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 $a_n = \frac{2n-1}{(n+1)^{\frac{3}{2}}}$ 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 $u = \tan^{-1}(\frac{y^2}{x})$	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

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

Roll No. | | | | | | | | | | | | |

Total No. of Pages: 02

Total No. of Questions: 09

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

ENGINEERING MATHEMATICS - I

Subject Code: BTAM – 101 -23

M.Code: 93796

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 & 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.	Explain the necessary condition for the convergence of positive term series.	CO1	L2
b.	Define Ratio test for infinite series.	CO1	L1
c.	What is the formula for the volume of revolution about the initial line and pole perpendicular to the initial line.	CO2	L1
d.	Define Improper integrals of first kind.	CO2	L1
e.	If $u = x^y$, then show that $\frac{\partial^2 u}{\partial x \partial y} = \frac{\partial^2 u}{\partial y \partial x}$	CO3	L2
f.	~~Show~~ find that $\lim_{(x,y)\to(1,2)} \frac{2x^2y}{x^2+y^2+1}$	CO3	L2
g.	Find $\int_1^2 \int_1^3 x\, y^2\, dx\, dy$	CO4	L1
h.	Interpret the value of the integral $\int_0^2 \int_1^3 \int_0^{yz} x\, dx\, dy\, dz$.	CO4	L2

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 $\sum\left(\sqrt[3]{(n^3+1)}-n\right)$.	CO1	L4
3.	Solve the cardiod r = a (1- cos θ) 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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Roll No. | | | | | | | | | | | | | | Total No. of Pages: 02

Total No. of Questions: 09

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

MATHEMATICS - I

Subject Code: BTAM – 104 -18

M.Code: 75362

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 & C have FOUR questions each.
3. Each question of SECTION B & C consists of eight marks.
4. Attempt any FIVE questions from SECTION B & C, taking at least two questions from each section.

Q. No.	Question	Course Outcome	Bloom's Level
	SECTION-A		
1.	Answer briefly:		
a.	What is the general expression of Taylor's series.	CO1	L1
b.	Show that $\tan x > x > \sin x$ for all $x \in (0, \pi/2)$	CO1	L2
c.	Interpret the convergence of integral $\int_{-1}^{1} \frac{dx}{x^2}$	CO2	L2
d.	Show that $\beta(m, n) = \beta(n, m)$.	CO2	L2
e.	Define Linearly Independent set of vectors.	CO3	L1
f.	Let V be a Vector space in R^3. Interpret that $W = \{(a, b, c); a \geq b \geq c\}$ is a subspace of V or not.	CO3	L2
g.	Show that the matrix $\frac{1}{3}\begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & -2 \\ -2 & 2 & -1 \end{bmatrix}$ is orthogonal.	CO4	L1
h.	Find the eigen values of $A = \begin{bmatrix} 1 & 4 \\ 3 & 2 \end{bmatrix}$	CO4	L1
i.	Recall Rolle's theorem for the function $f(x) = x(x-3)^2$ on the interval [1, 4]	CO1	L1
j.	Define Rank of matrix A of order n x n.	CO4	L1

	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 $\lim_{x\to 0}(\frac{1}{x^2})^{\tan x}$	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 $\beta(m,n) = \frac{(m-1)!\ (n-1)!}{(m+n-1)!} : m, n > 0 \text{ and } m, n \in Z$	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

Roll No. | | | | | | | | | | | | | Total No. of Pages: 02

Total No. of Questions: 09

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

CHEMISTRY-I

Subject Code: BTCH101-18

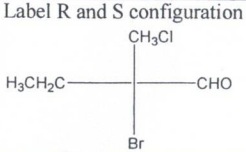
M.Code: 75343

Date of Examination: 02-12-2025

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

INSTRUCTIONS TO CANDIDATES:

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

Q. No.	Question	Course Outcome	Bloom's Level
	SECTION-A		
1.	Answer briefly:		
a.	What 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 diasteromers.	CO6	L1
g.	Show Anti-Markovnikoff addition of water in alkenes.	CO5	L2
h.	Label R and S configuration to the following: 	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.		
	(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 tranistions 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-dimentional 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 differert 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 E1 and E2 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

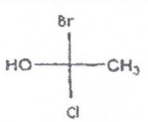
M.Code: 93800

Date of Examination: 02-12-2025

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

INSTRUCTIONS TO CANDIDATES:

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.	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 isomerim 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 $3Sn^{4+} + 2Cr \rightarrow 2Cr^{3+} + 3Sn^{2+}$ 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_2O, 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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Roll No. | | | | | | | | | | | | | Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (All Branches), (Sem.–1, 2)

BASIC ELECTRICAL ENGINEERING

Subject Code: BTEE101-18

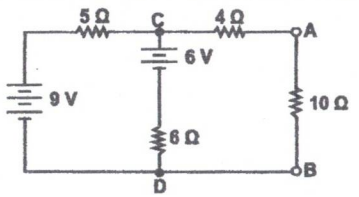
M.Code: 93797/75339

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 Ω 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 12Ω 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, 2000/200V, 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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Total No. of Questions: 09

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

PROGRAMMING FOR PROBLEM SOLVING

Subject Code: BTPS101-18

M.Code: 75346/ 93803

Date of Examination: 05-12-2025

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 & 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.	List the difference between RAM and ROM.	CO1	L1
b.	Illustrate the algorithm to find greatest of two integers' numbers.	CO2	L2
c.	Define the working of switch statement.	CO3	L1
d.	Outline the syntax of while loop.	CO3	L2
e.	Show the working of character array to print name in upper case letter.	CO4	L1
f.	Explain the working of 1D array	CO4	L2
g.	Tell the best case time complexity of linear search.	CO5	L1
h.	Show the example of user defined function.	CO5	L2
i.	Relate the "r" and "w modes " of file handling using C.	CO6	L1
j.	Illustrate the syntax of pointer.	CO6	L2
	SECTION-B		
2.	Build using C programming the source code and algorithm to check enter number is even or not.	CO2	L3
3.	Examine the working of arithmetic pointer using c programming.	CO6	L4
4.	Explain the memory structure of computer system with example.	CO1	L5
5.	Analyze the working of 2D array to add two matrices.	CO4	L4

	SECTION-C		
6.	Develop the structure of C programming in detail by considering the problem to find the factorial of 10 numbers.	CO1	L3
7.	Explain the working of Bubble sort using source code.	CO5	L5
8.	Categorize the various decision making statements in detail with example.	CO3	L4
9.	Evaluate the quadratic equation to find roots are real or imaginary using algorithm and source code.	CO2	L5

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Total No. of Pages:02

Total No. of Questions: 09

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

Chemistry-I

Subject Code: 25C1CHU-101

M.Code:

Date of Examination: 19-12-2025

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.	What is physical significance of ψ and ψ^2 ?	CO-1	L1
b.	Summarize Huckel's rule of aromaticity with an example.	CO-1	L2
c.	How hard water differs from soft water?	CO-2	L1
d.	Compare the terms oxidation and reduction?	CO-2	L2
e.	Why is TMS used as an internal standard in NMR spectroscopy?	CO-3	L1
f.	Show stretching vibrations with suitable examples.	CO-3	L2
g.	Outline the shape of XeF_4 on the basis of VSEPR theory.	CO-4	L2
h.	Show an example of aliphatic electrophilic substitution reaction.	CO-5	L2
i.	Explain the concept of structural isomerism.	CO-6	L2
j.	Recall one example of each: Position isomerism and Functional isomerism.	CO-6	L1
	SECTION-B		
2.	Doping Germanium with Phosphorous give rise to n-type semiconductor whereas, it's doping with Boron gives p-type semiconductor. Justify your answer by applying band theory.	CO-1	L3
3.	Simplify the term corrosion and examine the factors which promote electrochemical corrosion? Also, List different methods that can be used to prevent corrosion.	CO-2	L4
4.	Determine the number of distinct ^1H NMR signals and splitting pattern (high resolution NMR) for the following: (a) 1,2-dichloroethane (b) 1,1-dichloroethane	CO-3	L5

5.	Solve how VSEPR theory can be applied to predict the geometry of molecules with up to 6 electron pairs through some examples.	CO-4	L3
6.	Identify the chirality and optical activity terms. Also how chirality can be applied to find optical activity in the compounds.	CO-6	L4
	SECTION-C		
7.	Evaluate the crystal field splitting of d-orbitals in octahedral complexes and justify the formation of high-spin and low-spin complexes	CO-1	L5
8.	(a) What is electron affinity? Apply your knowledge of atomic size and electronic repulsion to explain why chlorine has a higher electron affinity than fluorine. (b) Identify the isoelectronic from the following species and arrange them in increasing ionic radii by applying effect of increasing nuclear charge on their size : O^{2-}, F^-, Na^+, Mg^{2+}	CO-4	L3
9.	Analyze the mechanism of nucleophilic addition to carbonyl compounds and explain why aldehydes are generally more reactive than ketones.	CO-5	L4

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Roll No. | | | | | | | | | | | | |

Total No. of Pages: 2

Total No. of Questions: 09

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

ENGINEERING PHYSICS

Subject Code: BTPH101-23

M.Code: 93794

Date of Examination: 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 $1/\vec{r}$ 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

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

Roll No. | | | | | | | | | | | |

Total No. of Questions: 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:

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

Q. No.	Question	Course Outcome	Bloom's Level
	SECTION-A		
1.	Answer briefly:		
a.	**Select 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.	Read the following paragraph and choose the correct answer from the paragraph for the questions that follow: 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. **Questions:** i. Analyze the main argument presented in this paragraph. What is the author's central idea/thesis about the digital generation gap? ii. Identify and explain two specific differences between younger and older generations mentioned in the text. How do these differences affect their daily lives? 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. iv. Analyze the solution proposed by the author in the final sentence. Do you think this approach is realistic? Give your view point. v. Give antonyms of "excessive" and "deep".	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.	**Make use of the appropriate subject-verb agreement rules and correct the following sentences:** i. The man and the woman has absconded. ii. A dictionary and an atlas is missing from the library. iii. The children as well as their mother is missing. iv. Neither the students nor the teacher are satisfied with the results. v. The list of complaints have been submitted.	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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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.**

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

	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

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Roll No. | | | | | | | | | | | | | |

Total No. of Pages: 2

Total No. of Questions: 09

B. Tech (All branches)(Sem.-2)

ENGINEERING MATHEMATICS-2

Subject Code: BTAM201-23

M. Code: 93811

Date of Examination: 20-12-2025

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 & C have FOUR questions each.
3. Each question of SECTION B & C consists of eight marks.
4. Attempt any FIVE questions from SECTION B & C, taking at least two questions from each section.

Q. No.	Question	Course Outcome	Bloom's Level
	SECTION-A		
1.	Answer briefly:		
a.	Find the row echelon form of matrix $\begin{bmatrix} 2 & 3 & 4 \\ 4 & 3 & 1 \\ 1 & 2 & 4 \end{bmatrix}$.	CO1	L1
b.	Illustrate the Rank Nullity theorem with an example.	CO2	L2
c.	Examine whether $T: R^2 \rightarrow R^3$ defined by $T(x, y) = (x + y, x - y, y)$ is a linear transformation or not.	CO2	L2
d.	Find the general solution of differential equation $\sec^2 x \tan y dx + \tan x \sec^2 y dy = 0$.	CO4	L1
e.	Find sum and product of Eigen values of the matrix $\begin{bmatrix} -2 & 1 \\ -3 & 1 \end{bmatrix}$.	CO3	L1
f.	Interpret whether the given equation $(1 + x^2)\, dy + 2xydx = 0$ is exact.	CO4	L2
g.	What is an auxiliary equation of Charpit's method ?	CO6	L1
h.	Explain how to obtain the complete solution of $(D^2 + 6D + 9)y = 0$.	CO4	L2
i.	Show that the orthogonal trajectories of the curve $y^2 = 4ax$ is $2x^2 + y^2 = c$.	CO5	L2
j.	Define Similar and diagonalizable matrices.	CO1	L1
	SECTION-B		
2.	Apply the method of variation of parameters to solve $y'' - 6y' + 9y = \frac{e^{3x}}{x^2}$.	CO4	L3

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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Total No. of Questions: 09

B. Tech (All branches)(Sem.-2)

ENGINEERING MATHEMATICS-2

Subject Code: BTAM201-23

M. Code: 93811

Date of Examination: 20-12-2025

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 & C have FOUR questions each.**
3. **Each question of SECTION B & C consists of eight marks.**
4. **Attempt any FIVE questions from SECTION B & C, taking at least two questions from each section.**

Q. No.	Question	Course Outcome	Bloom's Level
	SECTION-A		
1.	Answer briefly:		
a.	Find the row echelon form of matrix $\begin{bmatrix} 2 & 3 & 4 \\ 4 & 3 & 1 \\ 1 & 2 & 4 \end{bmatrix}$.	CO1	L1
b.	Illustrate the Rank Nullity theorem with an example.	CO2	L2
c.	Examine whether $T: R^2 \rightarrow R^3$ defined by $T(x, y) = (x + y, x - y, y)$ is a linear transformation or not.	CO2	L2
d.	Find the general solution of differential equation $\sec^2 x \tan y dx + \tan x \sec^2 y dy = 0$.	CO4	L1
e.	Find sum and product of Eigen values of the matrix $\begin{bmatrix} -2 & 1 \\ -3 & 1 \end{bmatrix}$.	CO3	L1
f.	Interpret whether the given equation $(1 + x^2)\, dy + 2xydx = 0$ is exact.	CO4	L2
g.	What is an auxiliary equation of Charpit's method ?	CO6	L1
h.	Explain how to obtain the complete solution of $(D^2 + 6D + 9)y = 0$.	CO4	L2
i.	Show that the orthogonal trajectories of the curve $y^2 = 4ax$ is $2x^2 + y^2 = c$.	CO5	L2
j.	Define Similar and diagonalizable matrices.	CO1	L1
	SECTION-B		
2.	Apply the method of variation of parameters to solve $y'' - 6y' + 9y = \frac{e^{3x}}{x^2}$.	CO4	L3

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 $x = acoskt + bsinkt$, 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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Total No. of Pages: 2

Total No. of Questions: 09

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

MATHEMATICS-2

Subject Code: BTAM204-18

M.Code: 76257/91960

Date of Examination:20-12-2025

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 & C have FOUR questions each.
3. Each question of SECTION B & C consists of eight marks.
4. Attempt any FIVE questions from SECTION B & C, taking at least two questions from each section.

Q. No.	Question	Course Outcome	Bloom's Level
	SECTION-A		
1.	Answer briefly:		
a.	Find mean of 20,22,25,28,30.	CO1	L1
b.	What are Type- I and Type-II errors in Sampling ?	CO4	L1
c.	Given Cov(X,Y)=15, Var(X)=36, Var(Y)= 25, Find Coefficient of correlation and regression coefficient for X on Y .	CO3	L1
d.	Explain null hypothesis.	CO4	L2
e.	Explain continuous random variable.	CO2	L2
f.	The distribution function for a random variable X is $F(x) = \begin{cases} e^{-2x}, & x \geq 0 \\ 0, & x < 0 \end{cases}$ Using definition of c.d.f. find: $P(X > 3)$.	CO2	L1
g.	Using $b_{xy} = -0.89$; $b_{yx} = -0.11$, interpret Karl-Pearson co-efficient of correlation . Comment on validity of data.	CO3	L2
h.	The time required to repair a machine is exponentially distributed with parameter 0.5. What is the probability that a repair time exceeds 2 hours?	CO2	L1
i.	Using mean and variance of binomial distribution which are 4 and4/3.Find $P(X \geq 1)$.	CO2	L1
j.	What do you mean by degree of freedom in testing of hypothesis ?	CO4	L1
	SECTION-B		
2.	Fit a binomial distribution to the following data:	CO2	L3

X	0	1	2	3	4
F	30	62	46	10	2

3.	From the following data determine "r"and the two regression equations X: 1, 2, 3, 4, 5 Y: 2, 5, 3, 8, 7	CO3	L5
4.	Find mean, standard deviation and coefficient of variation for the data given below: Marks: 0-10, 10-20, 20-30, 30-40, 40-50, 50-60 No. of students: 5, 10, 25, 30, 20, 10	CO1	L4
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. X : 8 12 16 20 24 P(X) : 1/8 1/6 3/8 1/4 1/12	CO2	L3
8.	Analyze skewness and kurtosis for the following data. Marks: 5-15, 15-25, 25-35, 35-45, 45-55 No. of students: 1, 3, 5, 7, 4	CO1	L4
9.	Using suitable method of correlation evaluate coefficient of correlation for the marks given by Judge A: 10, 15, 15, 20, 18, 16, 15 Judge B: 16, 18, 16, 20, 20, 18, 12	CO3	L5

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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

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

INSTRUCTIONS TO CANDIDATES:

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

Q. No.	Question	Course Outcome	Bloom's Level
	SECTION-A		
1.	Answer briefly:		
a.	What do you mean by 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:	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 X: 0 | 1 | 2 | 3 | 4 | 5 | 6 P(X): k | 3k | 5k | 7k | 9k | 11k | 13k Solve: (a) the value of k (b) $P(X \geq 4)$ and $P(2 < X \leq 5)$	CO-2	L3
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 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
6.	Two types of drugs were used to control the high blood pressures on 6 and 8 patients and decreases in systolicblood pressres (upper limit of B.P.) are as below: Drug A: 12 | 18 | 30 | 15 | 7 | 14 | | Drug B: 15 | 16 | 12 | 10 | 21 | 25 | 28 | 17 Interpret if there is any significant difference in the efficiency of drugs?	CO-5	L5
	SECTION-C		
7.	From the following data calculate Karl Pearson's coefficient of skewness: 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
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 Sales: 91 | 97 | 108 | 121 | 67 | 124 | 51 | 73 | 111 | 57 Purchase: 71 | 75 | 69 | 97 | 70 | 91 | 39 | 61 | 80 | 47 (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.	CO-4	L3

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Roll No. | | | | | | | | | | | | | Total No. of Pages: 02

Total No. of Questions:09

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

OBJECT ORIENTED PROGRAMMING

Subject Code: - BTCS302-18

M.Code: 76437

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.	What is the use of the modulus (%) operator in C++?	CO-1	L1
b.	Explain the difference between while loop and do while loop with syntax.	CO-1	L2
c.	Show how a parameterized constructor can be used to initialize the objects.	CO-2	L1
d.	Explain a constructor in C++.	CO-2	L2
e.	Define ambiguity in inheritance.	CO-3	L1
f.	Demonstrate how a derived class access private members of a base class? Justify your answer.	CO-3	L2
g.	When is early binding used in C++?	CO-4	L1
h.	Compare compile-time and run-time polymorphism.	CO-4	L2
i.	Define a stream and explain how it simplifies I/O operations.	CO-5	L1
j.	Demonstrate the role of fstream in performing both input and output.	CO-5	L2
	SECTION-B		
2.	Compare significance of the public, private, and protected access specifiers in a class? Explain with an example.	CO-1	L4
3.	Construct a Counter class with a static data member to keep track of the number of objects created.	CO-2	L3
4.	Evaluate the different types of inheritance, why hybrid inheritance is considered more complex than other types.	CO-3	L5
5.	Examine the concept of late binding in C++, explaining how it operates when a derived class overrides a base class function.	CO-4	L4
6.	Explain File pointer and various functions for manipulation of file pointer. Justify your explanation with a program.	CO-5	L5

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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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

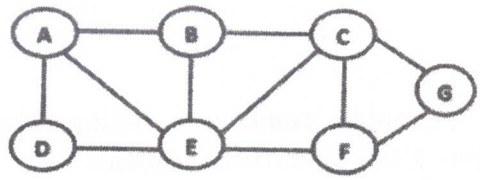
M.Code: 76436

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 ^ D - E) ^ (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 mod 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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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 +A C.	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 $f(A,B,C,D)=\Pi M(0,2,4,6,8,10,12,14) + d(1,11,13,15)$	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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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 charcterized 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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Total No. of Questions: 09

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

OPERATING SYSTEMS

Subject Code: BTCS-402-18

M. Code: 77628

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.	Questions	Course Outcomes	Bloom's Level
	SECTION-A		
1.	**Answer briefly:**		
a.	Define soft RTS.	CO1	L1
b.	Outline any two advantages of LINUX operating systems.	CO1	L2
c.	What do you mean by PCB?	CO2	L1
d.	Illustrate the critical section problem in brief.	CO2	L2
e.	What is convoy effect?	CO3	L1
f.	Compare and Contrast between preemptive and non-preemptive scheduling?	CO3	L2
g.	Explain any two characteristics of virtual memory concept.	CO4	L2
h.	Explain the term file system in brief.	CO5	L2
i.	Summarize the need of I/O traffic controller.	CO6	L2
j.	What is meant by seek time and rotational latency in case of disk drive?	CO6	L1

	SECTION-B		
2.	Make use of a block diagram to discuss the layered structure of an Operating System.	CO1	L3
3.	Examine the role of scheduler in detail. Differentiate among short, medium and long term scheduler.	CO2	L4
4.	Explain the concept of deadlock in Operating System and interpret the four necessary conditions for a deadlock situation to arise.	CO3	L5
5.	A block manager for a variable size region strategy has a free list of blocks of size 600, 1400, 1000, 2200, 1600 and 1050 bytes. Elaborate, which block size will be selected to honor a request for 1605 bytes using best fit policy.	CO4	L6
6.	Analyze the concept of disk scheduling by discussing SSTF, C-SCAN disk scheduling algorithm with the help of an example.	CO6	L4
	SECTION-C		
7.	Consider the following set of processes, with the length of the CPU-burst time given in milliseconds: Process | Burst Time | Arrival time P1 | 5 | 0 P2 | 3 | 1 P3 | 1 | 2 P4 | 3 | 3 P5 | 5 | 4 The processes are assumed to have arrived in the order P1, P2, P3, P4, and P5. a. Apply FCFS and preemptive SJF (Shortest Job First) to draw two Gantt charts illustrating the execution of these processes. b. What is the turnaround time of each process for each of the scheduling algorithms in part a? c. What is the waiting time of each process for each of the scheduling algorithms in part a?	CO3	L3
8.	Discover the number of page faults using First in First Out (FIFO) and Least Recently Used(LRU) page replacement algorithm for given series of page references if the size of frame is 4. 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1	CO4	L4
9.	Explain the Contiguous, Linked and Indexed methods of file allocation in detail with the help of an example.	CO5	L5.

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Total No. of Pages: 02

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B.Tech (CSE/AIML/AIDS/DS/IoT), Semester: 4th

COMPUTER ORGANIZATION AND ARCHITECTURE

Subject Code: BTES - 401-18

M. Code: 77627

Date of Examination: 24-11-2025

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.	What is an interrupt?	CO1	L1
b.	Illustrate the significance of address and data bus.	CO1	L2
c.	What is the advantage of using carry look-ahead adder?	CO2	L1
d.	What is the role of cache memory?	CO5	L1
e.	Define the function of flag register in 8085 MP.	CO1	L1
f.	Explain the concept of memory interleaving.	CO5	L2
g.	Infer how many address lines are required to address the 1000 memory locations.	CO5	L2
h.	What is a control unit ?	CO3	L1
i.	Outline the usage of parallel processing.	CO4	L2
j.	What is a privileged instruction?	CO3	L1

	SECTION-B		
2.	Analyze the Flynn's classification of the processors with appropriate diagrams.	CO4	L4
3.	Evaluate the micro programmed and hardwired design approaches of a control unit.	CO3	L5
4.	Identify the various addressing modes of microprocessor 8085 and select an appropriate instruction to explain each.	CO2	L3
5.	Examine any four memory replacement algorithms with appropriate examples.	CO5	L4
6.	By examining the instruction format and its constituent parts, categorise the instructions according to their size.	CO2	L4
	SECTION-C		
7.	Construct an architectural diagram of microprocessor 8085 and explain in detail.	CO1	L3
8.	Choose an appropriate diagram to design a hypothetical CPU and also identify the role of each part.	CO3	L6
9.	Explain the basic concept of pipelining with a real life example and derive the expressions for throughput and speedup.	CO4	L5

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Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (CSE/AIML/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:

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.	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

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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Total No. of Questions: 09

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

DISCRETE MATHEMATICS

Subject Code: BTCS-401-18

M.Code: 77626

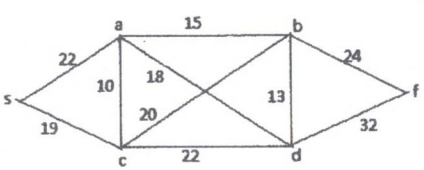
Date of Examination: 11-12-2025

Time: 3 Hrs. Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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 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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Total No. of Questions: 11

B. Tech (CSE/ECE/AIML/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:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
2. SECTION-B contains FIVE questions carrying FOUR marks each and students have to attempt all the questions.
3. 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 कैसेबनाए रख सकते हैं? ਤੁਸੀਂ ਰਿਸ਼ਤੇ ਵਿੱਚ ਸਦਭਾਵਨਾ ਕਿਵੇਂਬਣਾਈ ਰੱਖ ਸਕਦੇ ਹੋ?	CO1	L1
b.	Outline the basic guidelines for value education. मूल्य शिक्षा के लिए बुनियादी दिशा-निर्देशों की रूपरेखा तैयार करें। ਮੁੱਲ ਸਿੱਖਿਆ ਲਈ ਬੁਨਿਆਦੀ ਦਿਸ਼ਾ-ਨਿਰਦੇਸ਼ਾਂ ਦੀ ਰੂਪ ਰੇਖਾ ਤਿਆਰ ਕਰੋ।	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। ਉਨ੍ਹਾਂ ਸਮੱਸਿਆਵਾਂ ਦੀ ਸੂਚੀ ਬਣਾਓ ਜਿਨ੍ਹਾਂ ਦਾ ਅਸੀਂ ਅੱਜ ਸਾਹਮਣਾ ਕਰ ਰਹੇ ਹਾਂ ਕਿਉਂਕਿ ਅਸੀਂ ਪਹਿਲਾਂ ਤੋਂ ਨਿਰਧਾਰਤ ਇੱਛਾਵਾਂ ਅਤੇ ਸੰਵੇਦਨਾ ਦੇ ਅਧਾਰ 'ਤੇ ਕੰਮ ਕਰ ਰਹੇ ਹਾਂ।	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। ਵਿਆਖਿਆ ਕਰੋ, ਅਸੀਂ ਟਕਰਾਅ ਵਿੱਚ ਕਿਵੇਂ ਜਾਂਦੇ ਹਾਂ ਜਦੋਂ ਸਾਡੀਆਂ ਗਤੀਵਿਧੀਆਂ ਸਾਡੀ ਕੁਦਰਤੀ ਪ੍ਰਵਾਨਗੀ ਦੁਆਰਾ ਨਿਰਦੇਸ਼ਿਤ ਨਹੀਂ ਹੁੰਦੀਆਂ।	CO2	L2

e.	What is prosperity? Is it different from happiness? समृद्धि क्या है? क्या यह खुशी से अलग है? ਖੁਸ਼ਹਾਲੀ ਕੀ ਹੈ? ਕੀ ਇਹ ਖ਼ੁਸ਼ੀ ਤੋਂ ਵੱਖਰਾ ਹੈ?	CO3	L1
f.	Infer natural acceptance of human values. मानवीय मूल्यों की स्वाभाविक स्वीकृति। ਮਨੁੱਖੀ ਕਦਰਾਂ-ਕੀਮਤਾਂ ਦੀ ਕੁਦਰਤੀ ਪ੍ਰਵਾਨਗੀ।	CO3	L2
g.	Summarize what humanistic education is all about. संक्षेप में बताइए कि मानवतावादी शिक्षा क्या है। ਸੰਖੇਪ ਵਿੱਚ ਦੱਸੋ ਕਿ ਮਨੁੱਖਤਾਵਾਦੀ ਸਿੱਖਿਆ ਕੀ ਹੈ।	CO4	L2
h.	Explain natural acceptance of human values. मानवीय मूल्यों की स्वाभाविक स्वीकृति की व्याख्या कीजिए। ਮਨੁੱਖੀ ਕਦਰਾਂ-ਕੀਮਤਾਂ ਦੀ ਕੁਦਰਤੀ ਪ੍ਰਵਾਨਗੀ ਦੀ ਵਿਆਖਿਆ ਕਰੋ।	CO4	L2
i.	Illustrate the term self-regulation in nature. प्रकृति में स्व-नियमन शब्द का चित्रण करें। ਕੁਦਰਤ ਵਿੱਚ ਸਵੈ-ਨਿਯੰਤ੍ਰਣ ਸ਼ਬਦ ਦੀ ਵਿਆਖਿਆ ਕਰੋ।	CO5	L2
j.	Define Ethical Human Conduct. नैतिक मानव आचरण को परिभाषित कीजिए। ਨੈਤਿਕ ਮਨੁੱਖੀ ਆਚਰਣ ਨੂੰ ਪਰਿਭਾਸ਼ਿਤ ਕਰੋ।	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। ਕੁਦਰਤ ਵਿੱਚ ਸਦਭਾਵਨਾ ਦੀ ਵਰਤੋਂ ਕਰੋ ਅਤੇ ਕੁਦਰਤ ਦੇ ਨਾਲ ਸਹਿ-ਹੋਂਦ ਦੇ ਅਰਥ ਦੀ ਪਛਾਣ ਕਰੋ।	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। "ਹੁਨਰ ਅਤੇ ਮਨੁੱਖੀ ਕਦਰਾਂ-ਕੀਮਤਾਂ ਪੂਰਕ ਹਨ"। ਉਦਾਹਰਣ ਦੇ ਨਾਲ ਇਸ ਕਥਨ ਦਾ ਵਿਸ਼ਲੇਸ਼ਣ ਕਰੋ।	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। ਮਨੁੱਖੀ ਯਤਨਾਂ ਦੇ ਪੰਜ ਪਹਿਲੂਆਂ ਅਤੇ ਉਹ ਵਿਆਪਕ ਮਨੁੱਖੀ ਟੀਚਿਆਂ ਨੂੰ ਪ੍ਰਾਪਤ ਕਰਨ ਵਿੱਚ ਕਿਵੇਂ ਮਦਦਗਾਰ ਹਨ, ਬਾਰੇ ਵਿਸਤਾਰ ਨਾਲ ਦੱਸੋ।	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. 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। ਕੁਦਰਤ ਦੇ ਚਾਰ ਆਦੇਸਾਂ 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. पेशेवर 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। ਪੇਸ਼ੇਵਰ ਨੈਤਿਕਤਾ ਵਿੱਚ ਮੌਜੂਦਾ ਮੁੱਦਿਆਂ ਦੀ ਪਛਾਣ ਕਰਨ ਲਈ ਨੈਤਿਕ ਸਿਧਾਂਤਾਂ 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. मानव आकांक्षाओं को पूरा करने के लिए विभिन्न बुनियादी आवश्यकताओं को विस्तार से समझाइए। 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. 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। ਮਨੁੱਖੀ ਅਤੇ ਪਸ਼ੂ ਚੇਤਨਾ ਦਰਮਿਆਨ ਅੰਤਰਾਂ 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. 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

	ਇੱਕ ਅਟੁੱਟ ਸਮਾਜ ਅਤੇ ਸਰਬਵਿਆਪੀ ਵਿਵਸਥਾ ਦੀ ਧਾਰਨਾ ਨੂੰ ਨਿਰਧਾਰਤ ਕਰੋ ਅਤੇ ਸਮਝਾਓ ਕਿ ਇਹ ਦੋਵੇਂ ਇੱਕ ਵਿਸ਼ਵ ਪਰਿਵਾਰ ਬਣਾਉਣ ਵਿੱਚ ਕਿਵੇਂ ਮਦਦ ਕਰ ਸਕਦੇ ਹਨ।		
10.	Analyze the universal human order and examine your role in progressing toward it. सार्वभौमिक मानव व्यवस्था का विश्लेषण करें और इस दिशा में आगे बढ़ने में अपनी भूमिका की जांच करें। ਸਰਬਵਿਆਪੀ ਮਨੁੱਖੀ ਵਿਵਸਥਾ ਦਾ ਵਿਸ਼ਲੇਸ਼ਣ ਕਰੋ ਅਤੇ ਇਸ ਵੱਲ ਵਧਣ 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। ਸਵੈ-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.

Roll No. | | | | | | | | | | | | | | Total No. of Pages:04

Total No. of Questions: 11

B. Tech (CSE/ECE/AIML/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:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
2. SECTION-B contains FIVE questions carrying FOUR marks each and students have to attempt all the questions.
3. 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 कैसेबनाए रख सकते हैं? ਤੁਸੀਂ ਰਿਸ਼ਤੇ ਵਿੱਚ ਸਦਭਾਵਨਾ ਕਿਵੇਂਬਣਾਈ ਰੱਖ ਸਕਦੇ ਹੋ?	CO1	L1
b.	Outline the basic guidelines for value education. मूल्य शिक्षा के लिए बुनियादी दिशा-निर्देशों की रूपरेखा तैयार करें। ਮੁੱਲ ਸਿੱਖਿਆ ਲਈ ਬੁਨਿਆਦੀ ਦਿਸ਼ਾ-ਨਿਰਦੇਸ਼ਾਂ ਦੀ ਰੂਪ ਰੇਖਾ ਤਿਆਰ ਕਰੋ।	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| ਉਨ੍ਹਾਂ ਸਮੱਸਿਆਵਾਂ ਦੀ ਸੂਚੀ ਬਣਾਓ ਜਿਨ੍ਹਾਂ ਦਾ ਅਸੀਂ ਅੱਜ ਸਾਹਮਣਾ ਕਰ ਰਹੇ ਹਾਂ ਕਿਉਂਕਿ ਅਸੀਂ ਪਹਿਲਾਂ ਤੋਂ ਨਿਰਧਾਰਤ ਇੱਛਾਵਾਂ ਅਤੇ ਸੰਵੇਦਨਾ ਦੇ ਅਧਾਰ 'ਤੇ ਕੰਮ ਕਰ ਰਹੇ ਹਾਂ|	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| ਵਿਆਖਿਆ ਕਰੋ, ਅਸੀਂ ਟਕਰਾਅ ਵਿੱਚ ਕਿਵੇਂ ਜਾਂਦੇ ਹਾਂ ਜਦੋਂ ਸਾਡੀਆਂ ਗਤੀਵਿਧੀਆਂ ਸਾਡੀ ਕੁਦਰਤੀ ਪ੍ਰਵਾਨਗੀ ਦੁਆਰਾ ਨਿਰਦੇਸ਼ਿਤ ਨਹੀਂ ਹੁੰਦੀਆਂ|	CO2	L2

e.	What is prosperity? Is it different from happiness? समृद्धि क्या है? क्या यह खुशी से अलग है? ਖੁਸ਼ਹਾਲੀ ਕੀ ਹੈ? ਕੀ ਇਹ ਖੁਸ਼ੀ ਤੋਂ ਵੱਖਰਾ ਹੈ?	CO3	L1
f.	Infer natural acceptance of human values. मानवीय मूल्यों की स्वाभाविक स्वीकृति| ਮਨੁੱਖੀ ਕਦਰਾਂ-ਕੀਮਤਾਂ ਦੀ ਕੁਦਰਤੀ ਪ੍ਰਵਾਨਗੀ|	CO3	L2
g.	Summarize what humanistic education is all about. संक्षेप में बताइए कि मानवतावादी शिक्षा क्या है। ਸੰਖੇਪ ਵਿੱਚ ਦੱਸੋ ਕਿ ਮਨੁੱਖਤਾਵਾਦੀ ਸਿੱਖਿਆ ਕੀ ਹੈ।	CO4	L2
h.	Explain natural acceptance of human values. मानवीय मूल्यों की स्वाभाविक स्वीकृति की व्याख्या कीजिए। ਮਨੁੱਖੀ ਕਦਰਾਂ-ਕੀਮਤਾਂ ਦੀ ਕੁਦਰਤੀ ਪ੍ਰਵਾਨਗੀ ਦੀ ਵਿਆਖਿਆ ਕਰੋ।	CO4	L2
i.	Illustrate the term self-regulation in nature. प्रकृति में स्व-नियमन शब्द का चित्रण करें। ਕੁਦਰਤ ਵਿੱਚ ਸਵੈ-ਨਿਯੰਤ੍ਰਣ ਸ਼ਬਦ ਦੀ ਵਿਆਖਿਆ ਕਰੋ।	CO5	L2
j.	Define Ethical Human Conduct. नैतिक मानव आचरण को परिभाषित कीजिए। ਨੈਤਿਕ ਮਨੁੱਖੀ ਆਚਰਣ ਨੂੰ ਪਰਿਭਾਸ਼ਿਤ ਕਰੋ।	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। ਕੁਦਰਤ ਵਿੱਚ ਸਦਭਾਵਨਾ ਦੀ ਵਰਤੋਂ ਕਰੋ ਅਤੇ ਕੁਦਰਤ ਦੇ ਨਾਲ ਸਹਿ-ਹੋਂਦ ਦੇ ਅਰਥ ਦੀ ਪਛਾਣ ਕਰੋ।	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| "ਹੁਨਰ ਅਤੇ ਮਨੁੱਖੀ ਕਦਰਾਂ-ਕੀਮਤਾਂ ਪੂਰਕ ਹਨ"। ਉਦਾਹਰਣ ਦੇ ਨਾਲ ਇਸ ਕਥਨ ਦਾ ਵਿਸ਼ਲੇਸ਼ਣ ਕਰੋ|	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। ਮਨੁੱਖੀ ਯਤਨਾਂ ਦੇ ਪੰਜ ਪਹਿਲੂਆਂ ਅਤੇ ਉਹ ਵਿਆਪਕ ਮਨੁੱਖੀ ਟੀਚਿਆਂ ਨੂੰ ਪ੍ਰਾਪਤ ਕਰਨ ਵਿੱਚ ਕਿਵੇਂ ਮਦਦਗਾਰ ਹਨ, ਬਾਰੇ ਵਿਸਤਾਰ ਨਾਲ ਦੱਸੋ।	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. 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। 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. पेशेवर 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। ਪੇਸ਼ੇਵਰ ਨੈਤਿਕਤਾ ਵਿੱਚ ਮੌਜੂਦਾ ਮੁੱਦਿਆਂ ਦੀ ਪਛਾਣ ਕਰਨ ਲਈ ਨੈਤਿਕ ਸਿਧਾਂਤਾਂ 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. मानव आकांक्षाओं को पूरा करने के लिए विभिन्न बुनियादी आवश्यकताओं को विस्तार से समझाइए। 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. 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। ਮਨੁੱਖੀ ਅਤੇ ਪਸ਼ੂ ਚੇਤਨਾ ਦਰਮਿਆਨ ਅੰਤਰਾਂ 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. 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। ਇੱਕ ਅਟੁੱਟ ਸਮਾਜ ਅਤੇ ਸਰਬਵਿਆਪੀ ਵਿਵਸਥਾ ਦੀ ਧਾਰਨਾ ਨੂੰ ਨਿਰਧਾਰਤ ਕਰੋ ਅਤੇ ਸਮਝਾਓ ਕਿ ਇਹ ਦੋਵੇਂ ਇੱਕ ਵਿਸ਼ਵ ਪਰਿਵਾਰ ਬਣਾਉਣ ਵਿੱਚ ਕਿਵੇਂ ਮਦਦ ਕਰ ਸਕਦੇ ਹਨ।	CO4	L5

10.	Analyze the universal human order and examine your role in progressing toward it. सार्वभौमिक मानव व्यवस्था का विश्लेषण करें और इस दिशा में आगे बढ़ने में अपनी भूमिका की जांच करें। ਸਰਬਵਿਆਪੀ ਮਨੁੱਖੀ ਵਿਵਸਥਾ ਦਾ ਵਿਸ਼ਲੇਸ਼ਣ ਕਰੋ ਅਤੇ ਇਸ ਵੱਲ ਵਧਣ 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| ਸਵੈ-ਸੰਗਠਨ ਅਤੇ ਸਿਹਤ ਦੀ ਵਿਆਖਿਆ ਕਰੋ| ਕੁਦਰਤ ਵਿੱਚ ਸਦਭਾਵਨਾ ਪ੍ਰਾਪਤ ਕਰਨ ਵਿੱਚ ਉਹਨਾਂ ਦੀ ਭੂਮਿਕਾ ਦਾ ਮੁਲਾਂਕਣ ਕਰੋ|	CO1	L5

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

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

PROGRAMMING IN PYTHON

Subject Code: BTAIML 501-20

M.Code: 93173/93939/92370/92344

Date of Examination: 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 *if*, *if-else*, and *if-elif-else* 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 Questions: 09

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

ARTIFICIAL INTELLIGENCE

Subject Code: BTAIML 502-20

M.Code: 93940/93174/92345

Date of Examination: 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.	What is the term for a heuristic function that never overestimates the cost to the goal?	CO-1	L1
b.	Compare uninformed search strategies with heuristic search strategies.	CO-1	L2
c.	Define propositional logic and give one example of a simple proposition.	CO-2	L1
d.	Demonstrate how a node is expanded in A* search with a simple example.	CO-2	L2
e.	List two common issues in Knowledge Representation.	CO-3	L1
f.	Explain why acting under uncertainty requires a different approach than logical reasoning.	CO-3	L2
g.	Name the key component used to represent knowledge in Winston's Learning Program.	CO-4	L1
h.	How does a Decision Tree use attributes to make a decision?	CO-4	L2
i.	Show any one method used for representing domain knowledge.	CO-5	L1
j.	Summarize the advantages of using expert system shells.	CO-5	L2
	SECTION-B		
2.	Analyze the Hill-Climbing algorithm and its core weaknesses.	CO-1	L4
3.	Identify the heuristic function that can be applied in the Travelling Salesman Problem.	CO-2	L3
4.	Explain the core principles an intelligent agent must use to act rationally under uncertainty with example.	CO-3	L5

5.	Compare and contrast 'learning from examples' with 'learning by taking advice' with its advantages and disadvantages.	CO-4	L4
6.	Critically access the limitations of using expert system shells in complex and dynamic domains.	CO-5	L5
	SECTION-C		
7.	Analyze the components of an intelligent agent and their interactions in a chess-playing AI.	CO-1	L4
8.	Evaluate the challenges of computing probabilities in large state spaces.	CO-3	L4
9.	Determine the historical significance and modern relevance of Winston's Learning Program. From a modern data-driven perspective, criticize the major weaknesses of Winston's symbolic approach.	CO-4	L5

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

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

DATA VISUALIZATION USING TABLEAU

Subject Code: BTAIML 505-20

M.Code: 92351 / 93181

Date of Examination: 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.	Define data visualization and its use for effective representation of information.	CO-1	L1
b.	Compare a dimension and a measure in Tableau.	CO-1	L2
c.	Explain about discrete data fields.	CO-1	L2
d.	Define filter shelf and its components .	CO-2	L1
e.	Compare INCLUDE LOD and EXCLUDE LOD using example.	CO-2	L2
f.	Explain the use of a parameter in Tableau.	CO-2	L2
g.	Define a bullet graph along with a suitable example.	CO-3	L1
h.	Explain the use of "waterfall chart" for data analysis.	CO-3	L2
i.	Define the meaning of a dashboard alert in Tableau.	CO-4	L1
j.	Explain the process of creating a trend line in a Tableau view.	CO-4	L2
	SECTION-B		
2.	Construct a calculated field in Tableau and apply steps to create Profit Ratio = Profit / Sales.	CO-1	L3
3.	Apply steps to create a dual-axis chart in Tableau using one useful scenario.	CO-2	L3
4.	Explain about various Visualization Graphs in detail.	CO-3	L5
5.	Analyze the effective use of colour in bar charts to present additional information.	CO-4	L4
6.	Evaluate the usefulness of a Gantt chart with an example.	CO-3	L5
	SECTION-C		
7.	Construct a Tableau worksheet that uses dimensions and measures to show sales performance by category.	CO-1	L3

8.	Choose a scatter plot versus a line chart to show correlation between two continuous variables.	CO-3	L3
9.	Explain the methodology of forecasting in Tableau and discuss the ways in which forecasts contribute to improved decision-making.	CO-4	L5

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

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

STATISTICAL COMPUTING TECHNIQUES USING R

Subject Code: BTES-501-20

M.Code: 92341/93936/93170

Date of Examination: 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.	What are vectors in R programming?	CO-1	L1
b.	Classify the types of data used in R programming.	CO-1	L2
c.	Show how to assign values to a variable in R with an example.	CO-2	L1
d.	Explain the role of read.csv() function.	CO-2	L2
e.	Define random number generation in statistical computing.	CO-3	L1
f.	Outline the role of scatterplots in identifying data relationships.	CO-3	L2
g.	Explain the purpose of using Bootstrap method in R.	CO-4	L1
h.	Demonstrate with an example how glm() function is used in R.	CO-4	L2
i.	Define outliers in the context of Exploratory Data Analysis.	CO-5	L1
j.	Compare S3 and Reference Classes in terms of object mutability.	CO-5	L2
	SECTION-B		
2.	Analyze basic R functions with example.	CO-1	L4
3.	Solve a problem using conditional statements "if a number is positive".	CO-2	L3
4.	The marks of 5 students in a test are: 20, 25, 30, 35, and 40. After calculating the variance and standard deviation, Explain whether the standard deviation reveals the uniformity or variation in students' performance. Explain whether the data indicates c.	CO-3	L5
5.	Compare Regularization and Tree based modelling methods in R.	CO-4	L4

6.	Determine the use of the dplyr package to work with large dataset.	CO-5	L5
	SECTION-C		
7.	Interpret the significance of R as a tool for handling large datasets in statistical analysis.	CO-1	L5
8.	Identify random number generation in R. Construct with R code how to generate random numbers from Uniform, Normal, Poisson distributions and represent them graphically using histograms.	CO-3	L3
9.	Determine the Bootstrap method to estimate standard error in R.	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 aabbaa 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 $L= \{a^n b^n c^m d^m \mid n \geq 1, m \geq 1\}$ 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 $E \rightarrow I$ $E \rightarrow E + E$ $E \rightarrow E * E$ $E \rightarrow (E)$ $I \rightarrow \varepsilon \mid 0 \mid 1 \mid \ldots \mid 9$ 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 (AIML), Semester- 6th

MACHINE LEARNING

Subject Code: BTCS 619-18

M.Code: 93666

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 a well-posed learning problem in machine learning.	CO-1	L1
b.	Explain the key issues involved in designing a learning system.	CO-1	L2
c.	What is data Pre-processing?	CO-2	L1
d.	Illustrate the concept of data normalization with example.	CO-2	L2
e.	What is regression in machine learning?	CO-3	L1
f.	Explain how the RMSE metric is used to evaluate regression performance.	CO-3	L2
g.	Define classification in machine learning with one example.	CO-4	L1
h.	Compare supervised learning and unsupervised learning.	CO-4	L2
i.	What are association rules in data mining?	CO-5	L1
j.	Illustrate the role of an activation function in neural networks.	CO-5	L2

SECTION-B			
2.	Apply the concept of well-posed learning problems to design a simple learning system for predicting student grades.	CO-1	L3
3.	Develop a Pre-processing pipeline including cleaning, integration, and transformation steps for a customer data set.	CO-2	L3
4.	Evaluate the performance of a multiple linear regression model using MAE and R^2 metrics and justify which one gives better insight.	CO-3	L5
5.	Analyze how decision trees and random forest differ in handling overfitting and accuracy.	CO-4	L4
6.	Justify the importance of fitness function during selection process in genetic algorithm.	CO-5	L5
SECTION-C			
7.	Construct a complete learning system starting from data Pre-processing to Model selection for predicting house prices with detailing each stage.	CO-2	L3
8.	Analyze the impact of polynomial degree on model accuracy and overfitting in polynomial regression with an example.	CO-3	L4
9.	Evaluate different classification techniques (SVM, K-NN, Decision Tree) for a disease prediction dataset and propose the best one with justification.	CO-4	L5

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Total No. of Questions: 09

B.Tech (AIML), Semester- 6th

COMPUTER NETWORKS

Subject Code: BTCS-504-18

M.Code: 93665

Date of Examination: 20-11-2025

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 any two services provided by Application Layer.	CO1	L1
b.	Summarize the term full duplex system.	CO1	L2
c.	List two advantages of fiber optic cable.	CO2	L1
d.	Outline one real-world scenario where mesh topology is suitable.	CO2	L2
e.	What is Time To Live(TTL) in an IP Packet?	CO3	L1
f.	Illustrate the need of IPv6.	CO3	L2

Q. No.	Question	Course Outcome	Bloom's Level
g.	Define the term data integrity and confidentiality.	CO4	L1
h.	Interpret the role of firewall in computer network.	CO4	L2
i.	List any four functions of TELNET.	CO5	L1
j.	Interpret the difference between Stop-and-Wait ARQ, Go-Back-N ARQ.	CO5	L2
	SECTION-B		
2.	Identify how encapsulation and de-encapsulation take place across OSI layers during data transmission.	CO1	L3
3.	Contrast wired LAN and wireless LAN to handle collision and access control.	CO2	L4
4.	Explain the role of DNS and DHCP in dynamic network environments.	CO3	L5
5.	Analyze the concept of Domain Name System and World Wide Web.	CO4	L4
6.	Compare symmetric-key cryptography and asymmetric-key cryptography.	CO5	L5
	SECTION-C		
7.	Distinguish between OSI Model and TCP/IP Model in detail.	CO1	L4
8.	Contrast Frequency Division Multiplexing (FDM), Time Division Multiplexing (TDM), and Wavelength Division Multiplexing (WDM) with neat diagrams.	CO3	L4
9.	Explain IP Assignment. Compare Static IP Assignment and Dynamic IP Assignment in detail.	CO4	L5

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

Roll No. | | | | | | | | | | | | | | Total No. of Pages: 2

Total No. of Questions: 09

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

BIG DATA ANALYTICS

Subject Code: BTDS 603-20

M.Code: 93675/93960

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.	Define name node and data node.	CO1	L1
b.	Illustrate any two importance of data sciences.	CO1	L2
c.	Outline the key challenges associated with big data.	CO1	L2
d.	Show the role of JobTracker in Hadoop Processing.	CO2	L1
e.	Compare Sqoop and Flume.	CO2	L2
f.	Illustrate any two advantages of using Hadoop for Big Data Processing.	CO2	L2
g.	What is support and confidence in association rule mining?	CO3	L1
h.	Explain any two applications of web mining.	CO3	L2

Q. No.	Question	Course Outcome	Bloom's Level
i.	What is the concept of operationalizing an analytics project?	CO4	L1
j.	Demonstrate any two common data visualization techniques.	CO4	L2
	SECTION-B		
2.	Apply the 5V's concepts in Big Data Analytics.	CO1	L3
3.	Distinguish between HDFS and Map-Reduce.	CO2	L4
4.	Explain the K-means clustering with its limitations.	CO3	L5
5.	Analyze the process of creating final deliverables in an analytics project.	CO4	L4
6.	Explain Linear and Logistic regression with the help of example.	CO3	L5
	SECTION-C		
7.	Examine data analytics and the life cycle of data analytics.	CO2	L4
8.	Apply the Apriori algorithm for association rule mining with the help of an example.	CO3	L3
9.	Explain the key steps in operationalizing a data analytics project from planning to deployment.	CO4	L5

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Total No. of Pages: 2

Total No. of Questions: 09

B. Tech. (CSE / IT/ ECE / AIML / AIDS), Semester: 6th

WIRELESS COMMUNICATION

Subject Code: BTEC-601-18

M. Code: 79373

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.	Questions	Course Outcomes	Bloom's Level
	SECTION-A		
1.	**Answer briefly:**		
a.	List any two advantages of cell splitting.	CO1	L1
b.	Explain the term frequency reuse.	CO1	L2
c.	What do you understand by the term fading?	CO2	L1
d.	Interpret the concept of Maximum Ratio Combining.	CO2	L2
e.	Define Packet Radio Protocol.	CO3	L1
f.	Summarize the role of SDMA in improving system capacity.	CO3	L2
g.	What is IS -136 Standard?	CO4	L1
h.	How the emerging technologies have changed the communication system?	CO4	L2
i.	Illustrate any two technical aspects of Advanced Mobile Phone System.	CO4	L1
j.	Compare and contrast the differences between 4G and 5G technologies.	CO5	L2

	SECTION-B		
2.	Identify the need for handoff in cellular systems and describe the two types of handoff based on signal strength and carrier-to-interference (C/I) ratio.	CO1	L3
3.	Distinguish between Flat Fading and Frequency Selective Fading, highlighting their key characteristics and impact on signal transmission.	CO2	L4
4.	Compare the working principles of Time Division Multiple Access (TDMA) and Frequency Division Multiple Access (FDMA) along with their technical parameters.	CO3	L5
5.	Classify the key components of CDMA digital cellular standard (IS-95) and describe its frequency and channel specification in detail.	CO4	L4
6.	Explain the ZigBee protocol stack by constructing its architecture and describe the function of each layer. Discuss how effectively these layers work together to support reliable wireless communication.	CO5	L5
	SECTION-C		
7.	Analyze the various signal combining techniques used in wireless communication and explain how each technique improves signal quality, with suitable diagram.	CO2	L4
8.	Classify the various multiple access techniques used in wireless communication and describe the basic principle of each.	CO3	L4
9.	Assess the evolution of digital cellular land mobile systems and explain how they address the limitations of AMPS standards.	CO4	L5

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Total No. of Questions: 09

B. Tech (AIML), Semester- 6th

RECOMMENDER SYSTEM

Subject Code: BTAIML-605-20

M. Code: 93679

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.	Define recommender system and its basic purpose.	CO1	L1
b.	Explain how convex optimization assists in recommender system design.	CO1	L2
c.	List the key components of a content-based recommender system.	CO2	L1
d.	Illustrate the long-tail principle with an example.	CO2	L2
e.	What is the optimization objective in collaborative filtering?	CO3	L1
f.	Demonstrate how temporal models enhance collaborative filtering accuracy.	CO3	L2
g.	Recall what contextual information refers to in context-aware recommender systems.	CO4	L1

Q. No.	Question	Course Outcome	Blo Le
h.	Compare reinforcement learning and active learning in recommender system.	CO4	L
i.	Name various hybrid recommender system strategies.	CO5	L
j.	Summarize the advantages of incorporating dynamic models in recommender system.	CO5	L
	SECTION-B		
2.	Apply Bayes classifiers to explain a movie recommendation model and analyze it's working.	CO1	L
3.	Utilize feature selection techniques to construct a domain-specific recommender for books and interpret its outcome.	CO2	L
4.	Evaluate different neighbourhood computation methods in user-based and item-based collaborative filtering (CF), and propose which is most efficient.	CO3	L
5.	Build a contextual model using reinforcement learning for a dynamic Recommender system scenario.	CO4	L
6.	Determine a hybrid framework combining collaborative filtering (CF) and content-based recommender system.	CO5	L
	SECTION-C		
7.	Analyze a complete Recommender System pipeline using both data-mining and feature-based approaches, highlighting challenges in scalability and personalization.	CO2	
8.	Examine mathematical optimization techniques for collaborative filtering (CF) recommender systems.	CO3	
9.	Design a context-aware recommender system integrating reinforcement learning and dynamic adaptation.	CO4	

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

B.Tech (AIML), Semester-7th

NETWORK SECURITY APPLICATIONS USING AI

Subject Code: BTAIML705-20

M.Code: 93994

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.	What are the two strengths of SVM in cyber defense?	CO-1	L1
b.	Illustrate how random forest improves classification accuracy.	CO-1	L2
c.	What are the common types of outliers found in fraud datasets?	CO-2	L1
d.	Explain the significance of feature scaling in preparing fraud datasets.	CO-2	L2
e.	Name popular datasets used for spam detection.	CO-3	L1
f.	Contrast precision and recall in the context of spam filtering.	CO-3	L2
g.	List network-based and host-based IDS to their primary functions.	CO-4	L1
h.	Interpret the gaps in traditional IDS detection methods.	CO-4	L2
i.	Define the benefits of ensemble learning in IDS.	CO-5	L1
j.	Compare shallow and deep learning models applied to IDS datasets.	CO-5	L2
	SECTION-B		
2.	Identify the advantages of random forest compared to a single decision tree.	CO-1	L3
3.	Compare efficiency of Support Vector Machines and neural networks for fraud detection.	CO-2	L4
4.	Explain how cross-validation enhances the robustness of spam detection models.	CO-3	L5
5.	Identify the impact of dataset imbalance on spam detection results.	CO-4	L3
6.	Recommend evaluation metrics best suited for deep learning IDS models and justify your choices.	CO-5	L5

SECTION-C			
7.	Identify which classifier (SVM or Random Forest) is better suited for handling imbalanced network traffic datasets and compare their handling of class imbalance, decision boundaries, and performance in cybersecurity applications.	CO-1	L3
8.	Apply TF–IDF vectorization for representing text data in a spam detection system and how TF–IDF weighting improves the effectiveness and accuracy of spam classification compared to simple frequency-based text representations with suitable examples.	CO-3	L3
9.	Explain the workflow for pre-processing IDS log data before training ML models and interpret the significance of each step in improving model accuracy, reducing noise, and ensuring effective network attack detection.	CO-4	L5

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Total No. of Questions: 09

B.Tech (AIML), Semester 7TH

APPLIED INTELLIGENCE

SUBJECT CODE: BTAIML 709-20

M.CODE: -93989

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 Level
	SECTION-A		
1.	Answer briefly:		
a.	Identify different types of random variables with examples.	CO-1	L1
b.	Explain how random variables differ from deterministic variables?	CO-1	L2
c.	What is the meaning of capability need in system planning?	CO-2	L1
d.	Summarize the sequence of activities in the systems process.	CO-2	L2
e.	How descriptive statistics help summarize data.	CO-3	L1
f.	Explain control systems enable coordination in CPS?	CO-3	L2
g.	Name the connectives used in logical expressions.	CO-4	L1
h.	Compare backward chaining and forward chaining inference strategies.	CO-4	L2
i.	Name common activation functions used in neural networks.	CO-5	L1
j.	Contrast how Tensor Flow supports in deep learning model development?	CO-5	L2
	SECTION-B		
2.	Contrast the components of a mixture model and their contributions.	CO-1	L4
3.	Discuss the importance of sensor networks.	CO-2	L3
4.	Explore how reasoning mechanisms can fail due to incomplete data?	CO-3	L5

5.	Inspect how inconsistencies arise in knowledge representation systems?	CO-4	L4
6.	Justify the need for frameworks like Tensor Flow in industrial-scale deep learning	CO-5	L5
	SECTION-C		
7.	Categorize different stochastic processes based on their dependency structure.	CO-1	L4
8.	Compare types of reasoning (deductive, inductive, abductive) used in automation.	CO-3	L4
9.	Deduct features required in a logic-based reasoning agent for automation.	CO-4	L5

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

B.Tech (AIML), Semester-7th

DEEP LEARNING

Subject Code: BTCS 704-18

M.Code: 93998

Date of Examination: 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 Bayesian Statistic.	CO-1	L1
b.	Interpret the role of estimators in ML.	CO-1	L2
c.	What is a hidden unit in neural networks?	CO-2	L1
d.	Illustrate adversarial training with an example.	CO-2	L2
e.	List two types of pooling methods.	CO-3	L1
f.	Summarize the role of stride and padding.	CO-3	L2
g.	What is an echo state network?	CO-4	L1
h.	Explain recursive neural networks with example.	CO-4	L2
i.	Define energy function in Boltzmann machines.	CO-5	L1
j.	Compare Restricted Boltzmann Machine and Deep Boltzmann Machine.	CO-5	L2
	SECTION-B		
2.	Distinguish between bias and variance errors with the help of graphs.	CO-1	L4
3.	Apply backpropagation algorithm with the help of an example in Data Mining.	CO-2	L3
4.	Evaluate convolutional neural networks vs. fully connected networks for image recognition tasks to analyse the performance.	CO-3	L5
5.	Demonstrate how echo state networks work for time-series prediction.	CO-4	L3

6.	Explain the Deep Generative model and its various components.	CO-5	L5
	SECTION-C		
7.	Analyze supervised and unsupervised learning by breaking down their advantages and limitations for the different Machine learning/deep learning tasks.	CO-1	L4
8.	Apply CNN architecture to explain the different layers for recognition of edges in image. Identify the differences between shallow CNNs and deep CNNs with respect to feature extraction.	CO-3	L3
9.	Explain the importance of attention mechanisms in sequence-to-sequence learning and the role of RNNs in NLP.	CO-4	L5

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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: 06-11-2025

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.	A network has 4 routers with the following link costs: * R1–R2 = 2 * R1–R3 = 5 * R2–R3 = 1 * R2–R4 = 2 * R3–R4 = 3 Given the same topology above, calculate the **OSPF cost** from R1 to R4.	CO-2	L5
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 **Total No. of Questions: 09**

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

COMPILER DESIGN

Subject Code: BTCS601-18

M.Code: 93988

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.	List the phases of a compiler.	CO-1	L1
b.	Differentiate between compiler and interpreter.	CO-1	L2
c.	What is the role of a parser?	CO-2	L1
d.	State any two limitations of LL(1) parser.	CO-2	L2
e.	Explain three-address code.	CO-3	L1
f.	State the importance of symbol table in code generation.	CO-3	L2
g.	What is storage organization?	CO-4	L1
h.	Explain purpose of runtime stack.	CO-4	L2
i.	Define code optimization.	CO-5	L1
j.	Explain global data flow analysis.	CO-5	L2
	SECTION-B		
2.	Illustrate lexical errors with suitable examples.	CO-1	L3
3.	Construct FIRST and FOLLOW sets for a given grammar. $E \rightarrow T\ E'$ $E' \rightarrow +\ T\ E' \mid \varepsilon$ $T \rightarrow F\ T'$ $T' \rightarrow *\ F\ T' \mid \varepsilon$ $F \rightarrow (\ E\ ) \mid id$	CO-2	L4

4.	Design syntax-directed definitions for type checking in arithmetic expressions.	CO-3	L6
5.	Analyze advantages of stack-based storage allocation.	CO-4	L4
6.	Evaluate the effectiveness of DAG-based optimization for a sequence of arithmetic expressions.	CO-5	L5
	SECTION-C		
7.	Analyze advantages of using Lex tool in lexical analysis with the help of example.	CO-1	L4
8.	Illustrate type checking with suitable example.	CO-3	L3
9.	Evaluate the impact of different storage organizations on the efficiency of generated code.	CO-4	L5

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