

Roll No.

Total No. of Pages: 2

Total No. of Questions: 09

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

Subject Code: 25C1EMU-101

M.Code:

Date of Examination: 12-12-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define D'Alembert's Ratio Test.	CO-1	L1
b.	Interpret whether the sequence $\{a_n\}$, where $a_n = \frac{2n-1}{(n+1)^2}$ is convergent or divergent.	CO-1	L2
c.	Explain Maclaurin's Theorem in one variable.	CO-1	L2
d.	Define Beta and Gamma function with their examples.	CO-2	L1
e.	Show that: $\int_0^{\infty} e^{-x^2} dx = \frac{\sqrt{\pi}}{2}$	CO-2	L2
f.	Show that: $\beta(m, n) = \beta(m, n+1) + \beta(m+1, n)$.	CO-2	L2
g.	Find stationary points of the function: $f(x, y) = x^2 + y^2 + 6x + 12$	CO-3	L1
h.	Explain the conditions for maxima and minima of a function of two variables.	CO-3	L2
i.	Find the value of: $\int_0^3 \int_0^1 (x^2 + 3y^2) dy dx$	CO-4	L1
j.	Infer the value of the integral: $\int_0^2 \int_1^2 \int_0^{yz} xyz dx dy dz$	CO-4	L2
SECTION-B			
2.	Examine the convergence/divergence of the series:	CO-1	L4

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

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j.	Find eigen values and eigen vectors $\begin{bmatrix} 1 & -2 \\ -5 & 4 \end{bmatrix}$	CO5	L1
SECTION-B			
2.	Determine the system $x + y + z = 3$ $3x - 9y + 2z = -4$ $5x - 3y + 4z = 6$ Is consistent and evaluate solution if the system is consistent.	CO5	L5
3.	Solve the approximate value of $\cos 32^\circ$ by using Taylor's series.	CO1	L3
4.	Simplify $\int_0^1 \int_{4y}^4 e^{x^2} dx dy$ by changing the order of integration.	CO3	L4
5.	Test the absolutely convergence of the series $\sum_{n=1}^{\infty} \frac{\cos n \pi}{n\sqrt{n}}$	CO4	L4
SECTION-C			
6.	Solve $\int_0^{\infty} \int_0^x x e^{-\frac{x^2}{y}} dy dx$	CO3	L3
7.	Prove that $\int_0^{\frac{\pi}{2}} \sqrt{\tan x} dx = \frac{\pi}{\sqrt{2}}$	CO2	L5
8.	What do you mean by Bounded sequence and Unbounded sequence? Also, analyse that the sequence $\left\{ \left(1 + \frac{1}{n}\right)^n \right\}$ is bounded.	CO4	L1, L3
9.	Simplify the modal matrix for matrix $A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 2 & 1 \\ 1 & -1 & 4 \end{bmatrix}$	CO5	L4

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

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

CHEMISTRY-I

Subject Code: BTCH101-18

M.Code: 75343

Date of Examination: 02-12-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What are chromophores? Give example.	CO3	L1
b.	Outline dry corrosion of metals.	CO2	L2
c.	Recall the term penetration of orbitals.	CO4	L1
d.	Why Electron gain enthalpy of noble gases comes out to be positive?	CO4	L1
e.	Show dipole-dipole interactions through example.	CO1	L2
f.	List differences between enantiomers and diastereomers.	CO6	L1
g.	Show Anti-Markovnikoff addition of water in alkenes.	CO5	L2
h.	Label R and S configuration to the following: <div style="text-align: center;">$\begin{array}{c} \text{CH}_3\text{Cl} \\ \\ \text{H}_3\text{CH}_2\text{C} - \text{C} - \text{CHO} \\ \\ \text{Br} \end{array}$</div>	CO6	L1
i.	Summarize about optical activity of organic compounds.	CO3	L2
j.	Classify and name various types of organic reactions.	CO5	L2
SECTION-B			
2.	Assess Crystal field splitting in tetrahedral complexes through proper diagram. Also calculate CFSE for d^4 and d^6 configurations for tetrahedral complexes.	CO1	L5
3.	(a) Solve the Nernst equation for the electrochemical cell. Also give its various applications.		

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

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

CHEMISTRY-I

Subject Code: BTCH101-23

M.Code: 93800

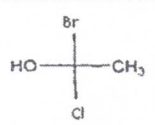
Date of Examination: 02-12-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Why is TMS used as an internal standard in NMR spectroscopy.	CO3	L1
b.	Outline dry corrosion of metals.	CO2	L2
c.	Recall effective nuclear charge term.	CO4	L1
d.	Why halogens have highest electron affinity in the periodic table?	CO4	L1
e.	How atomic radii varies along the period in the periodic table?	CO1	L1
f.	Outline position isomerism with an example.	CO6	L1
g.	Infer about electrophiles through examples.	CO5	L2
h.	Label R and S configuration to the following: 	CO6	L1
i.	Illustrate the terms: Bathochromic shift and Hypsochromic shift.	CO3	L2
j.	Demonstrate free radical substitution reaction in alkanes.	CO5	L2
SECTION-B			
2.	Construct the molecular orbital diagram for N ₂ molecule and by making use of MOT compare (a) stability (b) Bond order (c) bond length (d) magnetic behavior of N ² , N ²⁺ and N ²⁻ species.	CO1	L5

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

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

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Compare active and passive elements.	CO1	L2
b.	Explain superposition's theorem.	CO1	L2
c.	What is the effect of frequency on inductive reactance?	CO2	L1
d.	Compare DC and AC.	CO2	L2
e.	Define magnetic materials and provide examples.	CO3	L1
f.	Illustrate the significance of torque-slip characteristics in case of an electrical machine.	CO3	L2
g.	What is the difference between wire & cable?	CO4	L1
h.	List the properties of ideal fuse wire.	CO4	L1
i.	What is the importance of power factor?	CO2	L1
j.	Define voltage regulation for a transformer.	CO3	L1
SECTION-B			
2.	Examine the transient analysis of first order RL series circuit. Also sketch the graphical representation of RL series circuit.	CO1	L4
3.	Solve for current through $10\ \Omega$ using Norton's theorem.	CO1	L3

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

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Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech. (All Branches), (Sem.-1, 2)
PROGRAMMING FOR PROBLEM SOLVING
 Subject Code: BTPS101-18
 M.Code: 75346/93803
 Date of Examination: 05-12-2025

Max. Marks: 60

Time: 3 Hrs.

INSTRUCTIONS TO CANDIDATES:

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

SECTION-C			
6.	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

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

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

ENGINEERING PHYSICS

Subject Code: BTPPH101-23

M.Code: 93794

Date of Examination: 18-11-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define a Unit Cell.	CO1	L1
b.	What do you mean by extrinsic semiconductor?	CO2	L1
c.	List two unusual properties of nanomaterials.	CO3	L1
d.	Find the gradient of $1/r^2$ where $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$.	CO4	L1
e.	Explain the physical significance of a wave function.	CO5	L2
f.	What is Holography?	CO6	L1
g.	Illustrate the properties of X-rays.	CO1	L2
h.	Explain Magnetic anisotropy.	CO3	L2
i.	Compare the condition for the vector F to be solenoidal and vector F to be irrotational.	CO4	L2
j.	What is Uncertainty Principle?	CO5	L1
SECTION-B			
2.	Identify the wavelength of X-ray using Bragg's Spectrometer. Also find the minimum wavelength of continuous X-ray emitted from an X-Ray tube with operating voltage of 24kV.	CO1	L3
3.	Examine the function of Zener diode as a voltage regulator.	CO2	L4
4.	Utilize the principles of superconductivity to compare the behavior of Type-I and Type-II superconductors and explain their soft and hard nature.	CO3	L3
5.	Explain the construction and working of Ruby laser with the help of energy level diagram. Also explain spiking in ruby laser.	CO6	L5

SECTION-C

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

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Roll No.

Total No. of Questions: 09

Total No. of Pages:04

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

ENGLISH & PROFESSIONAL COMMUNICATION

Subject Code: 25C1EPU-101

M.Code:

Date of Examination: 23-12-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Select the sentence that contains a cliché: i. Actions speak louder than words. ii. Consistent effort often outweighs empty promises.	CO-1	L1
b.	Interpret the mistakes in the given abbreviations and rewrite correctly: "CIA-Central Intelligence Agency" , "LAN- Live Area Network"	CO-1	L2
c.	Find and fix the noun-pronoun disagreement in the given sentences: i. The mangoes are very sour. Where did you buy it? ii. The army has reached its destination.	CO-2	L1
d.	Interpret and fix the misplaced modifiers in the given sentences: i. My brother only has two children. ii. Reading a book frequently will change the whole course of a man's life.	CO-2	L2
e.	List any two features of a precise writing.	CO-3	L1
f.	"Effective writing is always clear, engaging, and purposeful." Interpret the reason.	CO-3	L2
g.	Outline the ways by which the regular practice of reading comprehension exercises strengthen critical thinking abilities.	CO-4	L2

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

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

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

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: 2

Total No. of Questions: 09

B.Tech (ECE), (Sem-1,2)

SEMICONDUCTOR & OPTOELECTRONICS PHYSICS

Subject Code: BTPEH105-18

M.Code: 75363

Date of Examination: 18-11-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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

Q.No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Summarize important features of Quantum theory.	CO1	L2
b.	Define Fermi energy.	CO1	L1
c.	Explain Charge carrier generation and recombination.	CO2	L2
d.	Define Knee Voltage.	CO2	L1
e.	What is photovoltaic effect?	CO3	L1
f.	Illustrate the basic principle of LED.	CO3	L2
g.	List two application of Hall effect.	CO4	L1
h.	Find the wavelength of semiconductor laser with energy band gap 1.44 Angstrom.	CO4	L1
i.	Classify Brillouin Zone.	CO1	L2
j.	List the properties of semiconductor.	CO2	L2
SECTION-B			
2.	Explain KP model along with its important conclusions.	CO1	L5
3.	Distinguish between p-type and n-type semiconductors along with Fermi energy.	CO2	L4
4.	Apply the concept of photo-detection to construct and explain the principle, working, and disadvantages of a PIN-Diode.	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 effective mass relationship of an electron.	CO1	L4
7.	Apply the concept of Fermi level to illustrate its variation with temperature in intrinsic and extrinsic semiconductors.	CO2	L3

8.	a) Classify Radiative and non-radiative recombination mechanisms in semiconductors. b) Analyze how population inversion enables laser action.	CO3	L4
9.	Explain Hall effect and derive the expression for Hall coefficient.	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.

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

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.

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

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.

SECTION-B			
2.	Solve $\frac{dy}{dx} = \log(\log(x + y))y, y(0) = 2$ at $x = 0.2$ and 0.4 with $h = 0.2$ by Euler's Modified method.	CO2	L3
3.	Determine the value of y by using the Runge - Kutta fourth order method, when $x = 1$, given that $y = 1$ when $x = 0$ and $\frac{dy}{dx} = x + y^2$.	CO4	L5
4.	Solve $(5x^3 + 12x^2 + 6y^2)dx + 6xydy = 0$.	CO1	L3
5.	Solve the integral $\int_0^2 \frac{1}{1+x^2} dx$ by using Trapezoidal Rule with $h = 0.25$.	CO3	L3
SECTION-C			
6.	Examine the symmetry of data to approximate the value of $y(30)$ using Gauss's forward formula. Given $y(21)=18.4708, y(25)=17.8144, y(29)= 17.1070, y(33)=16.3432$ and $y(37)=15.5154$.	CO3	L4
7.	Apply the method of variation of parameters to solve $y'' - y = \frac{2}{1+e^x}$.	CO1	L3
8.	Determine an approximate value of y using modified Euler's method when $x = 0.3$, given that $\frac{dy}{dx} = x + y$ and $y = 1$.	CO4	L5
9.	Solve the partial differential equations $(D^2 - DD' - 2D'^2)z = (y - 1)e^x$.	CO2	L3

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

3.	Analyze the Fourier Series of the function : $f(x) = \cos x , x \in (-\pi, \pi)$	CO-2	L4												
4.	Interpret the Z transform of the sequence : $x[k] = (k + 2)^2$	CO-3	L5												
5.	The mean yearly salary of employees of a company was Rs. 20,000, the mean yearly salary of male and female employees were Rs. 20,800 and Rs. 16,800 respectively. Solve to find out the percentage of males and females employed by the company.	CO-4	L5												
6.	Identify the second degree curve for the data: <table border="1" style="margin: 10px auto;"> <tbody> <tr> <td>X</td> <td>0</td> <td>5</td> <td>10</td> <td>15</td> </tr> <tr> <td>Y</td> <td>12</td> <td>15</td> <td>17</td> <td>22</td> </tr> </tbody> </table>	X	0	5	10	15	Y	12	15	17	22	CO-6	L3		
X	0	5	10	15											
Y	12	15	17	22											
SECTION-C															
7.	Solve the differential equation using Laplace Transformation. $y''' + 2y'' - y' - 2y = 0,$ $y(0) = y'(0) = 0, y''(0) = 6$	CO-1	L3												
8.	Determine the mean and variance after verifying for probability density function: $f(x) = \begin{cases} 2e^{-2x}, & x > 0 \\ 0, & \text{otherwise} \end{cases}$	CO-4	L5												
9.	(a) Estimate the frequency by fitting Poisson distribution to the data: <table border="1" style="margin: 10px auto;"> <tbody> <tr> <td>X</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>f</td> <td>122</td> <td>60</td> <td>15</td> <td>2</td> <td>1</td> </tr> </tbody> </table> (b) In normal distribution, 12% of the items are under 30 and 85% are under 60. Determine the mean and standard deviation of the distribution.	X	0	1	2	3	4	f	122	60	15	2	1	CO-5	L5
X	0	1	2	3	4										
f	122	60	15	2	1										

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Total No. of Pages: 02

Total No. of Questions:09

B.Tech (CSE/AIIML/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:

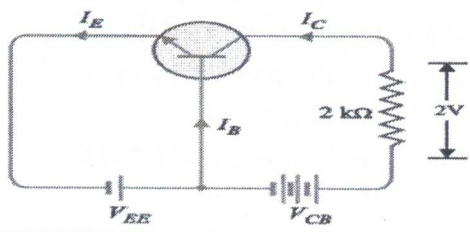
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

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

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.

4.	<p>In a common base connection, $\alpha = 0.95$. The voltage drop across $2\text{ k}\Omega$ resistance which is connected in the collector is 2V. Determine the base current, emitter current and collector current.</p> 	CO-3	L5
5.	Define etching. Analyze how wet etching is different from dry etching.	CO-4	L4
6.	The NPN transistor is connected in common base configuration, when the emitter current of a transistor 1.2 mA , its collector current changes to 0.9 mA . Determine the base current and its circuit gain α .	CO-3	L5
SECTION-C			
7.	Compare and interpret the performance of half wave, centre tapped full wave in terms of circuit diagram, operation, output waveform, Peak Inverse Voltage and efficiency.	CO-2	L5
8.	Examine how the operation of a Common Base transistor differs in diverse regions, and justify their applications in amplifier and switch circuits.	CO-3	L4
9.	Evaluate step-by-step mechanism of Chemical Vapour Deposition (CVD) and differentiate it from Physical Vapour Deposition (PVD) based on deposition environment.	CO-4	L5

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Total No. of Pages:02

Total No. of Questions: 09

B. Tech (ECE), Semester 3rd
DIGITAL SYSTEM DESIGN

Subject Code: BTEC302-18

M. Code: 76445

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 Excess-3 Code?	CO-1	L1
b.	Convert the given Boolean expression to canonical SOP form: $F = A + BE + AC'D$	CO-1	L2
c.	Define 2-bit Magnitude Comparator. Draw it's truth table.	CO-2	L1
d.	How the signed numbers can be represented in Digital?	CO-2	L2
e.	What is S-R Flip-Flop? Draw truth table and excitation table for the same.	CO-3	L1
f.	Which and how many flip-flops are needed to design a 4-bit shift register?	CO-3	L2
g.	What is the need of A to D and D to A converters?	CO-4	L1
h.	Explain the importance of libraries and packages in VHDL design.	CO-5	L2
i.	Define entity and architecture.	CO-5	L1
j.	Compare between Data flow and structural modelling in VHDL.	CO-5	L2
SECTION-B			
2.	Make use of K-map technique to Reduce the Boolean function given below and implement its circuit using logic gates. $F(W, X, Y, Z) = \sum m(0,1,4,8,9,10) + d(2,11)$.	CO-1	L3
3.	Implement Full Adder and Full Subtractor using Decoder and OR gates.	CO-2	L3
4.	Design a MOD-8 Synchronous Counter using T-type Flip-Flops.	CO-3	L6
5.	Explain TTL NAND gate with the help of circuit diagram. Discuss its Propagation delay and Power dissipation.	CO-4	L4

6.	Develop a VHDL code for a 4:1 Multiplexer using dataflow modelling.	CO-5	L4
SECTION-C			
7.	a) Examine De- Morgan's theorems and demonstrate their use in simplifying Boolean expressions with an example. b) Design Octal to Binary Encoder using Logic Gates.	CO-1	L4
8.	a) Compare Moore and Mealy finite state machines with suitable examples. Which one has faster response and why? b) Convert S-R flip-Flop to J-K Flip-flop using Excitation Tables.	CO-3	L4
9.	a) Implement 3-bit Binary to Gray Code Converter using PLA. b) Explain the working of Flash type A to D Converter using block diagram.	CO-4	L5

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Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (ECE), Semester-3rd
ELECTROMAGNETIC WAVES

Subject Code: BTEC-303-18

M.Code: 76446

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.	What is an S-parameter?	CO-1	L1
b.	Compare between lossless & low loss transmission line	CO-1	L2
c.	Write Maxwell's equation for magnetic fields.	CO-2	L1
d.	Explain difference between magnetic flux density B and magnetic field intensity H.	CO-2	L2
e.	Define uniform plane wave.	CO-3	L1
f.	Illustrate types of polarization.	CO-3	L2
g.	How wave is incident normally on perfect dielectric medium?	CO-4	L1
h.	Explain law of reflection.	CO-4	L2
i.	How TEM mode does not exist in a waveguide?	CO-5	L1
j.	Compare cut off wavelength & guided wavelength.	CO-5	L2
SECTION-B			
2.	A 75 Ω transmission line is connected to a 100 Ω load. Evaluate its reflection coefficient and VSWR.	CO-1	L4
3.	Analyze the physical and mathematical implications of zero divergence and zero curl in a vector field.	CO-2	L4
4.	Explain the definite ratio in the amplitudes of E & H in case of Electromagnetic waves.	CO-3	L5
5.	Examine the concept of total internal reflection.	CO-4	L4
6.	A rectangular Waveguide has dimensions 3.5 * 1.5 cm operates at 10 GHz. Compute Cut-off frequency, Cut-off wavelength, Guided wavelength & phase constant in TE ₁₀ mode.	CO-5	L5

SECTION-C			
7.	Examine voltage & current equations of Transmission line when load end is terminated with any impedance.	CO-1	L4
8.	Examine how to obtain the wave equation for the electric & magnetic field in a conducting medium from Maxwell's curl equations.	CO-3	L4
9.	Explain normal incidence expressions for dielectric medium.	CO-4	L5

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Roll No.

Total No. of Pages:02

Total No. of Questions: 09

B.Tech (ECE), Semester-3rd

NETWORK THEORY

Subject Code: BTEC-304-18

M.Code: 76447

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.	What is meant by Active and Passive elements?	CO-1	L1
b.	Given that the resistors R_a , R_b and R_c are connected electrically in star configuration. Write the equations for resistors in equivalent delta form.	CO-1	L2
c.	What is the Laplace Transform of the unit step signal $u(t)$?	CO-2	L1
d.	Explain transient of a network in time domain.	CO-2	L2
e.	Write the voltage and current equations for ABCD parameters.	CO-3	L1
f.	Demonstrate the equivalent circuit diagram of Z parameters.	CO-3	L2
g.	Find the Laplace transform of the given function $x(t) = u(t) - u(t-2)$	CO-4	L1
h.	Explain the properties for a polynomial $P(S)$ to be Hurwitz.	CO-4	L2
i.	Write applications of positive real functions.	CO-5	L1
j.	Explain how the Foster first form can be obtained from the given $Z(S)$ $Z(S) = \frac{4(S)(S^2+4)}{(S^2+1)(S^2+16)}$	CO-5	L2
SECTION-B			
2.	Analyze maximum power transfer theorem for dc circuits and derive the relation to calculate maximum power.	CO-1	L3
3.	Analyse the step response of RL series circuit.	CO-2	L4
4.	Determine h parameters of a two port network and draw its equivalent h-model.	CO-3	L5
5.	Analyze the polynomial is hurwitz or not $P(S) = S^8 + S^7 + S^6 + 2S^5 + 4S^3 + S^2 + S + 1$	CO-4	L4

6.	Evaluate Initial Value, Final Value theorem. Also Find the Initial value for the function. $f(t) = e^{-t} (\sin 3t + \cos 5t)$	CO-5	L5
SECTION-C			
7.	Analyse the current in 5Ω resistor for the circuit shown in figure given below using Norton's Theorem.	CO-1	L4
8.	Explain passive filters with suitable diagrams. Also give properties of the filters.	CO-3	L5
9.	Determine Foster-I,II and Cauer I,II form for an impedance function given by $Z(S)$, Realize the network as well. $Z(S) = \frac{8(S^2+1)(S^2+3)}{S(S^2+2)(S^2+4)}$	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 (ECE), Semester-3rd

FOUNDATIONAL COURSE IN HUMANITIES (PHILOSOPHY)

Subject Code: HSMC102-18

M.Code: 77082

Date of Examination: 15-12-2025

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 Socratic method of knowledge?	CO-1	L1
b.	Explain the difference between orthodox (āstika) and heterodox (nāstika) schools.	CO-1	L2
c.	Name the two schools of Mīmāṃsā.	CO-2	L1
d.	Interpret Sikshavalli briefly.	CO-2	L2
e.	List any two ways in which science contributes to invention.	CO-3	L1
f.	Compare the transcendental self with the social self.	CO-3	L2
g.	Identify one moral value taught in your family or community.	CO-4	L1
h.	Interpret the meaning of honesty as an ethical value.	CO-4	L2
i.	List any two Tantrayukti tools mentioned by Vyasa.	CO-5	L1
j.	Explain how Yoga ensures clarity in scientific writing.	CO-5	L2
SECTION-B			
2.	Analyze how the Nasadiya Sukta presents uncertainty about the origin of the universe.	CO-1	L4
3.	Apply Foucault's concept of societal surveillance to a real-world scenario, such as social media monitoring.	CO-2	L3
4.	Judge whether the current relationship between society, polity, and nature is balanced or not.	CO-3	L5
5.	Apply the idea of ethical codes to solve a conflict in school or workplace.	CO-4	L3

6.	Conclude Purvapaksha and Ekanta.	CO-5	L5
SECTION-C			
7.	Analyze knowledge basis as the sources of Vidya according to Indian Systems.	CO-1	L4
8.	Break down the role of scientific research and technological innovation in shaping inventions.	CO-3	L4
9.	Determine whether it is more important to follow your own morals or rules made by the society.	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.

3.	Simplify $Z\{\cos(n+1)\theta\}$.	CO3	L4												
4.	Marks obtained by a number of students are assumed to be normal distributed with mean 50 and variance 36. If 5 students are taken at random, Determine the probability that at least two of them will have marks over 65. Given that $\int_0^{2.5} \phi(z) dz = 0.4938$, Z is $N(0, 1)$.	CO5	L5												
5.	Using the Z -transform, simplify : $u_{n+2} + 6u_{n+1} + 9u_n = 2^n$ with $u_0 = 0, u_1 = 0$.	CO3	L4												
6.	Solve $\int_0^\infty e^{-2t} \cos 2t dt$ using Laplace transformation.	CO4	L3												
SECTION-C															
7.	Simplify y from the differential equation $y'' - 3y' + 2y = e^{-t}$ With $y(0) = 1$ and $y'(0) = 0$ using transformations.	CO1	L4												
8.	Measure a binomial distribution to the following data: <table border="1" style="margin-left: 20px;"> <tr> <td>X</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>f</td> <td>30</td> <td>62</td> <td>46</td> <td>10</td> <td>2</td> </tr> </table>	X	0	1	2	3	4	f	30	62	46	10	2	CO5	L5
X	0	1	2	3	4										
f	30	62	46	10	2										
9.	Interpret e^x as a Fourier Series in the interval $[0, 2\pi]$.	CO2	L5												

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Roll No.

Total No. of Pages: 01

Total No. of Questions: 08

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

Subject Code: MTCS 304-18

M.Code: 76511

Date of Examination: 18-11-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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

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

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3.	Develop depth first search and breath first search algorithms using suitable examples.	CO-2	L3
4.	Evaluate a heap in data structure, give its applications.	CO-3	L5
5.	Explain the concept of hashing along with the various techniques used for hashing.	CO-4	L5
6.	Interpret max heap and min heap in data structure along with an example.	CO-3	L5
SECTION-C			
7.	Develop max heap from the following sequence of nodes. 4,12,9,15,22,25,68,48,39,10,52	CO-4	L3
8.	Evaluate +, -, *, 2, 2, /, 16, 8, 5 using stacks in data structure.	CO-1	L5
9.	Analyze the design of AVL tree by inserting nodes one by one. Show all the steps and rotation. 8,9,10,2,1,5,3,6,4,7,1,12	CO-2	L4

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Total No. of Pages: 2

Total No. of Questions: 09

B.Tech (ECE), Semester- 4th

SIGNALS AND SYSTEMS

Subject Code: BTEC-403-18

M. Code: 77568

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 is the simplest way to check the linearity of system?	CO-1	L1
b.	Distinguish between energy and power signal.	CO-1	L2
c.	List out the methods of computing Convolution Sum.	CO-2	L1
d.	Explain recursive and Non recursive systems.	CO-2	L2
e.	A analog signal is expressed by $x(t) = 3\cos 50\pi t + 10\sin 300\pi t$, Calculate Nyquist rate for the signal.	CO-3	L1
f.	Outline Dirichlet's Conditions for Fourier Series.	CO-3	L2
g.	Define ROC and explain its significance.	CO-4	L1
h.	Show the Z transform of $x(n) = \{1, 2, 5, 7, 9, 3\}$.	CO-4	L2
i.	Define probability of random events.	CO-5	L1
j.	Explain mean, median and standard deviation.	CO-5	L2
SECTION-B			
2.	Analyze the following system, whether it is linear, static, shift invariant and Causal? $y[n] = nx(n)+5$	CO-1	L4
3.	Determine the Homogeneous Solution of second order difference equation $y(n)-3y(n-1)-4y(n-2) = x(n)$	CO-2	L5
4.	Solve the Fourier transform of a rectangular pulse of duration 1 sec and having magnitude 10 volts.	CO-3	L3
5.	Elaborate any four properties of DTFT.	CO-4	L6
6.	Classify CDF and PDF in detail.	CO-5	L4
SECTION-C			
7.	Evaluate the Convolution using Graphical Method of following sequence. $x(n) = \{3, 4, 2, 5, 6\}$ $h(n) = \{2, 3, 4, 1\}$	CO-2	L5

8.	Identify that the spectrum of the sampled signal is the infinite sum of shifted replicas of the spectrum of the original signal.	CO-3	L3
9.	<p>An LTI system is characterized by the transfer function</p> $H(Z) = \frac{1 - \left(\frac{1}{2}\right) Z^{-1}}{1 + \left(\frac{3}{4}\right) Z^{-1} + \left(\frac{1}{8}\right) Z^{-2}}$ <p>a) Examine the Impulse response of the system. b) Draw Pole Zero diagram of system.</p>	CO-4	L4

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Total No. of Pages: 2

Total No. of Questions: 09

B. Tech. (ECE), Semester – 4th

ANALOG CIRCUITS

Subject Code: BTEC-401-18

M. Code: 77565

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.	What is bias Stabilization?	CO1	L1
b.	Provide the expression for voltage gain of a feedback amplifier.	CO2	L2
c.	What is the value of gain of negative feedback amplifier with internal gain $A = 200$ and feedback factor $\beta = 1/20$?	CO1	L1
d.	Differentiate between series and shunt clipper circuits with suitable diagrams.	CO3	L2
e.	What is Q-Point in a transistor?	CO2	L1
f.	State Non- linear Distortion and Second harmonic Distortion.	CO3	L1
g.	Contrast between damped & un-damped oscillations.	CO5	L2
h.	State Barkhausen criterion for oscillation also write its expression.	CO4	L1
i.	How Class-AB Amplifier overcome the distortion of Class-B Amplifier?	CO4	L1
j.	Explain briefly the concept of multi-stage and cascade amplifiers.	CO5	L2
SECTION-B			
2.	Inspect the effect of feedback on gain and bandwidth in detail.	CO2	L4

3.	Draw the diagram for trans-conductance amplifiers. Write the values of input & output impedances for ideal conditions. Develop its amplified output relation	CO3	L3
4.	Explain transistor biasing and its necessity. Describe the potential divider biasing of a BJT in detail, along with its advantages and disadvantages	CO1	L5
5.	Write short notes on : i. Crystal Oscillators ii. Harmonic Distortion	CO4	L3
6.	Analyze the efficiency of a Class-B power amplifier (for the condition) when its power dissipation is Maximum.	CO5	L4
SECTION-C			
7.	Draw the diagram and analyze the expression for the overall gain and output impedance of voltage Series feedback amplifier.	CO3	L4
8.	Discuss the input and output characteristic curves of a transistor in the common emitter configuration. Explain the significance of these characteristics and their impact on transistor operation.	CO2	L6
9.	Define feedback. What type of feedback is used for oscillator circuit? Draw the circuit and explain the working of WIEN Bridge Oscillator, and Derive the expression for its frequency of Operation.	CO5	L5

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

	ਇੱਕ ਅਟੁੱਟ ਸਮਾਜ ਅਤੇ ਸਰਬਵਿਆਪੀ ਵਿਵਸਥਾ ਦੀ ਧਾਰਨਾ ਨੂੰ ਨਿਰਧਾਰਤ ਕਰੋ ਅਤੇ ਸਮਝਾਓ ਕਿ ਇਹ ਦੋਨਾਂ ਇੱਕ ਵਿਸ਼ਵ ਪਰਿਵਾਰ ਬਣਾਉਣ ਵਿੱਚ ਕਿਵੇਂ ਮਦਦ ਕਰ ਸਕਦੇ ਹਨ।		
10.	Analyze the universal human order and examine your role in progressing toward it. ਸਾਰਵੱਮਿਕ ਮਾਨਵ ਵਿਵਸਥਾ ਦਾ ਵਿਸ਼ਲੇਸ਼ਣ ਕਰੋ ਅਤੇ ਇਸ ਵਿਸ਼ੇ ਵਿੱਚ ਆਪਣੀ ਭੂਮਿਕਾ ਦੀ ਜਾਂਚ ਕਰੋ। ਸਰਬਵਿਆਪੀ ਮਨੁੱਖੀ ਵਿਵਸਥਾ ਦਾ ਵਿਸ਼ਲੇਸ਼ਣ ਕਰੋ ਅਤੇ ਇਸ ਵਿੱਚ ਆਪਣੀ ਭੂਮਿਕਾ ਦੀ ਜਾਂਚ ਕਰੋ।	CO5	L4
11.	Explain self-organization and health. Evaluate their role in achieving the harmony in nature. स्व-संगठन और स्वास्थ्य की व्याख्या कीजिए। प्रकृति में सामंजस्य प्राप्त करने में उनकी भूमिका का मूल्यांकन करें। 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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4.	Assume that XTAL = 11.0592 MHz, Develop a program to generate a square wave of 2 kHz frequency on pin P1.5 using Timer 0 ,Mode 1 of microcontroller 8051.	CO2	L6
5.	Discuss in detail the internal & external memory organization of 8051 & its interfacing.	CO4	L3
6.	Compare Subroutine and stack in microcontroller 8051. Also discuss the assembly language instruction related to the same.	CO3	L4
SECTION-C			
7.	Sketch and Explain functional block diagram of 8051 microcontroller. Identify and discuss role of various functional blocks in detail.	CO2	L5
8.	Show interfacing of ADC 0809 with 8051. what are the various programming steps required by 8051 to start the conversion and getting data from ADC.	CO4	L5
9.	Explain and illustrate the following 8085 instructions with examples: DAD, STA, CMP, CALL	CO1	L4

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

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

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Roll No.

Total No. of Pages: 02

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B.Tech (ECE), Semester 5th
DIGITAL SIGNAL PROCESSING

Subject Code: BTEC 502-18

M.Code: 78298

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.	Show whether the system given by the following equation is linear or non-linear. $y(n) = x(-n)$	CO-1	L1
b.	Explain the difference between auto-correlation and cross-correlation.	CO-1	L2
c.	List the different methods for the computation of linear convolution.	CO-2	L1
d.	What does "n" and "k" signify in linear convolution?	CO-2	L2
e.	Define and prove the linearity property of DFT.	CO-3	L1
f.	Show how DFT of the delayed unit impulse given by following equation is obtained. $\delta(n - n_0)$	CO-3	L2
g.	Explain the reason that FIR filter is always stable.	CO-4	L2
h.	Demonstrate direct form -I structure realization of a system described by following equation $y(n) - \frac{5}{4}y(n-1) + \frac{3}{8}y(n-2) = x(n) + \frac{7}{2}x(n-1)$	CO-5	L2
i.	Outline the main features of DSP processors.	CO-6	L2
j.	What is aliasing in decimation?	CO-6	L1

SECTION-B			
2.	Make use of the block diagram to explain the basic elements of digital signal processing system.	CO-1	L3
3.	Simply using tabular method to find linear convolution of the following two sequences. $x(n) = \{1, 1.5, 2.25, 0\}$ and $y(n) = \{-3, -1, 1, 3\}$	CO-2	L4
4.	Choose the DFT formula and compute the DFT for the following sequence. $x(n) = \{1, -1, 1, -1\}$ with $N=8$.	CO-3	L5
5.	Explain different window functions with their spectrum.	CO-5	L4
6.	Develop cascade form and direct form of IIR filter for the following transfer function $y(n) = 1.5y(n - 1) - 0.25y(n - 2) + x(n) + x(n - 1)$	CO-5	L3
SECTION-C			
7.	Explain in detail the process of sampling and reconstruction of signal in digital signal processing?	CO-1	L4
8.	Dissect the given FIR filter transfer function in direct form and cascade form. $H(Z) = (1 + 0.5z^{-1} - z^{-2})(1 - 0.25z^{-1} + z^{-2})$	CO-4	L5
9.	Explain the ADSP 2100 Processor with the help of block diagram.	CO-6	L5

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Total No. of Pages:02

Total No. of Questions: 09

B.Tech (ECE), Semester 5th
PROGRAMMING IN JAVA
Subject Code: BTEC-905D-18
M.Code: 78710

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 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 comments in Java?	CO-1	L1
b.	Compare static and instance variables in Java.	CO-1	L2
c.	Translate the statement 'Display your name' into a Java print statement.	CO-1	L2
d.	Define use of loops in Java.	CO-2	L1
e.	Explain how do-while guarantees at least one execution.	CO-2	L2
f.	Demonstrate a simple concatenation of two Strings.	CO-2	L2
g.	What is the purpose of an abstract class in Java?	CO-3	L1
h.	Show with an example how to declare an abstract method.	CO-3	L2
i.	Define ODBC driver.	CO-4	L1
j.	Summarize the advantages of using Swing over AWT.	CO-4	L2
SECTION-B			
2.	Develop a Java program that uses a method to add two numbers and return the result.	CO-1	L3
3.	Distinguish between if-else and if-else ladder with examples.	CO-2	L4
4.	Assess the significance of access modifiers in controlling data visibility in Java.	CO-3	L5
5.	Identify the working of event handling in Java with proper sequence of components, event, and listener.	CO-4	L3
6.	Evaluate the significance of Java Beans in component-based software engineering.	CO-4	L5

SECTION-C			
7.	Apply the key features of Java to analyze its differences from C and C++ programming languages.	CO-1	L3
8.	Examine the relationship between abstract classes and interfaces in designing Java applications.	CO-3	L4
9.	Recommend possible enhancements to Java's distributed technologies, RMI and CORBA, to improve their scalability.	CO-4	L5

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Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (ECE), Semester 5th
ANALOG AND DIGITAL COMMUNICATION
Subject Code: BTEC-501-18
M.Code: 78297

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 is the modulation index in AM, and why is it important?	CO-1	L1
b.	Describe the spectrum of an amplitude modulated signal.	CO-1	L2
c.	What is Adaptive Delta Modulation (ADM)?	CO-2	L1
d.	Explain in brief slope overload in Delta modulation?	CO-2	L2
e.	What is quantization noise in PCM?	CO-3	L1
f.	Explain why matched filter maximizes the output SNR?	CO-3	L2
g.	What are the advantages of coherent detection in digital modulation schemes?	CO-4	L1
h.	Differentiate between ISI in band-limited channels and dispersive channels.	CO-4	L2
i.	Define Binary Frequency Shift Keying (BFSK).	CO-5	L1
j.	Compare MSK with QPSK in terms of bandwidth and error performance.	CO-5	L2
SECTION-B			
2.	A Radio transmitter using AM has unmodulated carrier output power of 10KW and can be modulated to a maximum depth of 90% by a sinusoidal modulating voltage without causing overloading. Evaluate the value to which unmodulated carrier power may be increased without resulting in overloading if the maximum permitted modulation index is restricted to 40%?	CO-1	L5
3.	Describe Single Side Band (SSB) using the phase shift method with mathematical analysis.	CO-2	L3
4.	Break down the noise effects in angle modulation and explain the role of pre-emphasis and de-emphasis circuits.	CO-3	L4
5.	Compare coherent and non-coherent detection methods in terms of implementation complexity and performance.	CO-4	L5

6.	Explain the concept of continuous phase modulation in detail.	CO-5	L5
SECTION-C			
7.	Derive the equation of an FM signal and analyze the role of modulation index in defining sideband distribution.	CO-1	L4
8.	Compare BPSK, QPSK, and 8-PSK for their error rates and use of spectrum when there is Gaussian noise.	CO-5	L5
9.	Analyze the probability of error in Amplitude shift Keying (ASK) under the influence of Gaussian noise.	CO-4	L4

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Total No. of Pages: 02

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B.Tech ECE, Semester-5th

LINEAR INTEGRATED CIRCUITS

Subject Code: BTEC-503-18

M.Code: 78299

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.	Define constant current bias in differential amplifiers.	CO-1	L1
b.	Explain the purpose of cascading in differential amplifiers.	CO-1	L2
c.	What is meant by input bias current in Op-Amps?	CO-2	L1
d.	Draw the schematic symbol of an Op-Amp.	CO-2	L2
e.	What is the purpose of a differentiator circuit?	CO-3	L1
f.	Compare the ideal and practical Op-Amp characteristics.	CO-3	L2
g.	Define V-to-F converter.	CO-4	L1
h.	Summarize the use of a phase shift oscillator.	CO-4	L2
i.	Define a fixed voltage regulator.	CO-5	L1
j.	Compare monostable and astable multivibrator operation using IC 555.	CO-5	L2
SECTION-B			
2.	Infer the impact of parameters on a practical differential amplifier.	CO-1	L4
3.	Identify the role of each stage in the block diagram of an operational amplifier.	CO-2	L3
4.	Evaluate an expression for averaging amplifier and compute its output.	CO-3	L5
5.	Examine the role of all-pass filters in phase shift applications.	CO-4	L4
6.	Evaluate the performance of linear and switching regulators in power supply systems.	CO-5	L5

SECTION-C			
7.	Compare the performance of CE-CB cascade configuration with that of a single stage differential amplifier.	CO-1	L4
8.	Examine the design of a summing amplifier circuit for multiple input signals and justify its applications.	CO-3	L4
9.	Evaluate the frequency of a Wein Bridge Oscillator along with its applications .	CO-4	L5

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Total No. of Pages: 02

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B.Tech ECE, Semester-5th
PROJECT MANAGEMENT
Subject Code: BTEC- 505-18

M.Code: 78302

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.	Why is quality considered an objective of projects?	CO-1	L1
b.	Demonstrate why time is a critical factor in projects.	CO-1	L2
c.	Identify two types of project organizations.	CO-2	L1
d.	Illustrate how proposals are evaluated in organizations.	CO-2	L2
e.	Name two tools used in project scheduling.	CO-3	L1
f.	Contrast WBS and work packaging plan.	CO-3	L2
g.	Recall two roles of the project manager in control.	CO-4	L1
h.	Translate the importance of life cycle approach in evaluation.	CO-4	L2
i.	How network techniques like GERT differ from CPM.	CO-5	L1
j.	Compare the roles of meetings and control procedures in project coordination.	CO-5	L2
SECTION-B			
2.	Examine the role of the Project Manager during each phase of the Project Management Process.	CO-1	L4
3.	Develop a sample Request for Proposal (RFP) for a new product launch in an IT firm.	CO-2	L3
4.	Compare between Project Work System and Project Management System with suitable examples.	CO-3	L5
5.	Analyze how delays in monitoring reports can impact project schedule control and overall performance.	CO-4	L4

6.	Recommend a reporting framework in PMIS that can compare planned vs actual progress weekly.	CO-5	L5
SECTION-C			
7.	Discover the effectiveness of different stages of the project life cycle in ensuring project success.	CO-1	L4
8.	Examine the advantages and limitations of Line of Balance (LOB) technique in comparison to traditional bar chart scheduling.	CO-3	L4
9.	Justify the importance of performance indicators while assessing the overall project success.	CO-4	L5

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Total No. of Pages: 02

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B.Tech (ECE), Semester 5th

CONTROL SYSTEMS

Subject Code: BTEC-504-18

M.Code: 78300

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.	What is LVDT? List its advantages.	CO-1	L1
b.	Infer the role of control systems in automation.	CO-1	L2
c.	Write the output equation of a PID controller.	CO-2	L1
d.	How does feedback help in disturbance rejection?	CO-2	L2
e.	What is the necessary condition for applying Routh-Hurwitz criterion?	CO-3	L1
f.	Summarize various time domain test input signals.	CO-3	L2
g.	Summarize the advantages of Phase Lead-Lag Compensation Networks.	CO-4	L2
h.	Infer the role of eigenvalues in state-space analysis?	CO-5	L2
i.	Outline one performance index used in optimal control.	CO-6	L2
j.	Define diagonalization in control systems.	CO-6	L1

SECTION-B			
2.	Apply Mason's Gain Formula to find the Transfer Function $C(s)/R(s)$ for the following Signal Flow Graph: <div style="text-align: center;"> </div>	CO-1	L3
3.	For a Unity Feedback control system, the forward path Transfer Function is given by $G(s)$. Determine the Steady State Error of the System. when the inputs are (i) 5 (ii) $5t$ and (iii) $3t^2/2$. $G(s) = \frac{20}{s(s+2)(s^2+2s+20)}$	CO-2	L4
4.	What are different Time Response Specifications of a second order system when subjected to unit step Input? Define and Derive an expression for Maximum Overshoot.	CO-3	L5
5.	Why do we need compensators in control system? Explain Phase lead compensation network and derive its Transfer Function.	CO-4	L5
6.	Make use of Diagonalization method to find the State Transition Matrix (STM) e^{At} .	CO-6	L3
SECTION-C			
7.	For a unity feedback system, the open-loop transfer function is given by $G(s)$. By applying the Routh Hurwitz criterion, find the value of K for which the system is absolutely stable. Also, find the value of K for which the system is marginally stable and find the frequency of sustained oscillations also. $G(s) = \frac{K}{s(s+4)(s^2+4s+20)}$	CO-3	L3
8.	Draw the Bode Plot for the transfer function $G(s)$ of a unity feedback system. From the Bode plot compute Gain Margin and Phase Margin and comment upon the stability of system. $G(s) = \frac{36(1+0.2s)}{s^2(1+0.05s)(1+0.01s)}$	CO-4	L3
9.	A System is Characterized by the Transfer Function $Y(s)/U(s)$. Determine the State and Output equation in the matrix form and also test the observability and controllability of the system. $\frac{Y(s)}{U(s)} = \frac{2}{(s^3+6s^2+11s+6)}$	CO-5	L5

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9.	Explain the architecture of FTP. Describe its functioning. Implement four way process for termination of the connection in TCP protocol.	CO-4	L5
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Total No. of Pages: 2

Total No. of Questions: 09

B.Tech (ECE), Semester-6th
MICROWAVE AND ANTENNA ENGINEERING

Subject Code: BTEC-603-18

M.Code: 79376

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.	Why Gunn diode is called as transferred electron device?	CO-1	L1
b.	Compare O-type & M-type tubes.	CO-1	L2
c.	Interpret microwave frequency & wavelength for X & C band.	CO-1	L2
d.	How EH plane Tee act as a magic Tee?	CO-2	L1
e.	Summarize Cavity Resonator.	CO-2	L2
f.	Classify methods of Power measurement.	CO-2	L2
g.	Define Gain & Directivity.	CO-3	L1
h.	Interpret beam width with diagram.	CO-3	L2
i.	List array configurations.	CO-4	L1
j.	Interpret Broadside array.	CO-4	L2
SECTION-B			
2.	Examine the operation of two cavity klystron amplifier with the help of Applegate diagram.	CO-1	L4
3.	Analyze Scattering Matrix & its properties.	CO-2	L4
4.	Explain radiation mechanism of single & two wire antenna.	CO-3	L5
5.	Examine the concept of array of two point sources of equal amplitude & opposite phase.	CO-4	L4
6.	Explain slot antenna & its radiation mechanism.	CO-4	L5
SECTION-C			
7.	Evaluate Scattering matrix for E plane Tee.	CO-2	L5

8.	Solve expressions for electric and magnetic field components of a Hertzian dipole antenna.	CO-3	L3
9.	Solve the expression for Electric field of n isotropic point sources of equal amplitude & spacing.	CO-4	L3

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Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (ECE), Semester 6th
OPTICAL FIBERS AND COMMUNICATION

Subject Code: BTEC-602-18

M.Code:79375

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 Power Budget.	CO4	L 1
b.	Define Quantum Efficiency in fibers.	CO2	L 1
c.	Classify various types of optical fiber modes.	CO2	L 2
d.	List various components of light wave system.	CO1	L 1
e.	Compare step index and graded index fibers.	CO1	L 2
f.	Illustrate Dispersive pulse broadening.	CO3	L 2
g.	How Modal noise is formed in light wave systems?	CO3	L 1
h.	What are Optical TDM systems?	CO3	L 1
i.	What are the factors to be considered in link power budget?	CO4	L 2
j.	Differentiate between Intrinsic and Extrinsic Absorption losses in fibers.	CO1	L 2
SECTION-B			
2.	Explain the construction and working of semiconductor laser Diodes.	CO2	L 3

3.	Compare PN & PIN photo-detectors.	CO3	L 4
4.	Create the expression for calculating the power budget in optical Light wave systems.	CO4	L 6
5.	Enlist and explain different types of dispersions in optical fibers.	CO1	L 3
6.	Explain the cable and connectors in optical fibers.	CO4	L 5
SECTION-C			
7.	Apply the principle of total internal reflection and derive the expression for critical angle when a ray of light is entering from air to glass optical fiber.	CO2	L 3
8.	A photodiode has quantum efficiency 65% when photons of energy 1.5×10^{-19} J are incident upon it. a) Calculate the operating wavelength b) Calculate the incident optical power required to obtain a photocurrent of 2.5microamperes.	CO3	L 4
9.	Discuss design issues and fabrication methods in optical fibers.	CO4	L 6

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Total No. of Questions: 09

B.Tech (ECE), Semester-6th

OPERATING SYSTEM

Subject Code: BTCS-402-18

M. Code: 79262

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.	Classify different types of operating system.	CO1	L-2
b.	Illustrate states of the process.	CO2	L-1
c.	Compare primitive and Non primitive scheduling scheme.	CO3	L-2
d.	Classify Kernel and user Mode in operating system.	CO1)	L-2
e.	Enlist the functions of BIOS.	CO1	L-1
f.	Outline CSCAN and CLOOK method in operating system.	CO6	L-2
g.	Contrast internal fragmentation with external fragmentation.	CO4	L-2
h.	Define the term File. List various attributes of a File.	CO5	L-1
i.	Why hold and wait condition necessary for deadlock?	CO3	L-1
j.	What are the various allocation methods in File Management?	CO5	L-1
SECTION-B			
2.	Sketch and develop one to many multithreading model.	CO2	L-3
3.	Analyze the importance of Short Term Scheduler in operating system.	CO3	L-4
4.	Examine the concept of compaction and why it is used?	CO4	L-4

5.	Classify and explain the structure of disk in an operating system.	CO6	L-4
6.	Assess various CPU scheduling algorithms used in operating systems with a suitable example.	CO3	L-5
SECTION-C			
7.	Evaluate the efficiency of different disk scheduling algorithms in optimizing seek time and disk performance. Using the given data (200 tracks numbered 0–199, request queue: 82, 170, 43, 140, 24, 16, 190, with the R/W head initially at track 50), analyze whether the FCFS scheduling algorithm provides an effective solution.	CO6	L-5
8.	Compare various methods for free space management in operating system.	CO5	L-4
9.	Interpret various functions of distributed operating system and timesharing operating system.	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.

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Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (ECE), Semester 7th
DATABASE MANAGEMENT SYSTEM

Subject Code: -BTCS-501-18

M.Code: - 90493

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.	List the advantages of DBMS.	CO-1	L1
b.	Explain the Query Processor.	CO-1	L2
c.	Define an Entity in an ER model.	CO-2	L1
d.	Differentiate between strong entity and weak entity with an example.	CO-2	L2
e.	List any two data types used in MySQL.	CO-3	L1
f.	List two differences between primary index and secondary index.	CO-3	L2
g.	What is authorization in DBMS?	CO-4	L1
h.	Explain about organization of records in files.	CO-4	L2
i.	How is MAC different from DAC?	CO-5	L1
j.	Give an example where RBAC can be used effectively.	CO-5	L2
SECTION-B			
2.	Analyze the difference between logical and physical levels of data abstraction.	CO-1	L4
3.	Design an Entity Relationship (E-R) diagram for a hospital with a set of patients and a set of medical doctors.	CO-2	L6
4.	Utilize SQL commands to create, insert, update, and delete records.	CO-3	L3
5.	Classify the ACID properties of transaction.	CO-4	L4
6.	Explain in detail Storage structure.	CO-5	L5

SECTION-C			
7.	Examine the various benefits of using a database approach compared to a traditional file system approach.	CO-1	L4
8.	Evaluate the suitability of sequential versus direct access storage strategies for large databases. Give reasons for your answer.	CO-3	L5
9.	Apply the concept of conflict serializability to check if a given schedule is serializable.	CO-4	L3

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Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech ECE, Semester-7th

SOFT COMPUTING

Subject Code: BTEC-908D-18

M.Code: 90681

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 hybrid Soft Computing systems.	CO-1	L1
b.	Explain soft computing with reference to fuzzy logic concept.	CO-1	L2
c.	What is mutation in Genetic Algorithms?	CO-2	L1
d.	Outline roulette wheel selection in GA.	CO-2	L2
e.	Use delta learning rule for $X=[0.5,1]$, and target $y=[1]$, weight vector $=[0.3,0.2]$, $\eta=0.1$. Find the updated weights.	CO-3	L1
f.	Explain supervised and unsupervised learning.	CO-3	L2
g.	List types of fuzzy sets.	CO-4	L1
h.	Explain fuzzification and defuzzification process.	CO-4	L2
i.	Give examples of swarm intelligence and explain any one.	CO-5	L1
j.	Define swarm intelligence.	CO-5	L2
SECTION-B			
2.	Distinguish between hard computing and soft computing with suitable examples.	CO-1	L4
3.	If $P1 = 11100011$, $P2 = 00011100$. Perform two-point crossover with cut points between bits 2-3 and 5-6. Evaluate the resulting offspring.	CO-2	L3
4.	Explain Delta rule and Perceptron learning.	CO-3	L5
5.	Discuss Fuzzy Inference Systems with an example.	CO-4	L4
6.	Explain ant colony optimization with an example.	CO-5	L5

SECTION-C			
7.	List all the variants of Genetic algorithm. Compare Simple GA (SGA) with steady-state GA and other variants with examples.	CO-2	L4
8.	Compare ADALINE and MADALINE architectures and training algorithms.	CO-3	L4
9.	For the two fuzzy sets, $B_1 = \{1/1.0+0.75/1.5+0.3/2.0+0.15/2.5+0/3.0\}$ and $B_2 = \{1/1.0+0.6/1.5+0.2/2.0+0.1/2.5+0/3.0\}$, Evaluate $B_1 \cup B_2$, $B_1 \cap B_2$, Complement of B_1 , Difference $B_1 B_2$, Complement of $B_1 \cup B_2$.	CO-4	L5

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Roll No.

Total No. of Pages:02

Total No. of Questions: 09

B.Tech (ECE), Semester 7th
ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Subject Code: BTEC -909D-18

M.Code: 90686

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.	Summarize the main types of AI.	CO-1	L1
b.	Compare model-based and goal-based agents.	CO-1	L2
c.	Define a search strategy.	CO-2	L1
d.	Differentiate between informed and uninformed search.	CO-2	L2
e.	What is reasoning in AI?	CO-3	L1
f.	Compare categories and objects with the help of examples.	CO-3	L2
g.	Relate expert system with a real life example.	CO-4	L1
h.	Explain the role of SWI-Prolog in AI.	CO-4	L2
i.	Define regression.	CO-5	L1
j.	Explain how a decision tree makes predictions.	CO-5	L2
SECTION-B			
2.	Examine whether current AI systems qualify as strong AI. Justify your answer using a real life example.	CO-1	L4
3.	Apply AI agent concepts to explain the working of a robotic vacuum cleaner.	CO-2	L3
4.	Determine the role of ontology in AI. How does it improve knowledge representation and reasoning?	CO-3	L5
5.	Examine the model of an Expert System with the help of a diagram.	CO-4	L4
6.	Explain supervised learning applications in healthcare.	CO-5	L5
SECTION-C			
7.	Distinguish between A* and Greedy Best-First Search strategies. Analyze the trade-off between optimality and human-like reasoning in both the search strategies.	CO-1	L4

8.	Examine the Internet Shopping World example in knowledge representation. How does it illustrate reasoning with categories and default rules?	CO-3	L4
9.	Explain the concept of agent architecture to smart home system. Compare reflex, goal-based, and utility-based approaches.	CO-4	L5

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Total No. of Pages: 02

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B.Tech ECE, Semester- 7th

PYTHON PROGRAMMING

Subject Code: BTEC-907D-18

M.Code: 90676

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 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.	Which role does the interpreter play in Python execution?	CO-1	L1
b.	Interpret the result of the expression $7 + 3 * 2$.	CO-1	L2
c.	Define a dictionary in Python.	CO-2	L1
d.	Show an example of string repetition.	CO-2	L2
e.	List two modes of opening a file in Python.	CO-3	L1
f.	Outline the purpose of try-except block.	CO-3	L2
g.	Define a module in Python.	CO-4	L1
h.	Compare single inheritance and multiple inheritance.	CO-4	L2
i.	Name the Python module that provides ready-made functions for searching.	CO-5	L1
j.	Compare the performance of sort() and sorted() in Python.	CO-5	L2
SECTION-B			
2.	Categorize the steps of the Python programming cycle and represent them in a flow diagram.	CO-1	L4
3.	Apply set and list operations in Python to demonstrate their key differences with an example.	CO-2	L3
4.	Judge the effectiveness of assertions compared to exception handling for error management.	CO-3	L5

5.	Recommend scenarios where multiple inheritance is useful in Python programming.	CO-4	L4
6.	Compare the working principles, performance, and use cases of linear search, binary search in Python.	CO-5	L5
SECTION-C			
7.	Defend the importance of operator precedence rules in ensuring correct program output.	CO-1	L5
8.	Examine why the sieve outperforms naive primality tests by discussing time complexity and memory footprint.	CO-3	L4
9.	Classify the types of inheritance in Python with suitable program.	CO-4	L4

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B.Tech (ECE) Semester 7th
COMPUTER ORGANISATION & ARCHITECTURE

Subject Code: BTES401-18

M.Code: 90491

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 two differences between hardwired and micro-programmed control units.	CO-1	L1
b.	Contrast synchronous and asynchronous data transfers.	CO-1	L2
c.	What is the size of the program counter in the 8085 processor?	CO-2	L1
d.	Explain how the control unit manages instruction execution.	CO-2	L2
e.	List two types of hierarchical memory.	CO-3	L1
f.	Contrast direct-mapped and fully associative cache.	CO-3	L2
g.	Define SCII and USB as I/O interfaces.	CO-4	L1
h.	Demonstrate how a DMA controller transfers data between memory and an I/O device.	CO-4	L2
i.	Define pipelining in computer architecture.	CO-5	L1
j.	Contrast structural hazard and control hazard.	CO-5	L2
SECTION-B			
2.	Organize Integer Addition and Subtraction Algorithm.	CO-1	L3
3.	Build a description of the registers of the 8085 microprocessor and state their functions.	CO-2	L3
4.	Assess how advances in cache memory design have influenced overall processor performance.	CO-3	L5

5.	Contrast between privileged and non-privileged instructions.	CO-4	L4
6.	Adapt synchronization mechanisms to handle memory consistency in parallel systems.	CO-5	L6
SECTION-C			
7.	Categorize the structure and working of semiconductor memory technologies (SRAM, DRAM, ROM) and inspect their function in the memory hierarchy.	CO-1	L4
8.	Compare and contrast the three cache mapping techniques and discover their advantages, disadvantages, and typical use cases.	CO-3	L4
9.	Apply and analyse Booth's multiplication algorithm for two signed numbers. Conclude how it improves efficiency over shift-and-add.	CO-2	L5

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