1
d.	Interpret, how do we go into conflicts when our activities are not guided by our natural acceptance. व्याख्या करें, हम संघर्षों में कैसे जाते हैं जब हमारी गतिविधियाँ हमारी स्वाभाविक स्वीकृति से निर्देशित नहीं होती हैं। व्याख्या करें, हम संघर्षों में कैसे जाते हैं जब हमारी गतिविधियाँ हमारी स्वाभाविक स्वीकृति से निर्देशित नहीं होती हैं। व्याख्या करें, हम संघर्षों में कैसे जाते हैं जब हमारी गतिविधियाँ हमारी स्वाभाविक स्वीकृति से निर्देशित नहीं होती हैं।	CO2	L2

c.	What is prosperity? Is it different from happiness? समृद्धि क्या है? क्या यह खुशी से अलग है? खुशहाली की है? की इच्छा-सुखी से अलग है?	CO3	L1
f.	Infer natural acceptance of human values. मानवीय मूल्यों की स्वाभाविक स्वीकृति। मानवीय मूल्यों की स्वाभाविक स्वीकृति। मानवीय मूल्यों की स्वाभाविक स्वीकृति।	CO3	L2
g.	Summarize what humanistic education is all about. संक्षेप में बताइए कि मानवतावादी शिक्षा क्या है। संक्षेप में बताइए कि मानवतावादी शिक्षा क्या है। संक्षेप में बताइए कि मानवतावादी शिक्षा क्या है।	CO4	L2
h.	Explain natural acceptance of human values. मानवीय मूल्यों की स्वाभाविक स्वीकृति की व्याख्या कीजिए। मानवीय मूल्यों की स्वाभाविक स्वीकृति की व्याख्या कीजिए। मानवीय मूल्यों की स्वाभाविक स्वीकृति की व्याख्या कीजिए।	CO4	L2
i.	Illustrate the term self-regulation in nature. प्रकृति में स्व-नियमन शब्द का चित्रण करें। प्रकृति में स्व-नियमन शब्द का चित्रण करें। प्रकृति में स्व-नियमन शब्द का चित्रण करें।	CO5	L2
j.	Define Ethical Human Conduct. नैतिक मानव आचरण को परिभाषित कीजिए। नैतिक मानव आचरण को परिभाषित कीजिए। नैतिक मानव आचरण को परिभाषित कीजिए।	CO5	L1
SECTION-B			
2.	Utilize harmony in nature and identify the meaning of co-existence with nature. प्रकृति में सामंजस्य का उपयोग करें और प्रकृति के साथ सह-अस्तित्व के अर्थ की पहचान करें। प्रकृति में सामंजस्य का उपयोग करें और प्रकृति के साथ सह-अस्तित्व के अर्थ की पहचान करें। प्रकृति में सामंजस्य का उपयोग करें और प्रकृति के साथ सह-अस्तित्व के अर्थ की पहचान करें।	CO1	L3
3.	"Skills and Human Values are Complementary". Analyze this statement with example. "कौशल और मानवीय मूल्य पूरक हैं।" उदाहरण के साथ इस कथन का विश्लेषण करें। "कौशल और मानवीय मूल्य पूरक हैं।" उदाहरण के साथ इस कथन का विश्लेषण करें। "कौशल और मानवीय मूल्य पूरक हैं।" उदाहरण के साथ इस कथन का विश्लेषण करें।	CO2	L4
4.	Elaborate the five dimensions of human endeavor and how they are helpful in achieving comprehensive human goals. Also explain the state of society today in terms of fulfilment of comprehensive human goal. मानव प्रयास के पाँच आयामों का विस्तार से वर्णन करें कि वे व्यापक मानव लक्ष्यों को प्राप्त करने में कैसे सहायक हैं। व्यापक मानव लक्ष्य की पूर्ति के संदर्भ में आज समाज की स्थिति की भी व्याख्या करें। मानव प्रयास के पाँच आयामों का विस्तार से वर्णन करें कि वे व्यापक मानव लक्ष्यों को प्राप्त करने में कैसे सहायक हैं। व्यापक मानव लक्ष्य की पूर्ति के संदर्भ में आज समाज की स्थिति की भी व्याख्या करें। मानव प्रयास के पाँच आयामों का विस्तार से वर्णन करें कि वे व्यापक मानव लक्ष्यों को प्राप्त करने में कैसे सहायक हैं। व्यापक मानव लक्ष्य की पूर्ति के संदर्भ में आज समाज की स्थिति की भी व्याख्या करें।	CO3	L5

	ਵਿਆਪਕ ਮਨੁੱਖੀ ਟੀਚੇ ਦੀ ਪੂਰਤੀ ਦੇ ਸੰਦਰਭ ਵਿੱਚ ਅੱਜ ਸਮਾਜ ਦੀ ਸਥਿਤੀ ਦੀ ਵੀ ਵਿਆਖਿਆ ਕਰੋ।		
5.	List the four orders of nature. Also, analyze the interconnectedness and mutual fulfilment in four orders of nature with examples. ਪ੍ਰਕ੍ਰਿਤੀ ਦੇ ਚਾਰ ਕ੍ਰਮਾਂ ਦੀ ਸੂਚੀ ਬਨਾਓ। ਇਸਦੇ ਅਲਾਗ, ਉਦਾਹਰਣਾਂ ਦੇ ਸਾਥ ਪ੍ਰਕ੍ਰਿਤੀ ਦੇ ਚਾਰ ਕ੍ਰਮਾਂ ਵਿੱਚ ਪਰਸਪਰ ਜੁੜਾਵ ਅਤੇ ਆਪਸੀ ਪੂਰਤੀ ਦਾ ਵਿਸ਼ਲੇਸ਼ਣ ਕਰੋ। ਕੁਦਰਤ ਦੇ ਚਾਰ ਆਦੇਸ਼ਾਂ ਦੀ ਸੂਚੀ ਬਣਾਓ। ਨਾਲ ਹੀ, ਉਦਾਹਰਣਾਂ ਦੇ ਨਾਲ ਕੁਦਰਤ ਦੇ ਚਾਰ ਕ੍ਰਮ ਵਿੱਚ ਪਰਸਪਰ ਸੰਬੰਧਾਂ ਅਤੇ ਆਪਸੀ ਪੂਰਤੀ ਦਾ ਵਿਸ਼ਲੇਸ਼ਣ ਕਰੋ।	CO4	L4
6.	Apply ethical principles to identify current issues in professional ethics and list five unethical practices along with the methods used to curb them. ਪੇਸ਼ੇਵਰ ਨੈਤਿਕਤਾ ਵਿੱਚ ਮੌਜੂਦਾ ਮੁੱਦਿਆਂ ਦੀ ਪਛਾਣ ਕਰਨ ਦੇ ਲਿਏ ਨੈਤਿਕ ਸਿਫ਼ਤਾਂ ਦੀ ਲਾਗੂ ਕਰੋ ਅਤੇ ਉਨ੍ਹਾਂ ਦੇ ਅਨੁਕੂਲ ਲਗਾਨੇ ਦੇ ਲਿਏ ਉਪਯੋਗ ਕੀਤੇ ਗਏ ਤਰੀਕਿਆਂ ਦੇ ਸਾਥ ਪੰਜ ਅਨੈਤਿਕ ਪ੍ਰਥਾਵਾਂ ਦੀ ਸੂਚੀਬੱਧ ਕਰੋ। ਪੇਸ਼ੇਵਰ ਨੈਤਿਕਤਾ ਵਿੱਚ ਮੌਜੂਦਾ ਮੁੱਦਿਆਂ ਦੀ ਪਛਾਣ ਕਰਨ ਲਈ ਨੈਤਿਕ ਸਿਫ਼ਤਾਂ ਨੂੰ ਲਾਗੂ ਕਰੋ ਅਤੇ ਉਨ੍ਹਾਂ ਨੂੰ ਰੋਕਣ ਲਈ ਵਰਤੇ ਜਾਣ ਵਾਲੇ ਤਰੀਕਿਆਂ ਦੇ ਨਾਲ ਪੰਜ ਅਨੈਤਿਕ ਅਭਿਆਸਾਂ ਦੀ ਸੂਚੀ ਬਣਾਓ।	CO5	L3
SECTION-C			
7.	Explain in detail various basic requirements to fulfil human aspiration. ਮਾਨਵ ਆਕਾਂਸ਼ਿਆਂ ਦੀ ਪੂਰਤੀ ਕਰਨ ਦੇ ਲਿਏ ਵਿਸ਼ਿਸ਼ਟ ਬੁਨਿਆਦੀ ਆਵਸ਼ਯਕਤਾਵਾਂ ਦੀ ਵਿਸਤਾਰ ਸੇ ਸਮਝਾਓ। ਮਨੁੱਖੀ ਇੱਛਾਵਾਂ ਨੂੰ ਪੂਰਾ ਕਰਨ ਲਈ ਵੱਖ-ਵੱਖ ਬੁਨਿਆਦੀ ਜ਼ਰੂਰਤਾਂ ਬਾਰੇ ਵਿਸਥਾਰ ਵਿੱਚ ਦੱਸੋ।	CO2	L5
8.	Identify the differences between human and animal consciousness, and how 'shiksha' and 'sanskar' help transform a person toward human consciousness. ਮਾਨਵ ਅਤੇ ਪਸ਼ੂ ਚੇਤਨਾ ਦੇ ਭੇਦਾਂ ਦੀ ਪਛਾਣ ਕਰੋ, ਅਤੇ ਕਿਵੇਂ 'ਸਿੱਖਿਆ' ਅਤੇ 'ਸੰਸਕਾਰ' ਇੱਕ ਵਿਅਕਤੀ ਨੂੰ ਮਨੁੱਖੀ ਚੇਤਨਾ ਵੱਲ ਬਦਲਣ ਵਿੱਚ ਮਦਦ ਕਰਦੇ ਹਨ।	CO3	L3
9.	Determine the concept of an undivided society and the universal order and explain how both these can help to create a world family. ਅਭਿਯੋਗਿਤ ਸਮਾਜ ਅਤੇ ਸਾਰ्वੱਮਿਕ ਵਿਵਸਥਾ ਦੀ ਅਵਗਠਨਾ ਦਾ ਨਿਰਧਾਰਨ ਕਰੋ ਅਤੇ ਸਮਝਾਓ ਕਿ ਇਹ ਦੋਨਾਂ ਨੂੰ ਇੱਕ ਵਿਸ਼ਵ ਪਰਿਵਾਰ ਬਣਾਉਣ ਵਿੱਚ ਮਦਦ ਕਰ ਸਕਦੇ ਹਨ।	CO4	L5

	ਇੱਕ ਅਟੁੱਟ ਸਮਾਜ ਅਤੇ ਸਰਬਵਿਆਪੀ ਵਿਵਸਥਾ ਦੀ ਧਾਰਨਾ ਨੂੰ ਨਿਰਧਾਰਤ ਕਰੋ ਅਤੇ ਸਮਝਾਓ ਕਿ ਇਹ ਦੋਨਾਂ ਇੱਕ ਵਿਸ਼ਵ ਪਰਿਵਾਰ ਬਣਾਉਣ ਵਿੱਚ ਕਿਵੇਂ ਮਦਦ ਕਰ ਸਕਦੇ ਹਨ।		
10.	Analyze the universal human order and examine your role in progressing toward it. ਸਾਰਵੱਮਿਕ ਮਾਨਵ ਵਿਵਸਥਾ ਦਾ ਵਿਸ਼ਲੇਸ਼ਣ ਕਰੋ ਅਤੇ ਇਸ ਵਿੱਚ ਆਪਣੇ ਭੂਮਿਕਾ ਦੀ ਜਾਂਚ ਕਰੋ। ਸਰਬਵਿਆਪੀ ਮਨੁੱਖੀ ਵਿਵਸਥਾ ਦਾ ਵਿਸ਼ਲੇਸ਼ਣ ਕਰੋ ਅਤੇ ਇਸ ਵਿੱਚ ਆਪਣੀ ਭੂਮਿਕਾ ਦੀ ਜਾਂਚ ਕਰੋ।	CO5	L4
11.	Explain self-organization and health. Evaluate their role in achieving the harmony in nature. स्व-संगठन और स्वास्थ्य की व्याख्या कीजिए। प्रकृति में सामंजस्य प्राप्त करने में उनकी भूमिका का मूल्यांकन करें। स्ਵ-ਸੰਗਠਨ ਅਤੇ ਸਿਹਤ ਦੀ ਵਿਆਖਿਆ ਕਰੋ। ਕੁਦਰਤ ਵਿੱਚ ਸਦਭਾਵਨਾ ਪ੍ਰਾਪਤ ਕਰਨ ਵਿੱਚ ਉਹਨਾਂ ਦੀ ਭੂਮਿਕਾ ਦਾ ਮੁਲਾਂਕਣ ਕਰੋ।	CO1	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.

Total No. of Questions: 11

B. Tech (CSE/ECE/AI/ML/AIDS/DS/IOT), Semester 4th
UNIVERSAL HUMAN VALUES/ UNIVERSAL HUMAN VALUES-II

Subject Code: HSMC-122-18

M. Code: 77630/91979

Date of Examination: 19-11-25

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
- SECTION-B contains FIVE questions carrying FOUR marks each and students have to attempt all the questions.
- SECTION C contains FIVE questions carrying SIX marks each and students have to attempt all the questions.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly: a. How can you maintain harmony in relationship? आप रिश्ते में सामंजस्य कैसे बनाए रख सकते हैं?	CO1	L1
	b. उन्हीं विमर्शों में सट्टा-दण्ड विवेकशीलता रख सकते हैं?	CO1	L2
	c. Outline the basic guidelines for value education. मूल्य शिक्षा के लिए बुनियादी दिशा-निर्देशों को स्पष्टता प्रदान करें। यूँ ही शिक्षण रखें और सट्टा-दण्ड विवेकशीलता रखें।	CO2	L1
	d. List the problems that we are facing today because of operating on the basis of pre-conditioned desires and sensation. हम जिन समस्याओं का सामना कर रहे हैं, उन्हें सूचीबद्ध करें। हमारे सामने आज के समय में पूर्व-निर्धारित इच्छाओं और संवेदन के आधार पर काम करने के कारण आज के दिनों में सामंजस्य की कमी क्यों है? और इसे सुधारा कैसे देंगे। कौन से कारण हैं कि हमें आज के दिनों में सामंजस्य की कमी का सामना करना पड़ रहा है? और इसे सुधारा कैसे देंगे।	CO2	L2

e.	What is prosperity? Is it different from happiness? समृद्धि क्या है? क्या यह खुशी से अलग है? धनलक्ष्मी की शक्ति? की शक्ति धन से अलग है?	CO3	L1
f.	Infer natural acceptance of human values. मानवीय मूल्यों की स्वाभाविक स्वीकृति। मनुष्य की स्वभाविक स्वीकृति।	CO3	L2
g.	Summarize what humanistic education is all about. संक्षेप में बताइए कि मानवतावादी शिक्षा क्या है। मनुष्य की शिक्षा के बारे में संक्षेप में लिखें।	CO4	L2
h.	Explain natural acceptance of human values. मानवीय मूल्यों की स्वाभाविक स्वीकृति की व्याख्या कीजिए। मनुष्य की स्वभाविक स्वीकृति।	CO4	L2
i.	Illustrate the term self-regulation in nature. प्रकृति में स्व-नियंत्रण शब्द का चित्रण करें। वृद्धि के लिए स्व-नियंत्रण शब्द की व्याख्या करें।	CO5	L2
j.	Define Ethical Human Conduct. नैतिक मानव आचरण को परिभाषित कीजिए। नैतिक मनुष्यी आचरण को परिभाषित करें।	CO5	L1

SECTION-B			
2.	Utilize harmony in nature and identify the meaning of co-existence with nature. प्रकृति में सामंजस्य का उपयोग करें और प्रकृति के साथ सह-अस्तित्व के अर्थ की पहचान करें। वृद्धि के लिए सट्टा-दण्ड की शक्ति को पहचानें। अर्थ की पहचान करें।	CO1	L3
3.	"Skills and Human Values are Complementary". Analyze this statement with example. "कौशल और मानवीय मूल्य पूरक हैं।" उदाहरण के साथ इस कथन का विश्लेषण करें। "गुण और मनुष्य की शक्ति-बोधपूर्ण प्रयत्न"। उदाहरण के साथ इस कथन का विश्लेषण करें।	CO2	L4
4.	Elaborate the five dimensions of human endeavor and how they are helpful in achieving comprehensive human goals. Also explain the state of society today in terms of fulfillment of comprehensive human goal. मानव प्रयास के पाँच आयामों का विस्तार से वर्णन करें कि वे व्यापक मानव लक्ष्यों को प्राप्त करने में कैसे सहायक हैं। व्यापक मानव लक्ष्य की पूर्ति के संदर्भ में आज समाज की स्थिति की भी व्याख्या करें। मनुष्य की शक्ति के पाँच आयामों का विस्तार से वर्णन करें कि वे व्यापक मानव लक्ष्यों को प्राप्त करने में कैसे सहायक हैं।	CO3	L5

	द्विआयुष्य मनुष्यी त्रीते दी पुत्रती दे संतवड द्विच भंन ममान दी मध्वी दी दी द्विआयुष्य वते।		
5.	List the four orders of nature. Also, analyze the interconnectedness and mutual fulfillment in four orders of nature with examples. प्रकृति के चार क्रमों की सूची बनाएँ। इसके अलावा, उदाहरणों के साथ प्रकृति के चार क्रमों में परस्पर जुड़ाव और आपसी पूर्ति का विश्लेषण करें। वृत्तवट दे चार आयुष्य दी सुची घटाएँ। नाल ती, उतावटवट दे नाल वृत्तवट दे चार वृष्य द्विच पवमपव मंषंषं भडे आयुष्यी पुत्रती टा द्विसलेसट वते।	CO4	L4
6.	Apply ethical principles to identify current issues in professional ethics and list five unethical practices along with the methods used to curb them. देशवर नैतिकता में वर्तमान मुद्दों की पहचान करने के लिए नैतिक सिद्धांतों को लागू करें और उन पर अंकुश लगाने के लिए उपयोग किए जाने वाले तरीकों के साथ पांच अनैतिक प्रथाओं को सूचीबद्ध करें। पुसवट नैतिकता द्विच भैनुटा पुंदिषां दी पढाट वरन लयी नैतिक मियंटां नुं छावु वते भडे उतां नुं वेवट लयी वरते नाल उतीविआं दे नाल पंन भनैतिक भविआं दी सुची घटाएँ।	CO5	L3
SECTION-C			
7.	Explain in detail various basic requirements to fulfil human aspiration. मानव आकांक्षाओं को पूरा करने के लिए विभिन्न बुनियादी आवश्यकताओं को विस्तार से समझाइए। मनुष्यी द्विहटां नुं पुत्रा वरन लयी देव देव घुनिभटी नवुवटां घावे द्विसवट द्विच टंषी।	CO2	L5
8.	Identify the differences between human and animal consciousness, and how 'shiksha' and 'sanskar' help transform a person toward human consciousness. मानव और पशु चेतना के बीच अंतर की पहचान करें, और कैसे 'शिक्षा' और 'संस्कार' एक व्यक्ति को मानव चेतना की ओर बदलने में मदद करते हैं। मनुष्यी भडे पशु चेतना टरभिआन भंउटां दी पढाट वते, भडे विदे 'शिक्षा' भडे 'संस्कार' द्विच द्विभवती नुं मनुष्यी चेतना देल घटावट द्विच भट्ट वरते वन।	CO3	L3
9.	Determine the concept of an undivided society and the universal order and explain how both these can help to create a world family. एक अविभाजित समाज और सार्वभौमिक व्यवस्था की अवधारणा का निर्धारण करें और समझाएं कि ये दोनों कैसे एक विश्व परिवार बनाने में मदद कर सकते हैं।	CO4	L5

	द्विच भट्ट ममान भडे मववद्विआयुष्यी द्विचमषा दी पावना नुं निवपावट वते भडे मभट्टादि वि द्विच देहे द्विच द्विसट पविटार घटाछिद द्विच विदे भट्ट वर मवटे वन।		
10.	Analyze the universal human order and examine your role in progressing toward it. सार्वभौमिक मानव व्यवस्था का विश्लेषण करें और इस दिशा में आपो बढ़ने में अपनी भूमिका की जांच करें। मववद्विआयुष्यी मनुष्यी द्विचमषा टा द्विसलेसट वते भडे द्विस देल टपट द्विच आयुष्यी बुनिवा दी नच वते।	CO5	L4
11.	Explain self-organization and health. Evaluate their role in achieving the harmony in nature. स्व-संगठन और स्वास्थ्य की व्याख्या कीजिए। प्रकृति में सामंजस्य प्राप्त करने में उनकी भूमिका का मूल्यांकन करें। मदे-संगठन भडे मिवट दी द्विआयुष्य वते। वृत्तवट द्विच मट्टावटन पुपट वरन द्विच उतां दी बुनिवा टा भुलवट वते।	CO1	L5

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Total No. of Pages: 02

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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: 04 -12-2025

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.	Outline the practical applications of Python in Data Science and Machine Learning.	CO-1	L2
b.	Compare mutable and immutable data types with examples.	CO-1	L2
c.	Show the use of the input() function in Python.	CO-2	L1
d.	Demonstrate the syntax of a nested for loop in Python.	CO-2	L2
e.	Show Python code for extracting all digits from a given a string "Python123is45fun".	CO-3	L1
f.	Explain the term lambda function with a basic example.	CO-3	L2
g.	Define exception handling.	CO-4	L1
h.	Compare text mode and binary mode in file handling.	CO-4	L2
i.	Explain the role of self in designing Python classes.	CO-5	L2
j.	Show Python code to display the current system date and time.	CO-5	L2
SECTION-B			
2.	Develop a Python program that determines whether an integer is even, odd, zero or negative using operators and conditional statements.	CO-1	L3
3.	Analyse <i>if</i> , <i>if-else</i> , and <i>if-elif-else</i> statements in Python by supporting your explanation with code illustrations.	CO-2	L4
4.	Build a Python program to implement a simple calculator using functions for addition, subtraction, multiplication, and division. Identify how function decomposition helps in code modularity.	CO-3	L3

5.	Explain the concept of Object-Oriented Programming (OOP) by writing code in Python with focus on classes and objects. Determine how attributes and methods are defined, accessed and modified.	CO-4	L5
6.	Explain the concept of data compression in Python. Examine the commonly used modules for compression and decompression of files.	CO-5	L5
SECTION-C			
7.	Analyse Python operators and expressions by building code for computing the total bill amount for the given scenario: An electricity board charges: ₹5 per unit for the first 100 units, ₹8 per unit for the next 100 units and ₹10 per unit for units above 200. Print the total bill amount for a household consuming 275 units.	CO-1	L4
8.	Identify the difference between pass by value and pass by reference in Python by writing a program that modifies a List and Tuple inside a function.	CO-3	L3
9.	Compare the difference between built-in exceptions and user-defined exceptions in Python. Write examples for both and explain situations where user-defined exceptions are preferable.	CO-4	L5

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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: 01-12-2025

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 the main phases of the Software Development Life Cycle.	CO-1	L1
b.	Compare throwaway prototyping and evolutionary prototyping with suitable examples.	CO-1	L2
c.	Define the term Coupling in context of Software Design.	CO-2	L1
d.	Compare function oriented design and object oriented design.	CO-2	L2
e.	List any two advantages of white-box testing.	CO-3	L1
f.	Contrast mutation testing with regression testing in terms of objectives.	CO-3	L2
g.	State one benefit of effective project scheduling in software development.	CO-4	L1
h.	Outline the steps involved in creating a Work Breakdown Structure (WBS) for a software project.	CO-4	L2
i.	Recall the role of CASE tools in software development.	CO-5	L1
j.	Illustrate the meaning of component-based development in software engineering.	CO-5	L2
SECTION-B			
2.	Compare Spiral model and Evolutionary models with respect to risk handling.	CO-1	L4
3.	Construct UML use case diagram to illustrate the interactions among a customer, admin, and online shopping system for placing and managing orders.	CO-2	L3
4.	Evaluate the role of reliability growth models in software testing.	CO-3	L5

5.	Examine importance of quality management in project success.	CO-4	L4
6.	Evaluate the effectiveness of the four main types of software maintenance (corrective, adaptive, perfective, and preventive) in managing the lifecycle of a large-scale enterprise software system, such as an ERP application.	CO-5	L5
SECTION-C			
7.	Analyze the structure of SRS document. Also examine the SRS document for an ERP system for Student Attendance Management System.	CO-1	L4
8.	Analyze equivalence partitioning and boundary value analysis for a banking transaction system by giving suitable examples.	CO-3	L4
9.	Recommend project scheduling activities for a railway ticket booking system and also explain the importance of Gantt chart and PERT chart.	CO-4	L5

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6.	Explain the importance DB-API and Object Relational Managers (ORMs). Write an example using SQL Alchemy to define a model, insert records, and query them.	CO-5	L5
SECTION-C			
7.	Analyze the use of built-in modules versus user-defined modules in terms of reusability, performance, and scalability.	CO-2	L4
8.	Identify the difference between various types of GUI's.	CO-3	L3
9.	Elaborate the role of web servers (HTTP Servers) in managing client-server communication efficiency in Python web programming.	CO-4	L6

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5.	Determine the responsibilities of the transport layer in the OSI model and explain how it ensures reliable process-to-process communication?	CO-4	L5
6.	A sender wants to transmit the dataword 101110 using the generator polynomial $G(x) = x^3 + x + 1$ (binary 1011). Apply binary division to compute the CRC remainder. Write the final transmitted codeword. Verify at the receiver side whether the received codeword 101110111 contains any error.	CO-2	L3
SECTION-C			
7.	Identify the concept of Pure ALOHA and Slotted ALOHA protocols for channel access in networks. Compare their efficiency, throughput, and collision handling, and justify which protocol performs better under heavy network traffic with an example?	CO-2	L3
8.	Examine 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	L4
9.	Assess the effectiveness of UDP in process-to-process communication. Judge its advantages and limitations compared to TCP, and justify why it is preferred for certain applications like VoIP or video streaming?	CO-5	L5

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Total No. of Pages: 02

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B.Tech (CSE), Semester 5th
ENTERPRISE RESOURCE PLANNING

Subject Code: - BTES 501-18

M.Code: - 78319

Date of Examination: 22-11-2025

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 Process Reengineering (BPR).	CO-1	L1
b.	Explain any two technologies related to ERP.	CO-1	L2
c.	What is the role of gap analysis in ERP implementation?	CO-2	L1
d.	Outline the main strategies to consider before starting ERP implementation.	CO-2	L2
e.	What is the role of Business planning and budgeting in ERP Finance?	CO-3	L1
f.	Explain the Market Risk Management module in an ERP.	CO-3	L2
g.	What is the use of the Procurement or Purchase module in ERP?	CO-4	L1
h.	Explain one benefit of hiring external consultants?	CO-4	L2
i.	List any two features of Turbo Charged ERP systems.	CO-5	L1
j.	Compare ERP and e-Commerce.	CO-5	L2
SECTION-B			
2.	Analyze how ERP implementation benefits different functional areas within an organization.	CO-1	L4
3.	Identify five major features of PeopleSoft and explain them.	CO-2	L3
4.	Explain how Internet technologies support ERP networking.	CO-3	L2
5.	Discover how PeopleSoft, Oracle, and SAP contribute differently to data integration and business performance improvement.	CO-4	L4

6.	Distinguish between ERP's present challenges and future opportunities.	CO-5	L4
SECTION-C			
7.	Discover the role of Business Process Reengineering(BPR), along with the benefits and challenges of using BPR in company.	CO-1	L4
8.	Categorize the functional modules of an ERP system based on their roles in different business departments.	CO-3	L4
9.	Explain strategies to improve customer relationship management using ERP systems.	CO-4	L5

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

FORMAL LANGUAGES AND AUTOMATA THEORY

Subject Code: BTCS502-18

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

Date of Examination: 17-11-2025

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 about the acceptability of a string using DFA.	CO-1	L1
b.	Classify four tuples of a grammar G with the help of an example.	CO-1	L2
c.	Recall the difference between DFA and NFA. Give an example.	CO-2	L1
d.	Outline the steps for minimizing a finite automaton and summarize why minimization is required.	CO-2	L2
e.	When is a CFG said to be in GNF?	CO-3	L1
f.	Consider the grammar $S \rightarrow aAS \mid a$ $A \rightarrow SbA \mid SS \mid ba$ Show how the string aabb _a is generated and illustrate its derivation tree.	CO-3	L2
g.	Explain the importance of LBAs in formal language theory.	CO-4	L2
h.	Outline the closure properties of Turing-recognizable languages.	CO-5	L2
i.	Compare SAT and 3-SAT and prove that 3-SAT is NP-complete.	CO-6	L2
j.	State Rice's Theorem.	CO-6	L1
SECTION-B			
2.	Identify the language $L = \{a^n b^m c^m d^m \mid n \geq 1, m \geq 1\}$ and categorize its structure by analyzing an appropriate grammar representation.	CO-1	L3
3.	Explain about Arden's theorem, for constructing the RE from given FA.	CO-2	L4
4.	Consider grammar with productions $E \rightarrow I$ $E \rightarrow E + E$ $E \rightarrow E * E$ $E \rightarrow (E)$ $I \rightarrow \varepsilon \mid 0 \mid 1 \mid \dots \mid 9$ Determine whether the above grammar is ambiguous for the given string $\omega = 3*2+5$	CO-3	L5

5.	Construct a LBA which can accept $L = \{ww^R \mid w \text{ belongs to } \{0,1\}^*\}$	CO-4	L6
6.	Appraise the importance of polynomial reductions in classifying problems.	CO-6	L3
SECTION-C			
7.	Identify the automata machines that accept different languages according to the Chomsky hierarchy.	CO-1	L3
8.	What is PDA? Identify how does a PDA handle the recognition of context free languages and what role does its stack play in this process.	CO-4	L3
9.	Evaluate a Turing Machine that recognizes all strings having equal numbers of 0's and 1's and conclude its correctness.	CO-5	L5

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B. Tech. (CSE), Semester 6th

COMPILER DESIGN

Subject Code: BTCS-601-18

M. Code: 79249

Date of Examination: 08-12-2025

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.	Questions	Course Outcomes	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Infer the difference in these two regular expression a^+ and a^* .	CO1	L2
b.	Define left recursion with example.	CO2	L1
c.	What information is stored in activation record?	CO4	L1
d.	Compare Token, Lexeme and Pattern using suitable examples.	CO1	L2
e.	Interpret the terms Handle and Handle Pruning.	CO2	L2
f.	What is machine dependent code optimization?	CO5	L1
g.	What is the purpose of look ahead pointer in input buffering?	CO1	L1
h.	Compare synthesized and inherited attribute.	CO3	L2
i.	Define dead-code elimination with example.	CO5	L1
j.	Compare NDFA and DFA.	CO1	L2

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SECTION-B			
2.	Design a predictive parsing table for given grammar $E \rightarrow E+T \mid T, \quad T \rightarrow T*F \mid F, \quad F \rightarrow id$	CO2	L6
3.	Analyze in detail three address codes along with their implementation.	CO3	L4
4.	Examine various Error handling and recovery techniques.	CO1	L4
5.	Identify various storage allocation strategies with suitable examples.	CO4	L3
6.	Construct the Directed Acyclic Graph (DAG) for following statement: $a+b*c+d+b*c$	CO3	L3
SECTION-C			
7.	Analyze diagrammatically the structure of a compiler and inspect its various phases in detail.	CO1	L4
8.	Interpret the importance of code optimization in compiler design. Also explain peephole optimization in detail along with suitable example.	CO5	L5
9.	Construct a syntax directed definition for constructing a syntax tree for assignment statements $S \rightarrow id: = E, E \rightarrow E1 + E2, E \rightarrow E1 * E2, E \rightarrow - E1, E \rightarrow (E1), E \rightarrow id$	CO3	L6

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Total No. of Questions: 09

B.Tech. (CSE), Semester 6th
ARTIFICIAL INTELLIGENCE
 Subject Code: BTCS-602-18
 M. Code: 79250
 Date of Examination: 15-12-2025

Max. Marks: 60

Time: 3 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.	Questions	Course Outcomes	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What are the characteristics of AI?	CO1	L1
b.	Interpret the composition of AI.	CO1	L2
c.	What do you mean by speech and voice recognition?	CO2	L1
d.	List out the steps of problem formulation in AI.	CO2	L2
e.	Summarize the two player game with search tree.	CO3	L2
f.	Outline the term probabilistic reasoning and explain its need in AI.	CO3	L2
g.	What is the role of conditional probability in deducing Bayes theorem?	CO3	L1
h.	Define the term uncertainty with the help of an example.	CO4	L1
i.	What do understand by adaptive dynamic programming?	CO5	L1
j.	How learning agents learn from the environment, explain with suitable example.	CO6	L1

SECTION-B			
2.	Explain how one can identify working environment of an agent by quoting a suitable example. Also explain Agent AI?	CO1	L3
3.	Examine the concept of Minimax Gammig algorithm with the help of example.	CO2	L4
4.	Evaluate the significance of state space representation in solving a complex problem.	CO3	L5
5.	Explain in detail the types of reinforcement learning by considering approach of decision tree.	CO4	L5
6.	Identify the concept of direct utility estimation in problem solving with a suitable example.	CO5	L3
SECTION-C			
7.	Discover a Bayesian network for any one of the AI problems of your choice and identify the method to generate inference from it.	CO1	L4
8.	Construct an appropriate geometry of hidden Markov model and explain its applications in speech recognition and NLP.	CO4	L3
9.	Explain informed and unformed search strategies with an appropriate algorithm. Also interpret their characteristics and applications.	CO5	L5

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Total No. of Pages: 2

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B. Tech (Computer Science Engineering), Semester: 6th

MACHINE LEARNING

Subject Code: BTCS-618-18

M. Code: 79257

Date of Examination: 22-11-2025

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.	Questions	Course Outcomes	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	How unsupervised learning is different from supervised learning?	CO1	L1
b.	What is data reduction in data preprocessing?	CO2	L1
c.	Demonstrate the significance of training a testing dataset.	CO2	L2
d.	Outline the concept of data transformation.	CO2	L2
e.	Define the need of linear and polynomial regression.	CO3	L1
f.	Illustrate the applications of regression.	CO3	L2
g.	What is correlation? How it is different from R-square?	CO3	L1
h.	Summarize the clustering method of machine learning.	CO4	L2
i.	What is a fitness function in genetic algorithms?	CO5	L1
j.	Define the concept of Apriori algorithm.	CO5	L1
SECTION-B			
2.	Inspect the factors to be considered while solving a machine learning problem.	CO1	L4
3.	Apply feature scaling method in splitting of dataset into training and testing data.	CO2	L3
4.	Simplify the evaluating regression models performance methods of machine learning.	CO3	L4
5.	Identify the SVM method of machine learning with an	CO4	L3

	appropriate diagram.		
6.	Interpret the applications of artificial neural networks.	CO5	L5
SECTION-C			
7.	Compare the various types of machine learning. Choose an appropriate example to elaborate each technique in detail.	CO1	L5
8.	Evaluate the following methods of clustering: a) Partitioned Method b) Hierarchical Method	CO4	L5
9.	Analyze the concept of association in machine learning and also examine the Naïve Bayes algorithm.	CO5	L4

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Total No. of Questions: 09

B.Tech (CSE), Semester- 6th
MOBILE APPLICATION DEVELOPMENT
Subject Code: BTCS 620-18
M. Code: 79258
Date of Examination: 27-11-2025

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 role of JVM in executing Byte Code?	CO1	L1
b.	Explain in brief the main components of mobility landscape.	CO4	L2
c.	Recall the purpose of SQLite in android.	CO3	L1
d.	What are drawables in android?	CO4	L1
e.	Explain the significance of VUI.	CO3	L2
f.	Illustrate the purpose of Intent filter in a Broadcast Receiver.	CO2	L2
g.	Define multithreading in android.	CO5	L1
h.	Name two lifecycle methods of an activity.	CO1	L1
i.	List commonly used layout types in android.	CO2	L1
j.	Define multimedia in the context of android applications.	CO5	L1
SECTION-B			
2.	Explain the tools of android SDK used for mobile application development.	CO1	L5
3.	Identify different types of android user interface controls.	CO4	L3
4.	Examine how broadcast and telephony APIs are used in Android Studio.	CO3	L4
5.	Analyze various factors to be considered while developing a mobile application.	CO5	L4
6.	Evaluate the life cycle of an activity in an android application. Give various methods along with flow diagram for the same.	CO2	L5
SECTION-C			
7.	Explain how text-to-speech functionality is integrated in mobile application development.	CO3	L5
8.	Inspect the role of Threads, Async Task and Shared Preferences in mobile application development.	CO4	L4
9.	Identify in detail the android architecture with help of suitable diagram.	CO2	L3

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Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech CSE, Semester-7th
AGILE SOFTWARE DEVELOPMENT

Subject Code: BTCS 710 -18

M.Code: 90501

Date of Examination: 28-11-2025

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 the term Agile Software Development.	CO-1	L1
b.	Classify well-known Agile tools.	CO-1	L2
c.	What is the main difference between the Liskov Substitution Principle and the Interface Segregation Principle?	CO-2	L1
d.	Explain the differences between Scrum and Agile.	CO-2	L2
e.	List some of the advantages of pair programming.	CO-3	L1
f.	Outline the Application Binary Interface.	CO-3	L2
g.	Compare the terms Product Backlog with Sprint Backlog	CO-4	L2
h.	Examine the places where Scrum and Kanban methodologies are used.	CO-5	L2
i.	Explain the pair programming in Agile.	CO-6	L2
j.	How Extreme Programming is used in a Nutshell?	CO-6	L1
SECTION-B			
2.	Apply the Agile principle of "Continuous attention to technical excellence" to a real-world scenario where software equality is declining.	CO-1	L3
3.	Analyse the SOLID principles and how they contribute to maintainable code.	CO-2	L4
4.	Explain Artifacts? How do they affect the software development?	CO-3	L5
5.	In your Kanban project, team members are experiencing high levels of stress and burnout due to a constant demand for urgent work items. This has resulted in a decrease in the team's overall well-being and work quality. As a Kanban Project Manager, discuss how can you address the issue of stress and burnout and promote a healthier work environment for the team?	CO-4	L6

6.	Construct real life examples to categorize Test Driven Development (TDD) practices.	CO-6	L3
SECTION-C			
7.	Analyze the Agile Manifesto and principles that collectively solve the limitations of the Waterfall model.	CO-1	L4
8.	Identify the role of the Product Owner in Scrum. How does the Product Owner balance customer needs with development team capacity?	CO-4	L3
9.	Examine the role of metrics such as cycle time, lead time, and throughput in Kanban. How do these help in decision-making and process improvement?	CO-5	L5

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Roll No.

Total No. of Pages: 02

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B.Tech (CSE), Semester 7th
ADHOC AND WIRELESS SENSOR NETWORKS

Subject Code: BTCS-716-18

M.Code: 90507

Date of Examination: 02-12-2025

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 characteristics of sensor nodes.	CO-1	L1
b.	Interpret the role of control packets in routing protocols.	CO-1	L2
c.	How does S-MAC reduce energy consumption?	CO-2	L1
d.	Compare the goals of scalability and reliability in MAC design.	CO-2	L2
e.	List two quality of service (QoS) challenges in Ad Hoc routing.	CO-3	L1
f.	Explain why reliability is important in transport protocols.	CO-3	L2
g.	What is the contribution of System-on-Chip (SoC) design in WSN?	CO-4	L1
h.	Explain how on board storage supports WSN operation.	CO-4	L2
i.	List two vulnerabilities due to the open wireless medium.	CO-5	L1
j.	Classify attacks according to OSI layers.	CO-5	L2
SECTION-B			
2.	Utilize the concept of clustering to explain how scalability is achieved in large sensor networks.	CO-1	L3
3.	Classify MAC protocols for WSNs based on contention-based and schedule-based approaches.	CO-2	L4
4.	Justify the need for specialized transport protocols in Ad hoc wireless networks instead of using standard TCP.	CO-3	L5
5.	Examine the role of enabling technologies such as MEMS and low-power electronics in the development of WSNs.	CO-4	L4
6.	Justify the necessity of secure routing in Wireless Sensor Networks with an example.	CO-5	L5
SECTION-C			
7.	Examine the issues faced in the transport layer of WSNs and determine how they differ from traditional wireless networks.	CO-2	L4
8.	Distinguish between table-driven (proactive) protocols and on-demand (reactive) protocols with respect to bandwidth utilization and delay.	CO-3	L4

9.	Justify the use of energy-aware routing in WSNs by examining its role in prolonging network lifetime.	CO-4	L5
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Total No. of Pages: 1

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: 21-11-2025

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
SECTION-A			
1.	Answer briefly:	CO-1	L1
a.	What do you mean by a multidimensional data model?	CO-1	L2
b.	Explain the concept of "slice and dice" in mining.	CO-2	L1
c.	List two real-world applications of knowledge discovery in databases (KDD).	CO-2	L2
d.	Explain the meaning of association rule mining.	CO-3	L1
e.	Define association rule mining.	CO-3	L2
f.	Classify types of association rules.	CO-4	L1
g.	What is web page ranking?	CO-4	L2
h.	Show two benefits of using search engine software for enterprises.	CO-5	L1
i.	Define web data mining.	CO-5	L2
j.	What is the difference between web content and web usage mining?	CO-5	L2
SECTION-B			
2.	Analyze differences between ROLAP, MOLAP, and HOLAP with examples.	CO-1	L4
3.	Apply a data normalization method to a small dataset and show the result.	CO-2	L3
4.	Conclude the advantages and drawbacks of data reduction techniques in mining large datasets.	CO-3	L5
5.	Categorize enterprise search software by their features and deployment options.	CO-4	L4
6.	Evaluate how performance evaluation metrics (accuracy, time, scalability) affect tool selection for web mining.	CO-5	L5
SECTION-C			
7.	Analyze the concept of data cube computation to a sample multidimensional dataset and explain the results.	CO-1	L4
8.	Categorize and critique the evaluation metrics for pattern prediction accuracy in classification tasks.	CO-3	L4
9.	Evaluate and justify the integration of AI-based ranking algorithms in enterprise search engines.	CO-4	L5

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Total No. of Pages: 02

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

ROUTING AND SWITCHING

Subject Code: BTEC-905A-18

M.Code: 90691

Date of Examination: 96-11-2025

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 client-server network.	CO-1	L1
b.	Explain the function of a router in a computer network and describe how it determines the path for data transmission.	CO-1	L2
c.	Identify the role of the Destination MAC Address in an Ethernet frame.	CO-1	L2
d.	List any two advantages and disadvantages of circuit switching.	CO-2	L1
e.	Show the working of RIP with an example.	CO-2	L2
f.	Compare link state and distance vector routing protocol.	CO-2	L2
g.	What is the main concept behind creating VLANs?	CO-3	L1
h.	Explain how RAN solutions improve connectivity for remote or mobile users?	CO-3	L2
i.	How GRE is used in enterprise networks to connect remote branch offices or support multiprotocol traffic?	CO-4	L1
j.	Outline the role of Access Control List (ACL) in network security.	CO-4	L2
SECTION-B			
2.	Identify and explain with an example how Ethernet framing is applied to ensure reliable data transfer across a LAN.	CO-1	L3
3.	Classify the various responsibilities of a Transport Layer. Explain the Connection establishment and termination process by describing the three-way handshaking method.	CO-2	L4
4.	Evaluate the effectiveness of utilizing enterprise RAN technology to extend wireless services across a corporate	CO-3	L5

	campus, and justify its advantages over traditional WLAN solutions.																						
5.	Identify the various WAN Protocols that are used in network communication.	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.	<p>A network has 4 routers with the following link costs:</p> <table style="margin-left: 40px;"> <tr><td>*</td><td>R1-R2</td><td>=</td><td>2</td></tr> <tr><td>*</td><td>R1-R3</td><td>=</td><td>5</td></tr> <tr><td>*</td><td>R2-R3</td><td>=</td><td>1</td></tr> <tr><td>*</td><td>R2-R4</td><td>=</td><td>2</td></tr> <tr><td>*</td><td>R3-R4</td><td>=</td><td>3</td></tr> </table> <p>Given the same topology above, calculate the **OSPF cost** from R1 to R4.</p>	*	R1-R2	=	2	*	R1-R3	=	5	*	R2-R3	=	1	*	R2-R4	=	2	*	R3-R4	=	3	CO-2	L5
*	R1-R2	=	2																				
*	R1-R3	=	5																				
*	R2-R3	=	1																				
*	R2-R4	=	2																				
*	R3-R4	=	3																				
8.	Identify the various principles of Frame relay in detail. Explore its Advantages and Disadvantages.	CO-3	L3																				
9.	Critically evaluate the future of network security by comparing ACLs, IPsec VPNs, and GRE with modern SD-WAN solutions.	CO-4	L5																				

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Total No. of Pages: 02

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B.Tech (CSE), Semester 7th
NETWORK SECURITY AND CRYPTOGRAPHY

Subject Code: BTCS701-18

M.Code: 90487

Date of Examination: 18-11-2025

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.	How does cryptography ensure confidentiality?	CO-1	L1
b.	Outline the role of human errors in vulnerabilities.	CO-1	L2
c.	What does " $a \equiv b \pmod{n}$ " mean?	CO-2	L1
d.	Explain Euler's totient function $\phi(n)$.	CO-2	L2
e.	Define S-box in DES.	CO-3	L1
f.	Compare and Contrast AES-128, AES-192, and AES-256.	CO-3	L2
g.	What is the importance of hash functions in cryptography?	CO-4	L1
h.	Explain the purpose of the timestamps used in Kerberos tickets?	CO-4	L2
i.	List three primary functions of firewalls.	CO-5	L1
j.	Illustrate the role of Digital Signatures in PGP.	CO-5	L2
SECTION-B			
2.	Distinguish between a Threat and Attack. Classify the various categories of Network Security threats in detail.	CO-1	L4
3.	Apply the Euclidean Algorithm to compute GCD(240, 46) and explain how the result is useful in cryptography.	CO-2	L3
4.	Asses the security of Diffie–Hellman against man-in-the-middle attacks. How can digital signatures or certificates strengthen the protocol?	CO-3	L5
5.	Analyse the weaknesses of MD5. Why is MD5 no longer recommended for secure applications?	CO-4	L4
6.	Explain the concept of a honeypot. How is it used to detect and study attacks?	CO-5	L5

SECTION-C			
7.	Examine with example how breaches of Confidentiality, Integrity and Availability can impact an organization differently in terms of reputation, legal liability and financial Loss.	CO-1	L4
8.	Analyse in detail the strengths and limitations of Triple DES compared to DES. Why was it adopted as a temporary standard before AES?	CO-3	L4
9.	Explain the structure and working of SHA-1 algorithm. Describe the enhancements made in SHA-2 compared to SHA-1.	CO-4	L5

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