

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

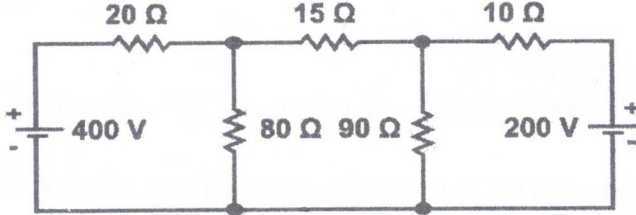
INSTRUCTIONS TO CANDIDATES:

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

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.

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

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.

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

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.

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

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

Roll No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Total No. of Pages: 02

Total No. of Questions: 09

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

CHEMISTRY-I

Subject Code: BTCH101-18

M.Code: 75343

Date of Examination: 02-12-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What are chromophores? Give example.	CO3	L1
b.	Outline dry corrosion of metals.	CO2	L2
c.	Recall the term penetration of orbitals.	CO4	L1
d.	Why Electron gain enthalpy of noble gases comes out to be positive?	CO4	L1
e.	Show dipole-dipole interactions through example.	CO1	L2
f.	List differences between enantiomers and 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.		

1/M-75343

	(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

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

2/M-75343

Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

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

CHEMISTRY-I

Subject Code: BTCH101-23

M.Code: 93800

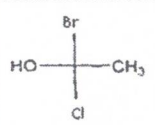
Date of Examination: 02-12-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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

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

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

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

Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

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

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

Roll No.

Total No. of Pages: 2

Total No. of Questions: 09

B.Tech (ME), Sem-1,(2)
ELECTROMAGNETISM
Subject Code: BTPPH103-18
M.Code: 75357
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.	Illustrate the expression for the electric potential due to a point charge.	CO1	L2
b.	What is electric polarization?	CO1	L1
c.	Summarize Biot-Savart law.	CO2	L2
d.	What does the equation $\nabla \cdot \mathbf{B} = 0$ signify physically?	CO2	L1
e.	Illustrate one example each of diamagnetic, paramagnetic, and ferromagnetic materials.	CO2	L2
f.	Explain Lenz's law.	CO3	L2
g.	Interpret the mathematical form of the continuity equation.	CO3	L2
h.	What is Faraday's laws of electromagnetic induction?	CO3	L1
i.	Define polarization of an electromagnetic wave.	CO4	L1
j.	Tell one application of polarized light.	CO4	L1
SECTION-B			
2.	Analyze the relationship between the divergence and curl of an electrostatic field and explain how these lead to the electrostatic potential satisfying Laplace's and Poisson's equations.	CO1	L4
3.	Examine the process of magnetization in ferromagnetic materials. Explain how magnetic domains contribute to hysteresis, and give the significance of the B-H curve.	CO2	L4
4.	Interpret the Poynting theorem, showing how it expresses the flow and conservation of electromagnetic energy in space.	CO3	L5

5.	Identify how linear, circular, and elliptical polarizations are produced by superposition of two orthogonal electric field components.	CO4	L3
SECTION-C			
6.	Utilize the Uniqueness theorem for electrostatic potential and give its significance using Faraday's cage as an example of shielding effect.	CO1	L3
7.	Analyze and compare the magnetic behavior of diamagnetic and paramagnetic materials in terms of their atomic structure, magnetic susceptibility.	CO2	L4
8.	Evaluate Maxwell's equations in a non-conducting medium, explaining how permeability affects the propagation of electromagnetic waves.	CO3	L5
9.	Apply Maxwell's equations to derive the wave equation for electromagnetic waves in free space.	CO4	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.

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

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 (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

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

Roll No.

Total No. of Questions: 09

Total No. of Pages:04

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

ENGLISH & PROFESSIONAL COMMUNICATION

Subject Code: 25C1EPU-101

M.Code:

Date of Examination: 23-12-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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

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

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

	walking more, choosing nutritious foods, and reducing stress can make a big difference. It is essential to prioritize health to lead a fulfilling life.		
5.	<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: 02

Total No. of Questions: 08

M.Tech (MECHANICAL ENGINEERING), Semester-1st

FINITE ELEMENT ANALYSIS

Subject Code: 25C1MEP-102

M.Code:

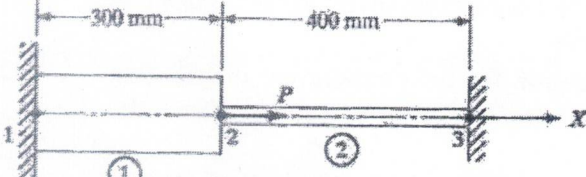
Date of Examination: 23-12-2025

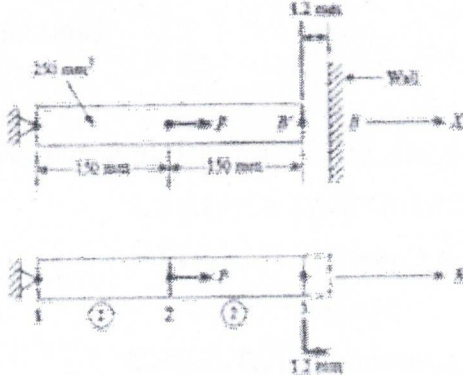
Time: 3 Hrs.

Max. Marks: 100

INSTRUCTIONS TO CANDIDATES:

1. Attempt any FIVE questions in all, out of EIGHT questions.
2. Each question carries TWENTY marks.

Q. No.	Question	Course Outcome	Bloom's Level
1.	<p>Consider the bar shown in Fig. An axial load $P = 200 \times 10^3$ N is applied as shown. Using the penalty approach for handling boundary conditions, solve the following:</p> <p>(a) nodal displacements (b) stress in each material. (c) reaction forces.</p>  <p style="text-align: center;"> ① ② </p> <p style="text-align: center;"> Aluminum Steel </p> <p style="text-align: center;"> $A_1 = 2400 \text{ mm}^2$ $A_2 = 600 \text{ mm}^2$ </p> <p style="text-align: center;"> $E_1 = 70 \times 10^9 \text{ N/m}^2$ $E_2 = 200 \times 10^9 \text{ N/m}^2$ </p>	CO1	L3
2a.	Show the stiffness matrix for a spring element and develop the stiffness matrix representation of a spring element.	CO1	L2
2b.	Explain the Finite Element Method (FEM) and describe its basic concept. Also state its primary purpose in engineering and science.	CO1	L2
3.	List various trial functions used in weighted residual methods. Categorize the types of trial functions applied in weighted residual methods.	CO2	L4
4.	In Fig., a load $P = 60 \times 10^3$ N is applied as shown. Determine the displacement field, stress and support reactions in the body. Take $E = 20 \times 10^3 \text{ N/mm}^2$.	CO2	L5

			
5a.	Explain the compatibility equations used in FEM analysis and the role of compatibility equations in finite element analysis.	CO3	L5
5b.	Develop the FEM procedure for analyzing 2D steady-state conduction. Explain the steps involved in applying FEM to 2D steady conduction problems.	CO3	L6
6.	Determine the stress-strain relations for one-dimensional problems. Recall the fundamental stress-strain relationships in one-dimensional analysis.	CO3	L5
7	Classify heat transfer problems into conduction, convection, and radiation types. Categorize different heat transfer problems based on conduction, convection, and radiation mechanisms.	CO4	L4
8a.	Explain the FEM procedure for solving convection problems. Summarize the steps involved in applying FEM to convection analysis.	CO4	L5
8b.	<p>Determine an expression for the temperature distribution and amount of heat transferred through the shaft for the following data:</p> <p>A temperature rise of 60°C in a circular shaft of 60 mm diameter is caused by the amount of heat generated due to friction in the bearing mounted on the crankshaft. The thermal conductivity of the shaft material is $50 \text{ W/m}^{\circ}\text{C}$ and the heat transfer coefficient is $6.5 \text{ W/m}^2\text{C}$. Assume that the shaft is a rod of infinite length.</p>	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.

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

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.	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.

4.	Solve the differential equation: $x^2 \frac{d^2y}{dx^2} + 5x \frac{dy}{dx} - 5y = 24x \log x$.	CO2	L3
5.	If $f(z) = u + iv$ is an analytic function of z and $u - v = \frac{\cos x + \sin x - e^{-y}}{2 \cos x - e^y - e^{-y}}$ Examine $f(z)$ subject to the condition $f\left(\frac{\pi}{2}\right) = 0$.	CO3	L4
SECTION-C			
6.	Solve: $(1 - x^2) \frac{d^2y}{dx^2} + 2y = 0$ at $x = 0$ given that $y(0) = 4, y'(0) = 5$.	CO2	L3
7.	Examine the necessary and sufficient conditions of the equation $Mdx + Ndy = 0$ (where M and N are functions of x and y with the condition that $M, N, \frac{\partial M}{\partial y}, \frac{\partial N}{\partial x}$ are continuous functions of x and y) may be exact.	CO1	L4
8.	Determine the derivatives of $w = \log z$, where $z = x + iy$, $z \neq 0$ and also test that Cauchy's Reimann equation satisfies it.	CO3	L5
9.	Prove that $\int_{-\infty}^{\infty} \frac{dx}{(z^2+1)^3} = \frac{3\pi}{8}$ by applying calculus of residue.	CO4	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.	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.

Roll No.

Total No. of Pages: 2

Total No. of Questions: 09

B.Tech (ME), Sem-1,(2)
ELECTROMAGNETISM
Subject Code: BTPPH103-18
M.Code: 75357
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.

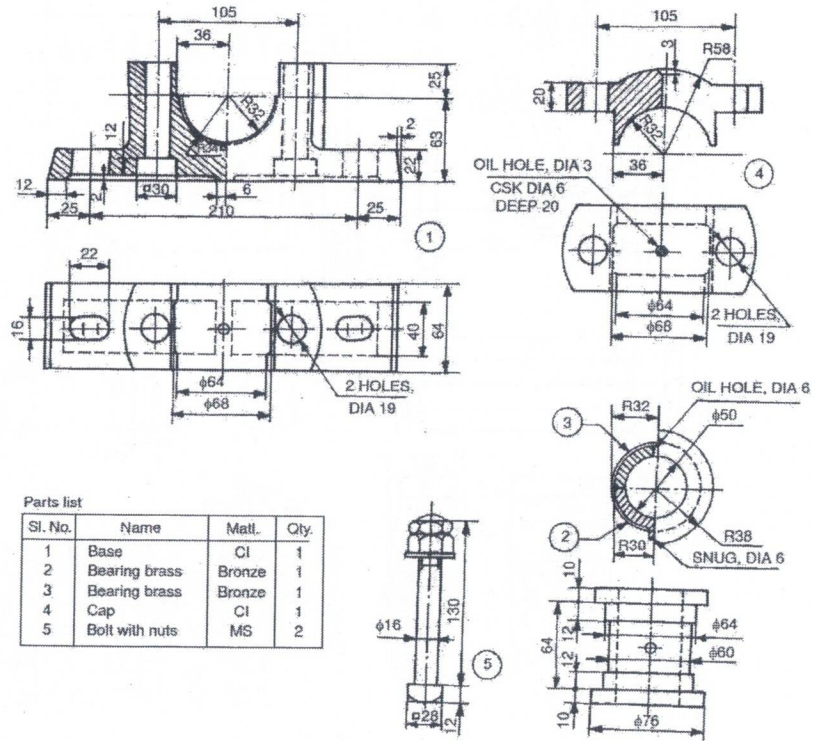
Q.No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Illustrate the expression for the electric potential due to a point charge.	CO1	L2
b.	What is electric polarization?	CO1	L1
c.	Summarize Biot-Savart law.	CO2	L2
d.	What does the equation $\nabla \cdot \mathbf{B} = 0$ signify physically?	CO2	L1
e.	Illustrate one example each of diamagnetic, paramagnetic, and ferromagnetic materials.	CO2	L2
f.	Explain Lenz's law.	CO3	L2
g.	Interpret the mathematical form of the continuity equation.	CO3	L2
h.	What is Faraday's laws of electromagnetic induction?	CO3	L1
i.	Define polarization of an electromagnetic wave.	CO4	L1
j.	Tell one application of polarized light.	CO4	L1
SECTION-B			
2.	Analyze the relationship between the divergence and curl of an electrostatic field and explain how these lead to the electrostatic potential satisfying Laplace's and Poisson's equations.	CO1	L4
3.	Examine the process of magnetization in ferromagnetic materials. Explain how magnetic domains contribute to hysteresis, and give the significance of the B-H curve.	CO2	L4
4.	Interpret the Poynting theorem, showing how it expresses the flow and conservation of electromagnetic energy in space.	CO3	L5

5.	Identify how linear, circular, and elliptical polarizations are produced by superposition of two orthogonal electric field components.	CO4	L3
SECTION-C			
6.	Utilize the Uniqueness theorem for electrostatic potential and give its significance using Faraday's cage as an example of shielding effect.	CO1	L3
7.	Analyze and compare the magnetic behavior of diamagnetic and paramagnetic materials in terms of their atomic structure, magnetic susceptibility.	CO2	L4
8.	Evaluate Maxwell's equations in a non-conducting medium, explaining how permeability affects the propagation of electromagnetic waves.	CO3	L5
9.	Apply Maxwell's equations to derive the wave equation for electromagnetic waves in free space.	CO4	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.

6.	Examine the working of a differentiator using op-amp and list its limitations.	CO-3	L4
SECTION-C			
7.	Analyze the working of centre-tap bridge rectifier with suitable diagram. Compare its efficiency and PIV with half wave rectifier.	CO-1	L4
8.	Distinguish between comparator and Schmitt trigger operation using op-amps.	CO-3	L5
9.	Evaluate a) Using K map for min terms 1,2,4,6,7,9,15 + d(3,5,8,13) b) Using 2's complement, subtract 678 from 759	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.



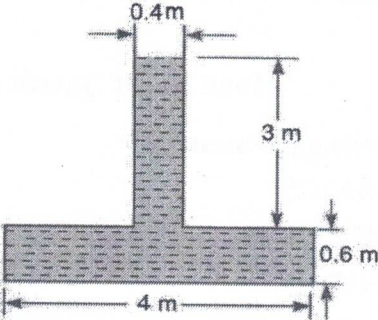
Parts list

Sl. No.	Name	Matl.	Qty.
1	Base	CI	1
2	Bearing brass	Bronze	1
3	Bearing brass	Bronze	1
4	Cap	CI	1
5	Bolt with nuts	MS	2

Figure 2

SECTION-C			
7.	A gas undergoes a reversible non-flow process according to the relation $p = (-3V + 15)$ where V is the volume in m^3 and p is the pressure in bar. Determine the work done when the volume changes from 3 to 6 m^3 . Also discuss the criteria of sign conventions for work and heat transfer.	CO-1	L3
8.	Make use of compression ratio to calculate the efficiency of Diesel Cycle.	CO-4	L3
9.	Explain internal combustion engine. List the parts of an IC engine and discuss the functions of following parts: a) spark plug b) piston rings c) crank d) connecting rod in the operation of an internal combustion engine.	CO-5	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.

			
5.	Water is flowing through a pipe of 5 cm diameter under a pressure of 29.43 N/cm ² (gauge) and with mean velocity of 2.0 m/s. Evaluate the total head or total energy per unit weight of the water at a cross-section, which is 5 m above the datum line.	CO-4	L5
6.	Solve for the discharge of water flowing over a rectangular notch of 2 m length when the constant head over the notch is 300 mm. Take $C_d=0.60$.	CO-6	L3
SECTION-C			
7.	The surface tension of water in contact with air at 20°C is 0.0725 N/m. The pressure inside a droplet of water is to be 0.02N/cm ² greater than the outside pressure. Calculate the diameter of the droplet of water.	CO-1	L3
8.	Make use of fluid dynamics principle; derive Euler's equation of motion along a stream line for an ideal fluid and explain how this is integrated to get Bernoulli's equation, clearly stating the assumptions.	CO-4	L3
9.	The resisting force R of a supersonic plane during flight can be considered as dependent upon the length L of the aircraft velocity V, air density ρ and bulk modulus K of the air. Express the functional relationship between these variables and the resisting force.	CO-5	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 (ME), Semester-3rd
STRENGTH OF MATERIALS-I

Subject Code: BTME304-18

M.Code: 76421

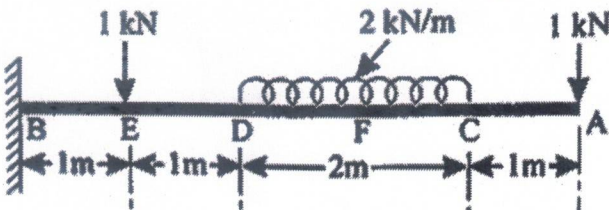
Date of Examination: 06-12-2025

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.	Define elastic limit.	CO-1	L1
b.	Explain the generalised Hooke's law.	CO-1	L2
c.	Name different types of beams used in practice.	CO-2	L1
d.	Compare simply supported and overhanging beams.	CO-2	L2
e.	Define flitched beam.	CO-3	L1
f.	Explain flexural rigidity.	CO-3	L2
g.	Outline the assumptions of torsion equation.	CO-4	L2
h.	Compare crushing and buckling in compression members.	CO-5	L2
i.	Illustrate the elastic curve of a simply supported beam under a central point load.	CO-6	L2
j.	List the methods used to determine Slope and Deflection.	CO-6	L1
SECTION-B			
2.	Construct the Mohr's Circle for the given condition (shear = 60 MPa, normal stress = ± 50) and interpret the maximum shear stress.	CO1	L3
3.	Analyze the shear force and bending moment diagrams for the cantilever beam loaded as shown in the given figure. 	CO2	L4

4.	Evaluate the maximum bending stress induced and the corresponding bending moment in a steel plate 120 mm wide and 20 mm thick when bent into a circular arc of radius 10 m ($E = 2 \times 10^5 \text{ N/mm}^2$).	CO3	L5
5.	Evaluate the safe torque for a hollow shaft of 80 mm external and 50 mm internal diameter under an allowable shear stress of 45 MPa.	CO4	L5
6.	Apply the double integration method to calculate slope and deflection of a simply supported beam under a uniformly distributed load.	CO6	L3
SECTION-C			
7.	Apply the concepts of thermal expansion and stress-strain relationships to determine the free expansion of a 25 mm steel rod when heated from 20°C to 65°C, and compute the resulting thermal stresses when (i) expansion is completely prevented, and (ii) expansion is permitted by 6 mm, given that $\alpha = 12 \times 10^{-6}/^\circ\text{C}$ and $E = 2 \times 10^5 \text{ N/mm}^2$.	CO1	L3
8.	Develop the torsion equation with clearly stated assumptions.	CO4	L3
9.	Evaluate the performance of a timber column 15 cm \times 20 cm in section and 6 m long with both ends fixed. Given that the Young's modulus of timber is 17.5 kN/mm ² , determine (i) the crippling load and (ii) the safe load for the column, taking a factor of safety of 3.	CO5	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: 10

MBA, Semester-4th
WORKSHOP ON INDIAN ETHOS

Subject Code: MBA 403-18

M.Code: 77821

Date of Examination: 16/12/2025

Time: 3 Hrs.

Max. Marks:60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of EIGHT questions carrying TWO marks each.
2. SECTION-B consists of FOUR subsections: Units-I, II, III & IV. Each subsection contains TWO questions, each carrying EIGHT marks each and student has to attempt any ONE question from each subsection.
3. SECTION-C is COMPULSORY and consists of ONE Case Study carrying TWELVE marks.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define the term Indian Ethos in management.	CO1	L-1
b.	Explain the management lessons learned from Mahabhartar.	CO3	L-2
c.	What do you mean by Work Ethos?	CO1	L-1
d.	Illustrate any two secular values important in Indian work culture.	CO2	L-2
e.	Define stress and mention one of its causes at the workplace.	CO4	L-1
f.	Explain the importance of Gurukul System of Learning.	CO5	L-2
g.	Why it is important to understand the concept of Karma in today's scenario.	CO6	L-1
h.	Outline any two Laws of Karma with brief meaning.	CO6	L-2
SECTION-B			
UNIT-I			
2.	Identify how principles from Kautilya's Arthashastra can be applied to modern corporate governance.	CO3	L-3
3.	Compare and contrast Indian and Western management philosophies with suitable examples.	CO1	L-4
UNIT-II			
4.	Identify the relevance of value-based management in the globalized business environment.	CO2	L-3

5.	Conclude how trans-cultural human values influence managerial decision-making in multinational organizations.	CO2	L-5
UNIT-III			
6.	Identify the role of meditation and yoga in enhancing managerial effectiveness and reducing workplace stress.	CO4	L-3
7.	Analyze the leadership qualities of a Karta in a Joint Hindu Family business and their applicability in modern corporations.	CO4	L-4
UNIT-IV			
8.	Examine the key features of the Gurukul System of Learning and discuss its relevance to modern management education.	CO5	L-4
9.	Explain the concept of Corporate Karma. Suggest methods through which organizations can cultivate good corporate karma.	CO6	L-5
SECTION-C			
10.	<p>Case Study</p> <p>Sattva Foods Pvt. Ltd. is a mid-sized organic food company inspired by Indian heritage and Vedic principles. Its founder, Ananya Rao, believes that profit should be a by-product of ethical and value-based practices. The firm promotes "Ahimsa in Business" by ensuring cruelty-free supply chains and supporting rural women farmers. However, when competition increased, a few managers suggested cutting costs by sourcing cheaper ingredients of uncertain origin. Ananya was torn between maintaining ethical purity and sustaining the company's market position.</p> <p>a) Appraise the Indian Ethos principles reflected in Sattva Foods' philosophy.</p> <p>b) Determine the ethical dilemma faced by Ananya Rao using the concept of Nishkama Karma.</p> <p>c) Recommend strategies rooted in Indian management ethos to help balance business growth with ethical practices.</p>	CO6	L-5

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.

UNIT-IV			
8.	Distinguish between Operating and Economic Exposure. Examine the different methods for the Management of Economic Exposure.	CO5	L4
9.	Assess the meaning of Swaps and classify types of swaps in detail.	CO5	L5
SECTION-C			
10.	<p>The International Monetary System (IMS) has undergone significant transformations over the past century, shaped by global economic shifts, political decisions, and financial crises. Initially anchored by the Gold Standard in the late 19th century, countries maintained fixed exchange rates by tying their currencies to gold. While this system promoted stability, it lacked flexibility and collapsed during the Great Depression. In 1944, the Bretton Woods Agreement established a new framework, pegging currencies to the US dollar, which was convertible to gold. Institutions like the International Monetary Fund (IMF) and the World Bank were created to support global financial stability. However, rising US inflation and trade deficits led to the collapse of Bretton Woods in 1973, ushering in the era of floating exchange rates.</p> <p>Since then, the IMS has operated under a decentralized model where currencies fluctuate based on market forces. This system offers flexibility but has also exposed economies to volatility and speculative attacks. Crises such as the 1997 Asian Financial Crisis and the 2008 Global Financial Crisis revealed vulnerabilities in global financial governance, prompting calls for reform. The rise of digital currencies and geopolitical tensions further challenge the IMS's ability to ensure stability and cooperation. Today, the IMF still plays an important role in helping countries deal with financial crises, work together on economic policies, and monitor global economic health. However, there are still concerns about whether the system is strong enough and fair enough for a world with many powerful countries.</p> <p>Questions:</p> <p>(a) Interpret the effectiveness of the IMF's role in managing global financial crises since the collapse of the Bretton Woods system.</p> <p>(b) Compare the stability and adaptability of fixed versus floating exchange rate systems in the context of recent financial crises.</p>	CO1	L5

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

Roll No.

Total No. of Pages: 02

Total No. of Questions: 10

MBA, Semester -4th**INTEGRATED MARKETING COMMUNICATION AND SALES MANAGEMENT**

Subject Code: MBA 923-18

M.Code: 77808

Date of Examination: 02-12-2025

Time: 3 Hrs.

Max. Marks:60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of EIGHT questions carrying TWO marks each.
2. SECTION-B consists of FOUR subsections: Units-I, II, III & IV. Each subsection contains TWO questions, each carrying EIGHT marks each and student has to attempt any ONE question from each subsection.
3. SECTION-C is COMPULSORY and consists of ONE Case Study carrying TWELVE marks.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	List any two purposes of IMC.	CO1	L1
b.	Explain the steps involved in developing an IMC programme.	CO2	L2
c.	Define creativity in advertising with one element of creative strategy.	CO2	L1
d.	Infer the term media evaluation.	CO2	L2
e.	What is Public Relations and list any two PR tools.	CO3	L1
f.	Interpret the meaning of Internet Advertising and illustrate any two of its types.	CO5	L2
g.	Recall the meaning of sales organization.	CO5	L1
h.	Outline the term sales quota.	CO6	L2
SECTION-B			
UNIT-I			
2.	Identify the components of IMC and discuss the effectiveness of marketing communication.	CO1	L3
3.	Classify various advertising agencies, their functions and the role in designing effective advertising campaigns.	CO1	L4
UNIT-II			
4.	Identify the importance and tools of promotion and stating push and pull strategies with examples.	CO2	L3

5.	Explain the advantages and disadvantages of Internet advertising in a global environment.	CO5	L5
UNIT-III			
6.	Build the insight into the purpose of sales management and choose the roles of sales executives in developing, organizing, and utilizing strategies for planning and controlling sales operations.	CO4	L3
7.	Distinguish among product, pricing and distribution policies in sales-related marketing decisions.	CO4	L4
UNIT-IV			
8.	Examine the significance of sales budgets, sales contests and showroom displays in sales operations.	CO5	L4
9.	Compare different types of salesmen and their role in influencing customer psychology.	CO6	L5
SECTION-C			
10.	<p>FreshLife, a leading FMCG brand, is aiming to boost its market share through a comprehensive Integrated Marketing Communications (IMC) plan. The company plans to use a mix of traditional and digital media channels, including advertising, public relations (PR), direct marketing, sales promotions, and a strong digital media presence. The IMC strategy will focus on enhancing brand visibility and building deeper connections with consumers through personalized messaging and targeted campaigns. Alongside this, FreshLife is restructuring its salesforce to ensure more efficient operations. This includes reassigning territories, setting clear quotas, and implementing rigorous sales training programs to enhance team performance. The company will also invest in sales technology, such as CRM tools, to streamline processes and improve customer relationship management. The ultimate goal is to increase market share by 5% over the next year, achieve a 10% rise in sales, and enhance customer engagement across digital platforms. Through a combination of effective marketing strategies and a well-trained, efficient sales team, FreshLife aims to strengthen its position in a highly competitive market.</p> <p>Questions</p> <p>(a) Elaborate the relevance and effectiveness of FreshLife's IMC tools and promotional strategies.</p> <p>(b) Develop a complete IMC and sales operations plan including media strategy, online promotions, and salesforce design, budgeting and evaluation mechanisms.</p>	CO6	L6

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

Roll No.

Total No. of Pages: 2

Total No. of Questions: 10

MBA, Semester : 4th**INTERNATIONAL AND SOCIAL MEDIA MARKETING**

Subject Code: MBA-925-18

M.Code: 77810

Date of Examination: 29-11-2025

Time: 3 Hrs.

Max.Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. **SECTION-A** is **COMPULSORY** consisting of **EIGHT** questions carrying **TWO** marks each.
2. **SECTION-B** consists of **FOUR** subsections: **Units-I, II, III & IV**. Each subsection contains **TWO** questions, each question carrying **EIGHT** marks and student has to attempt any **ONE** question from each subsection.
3. **SECTION-C** is **COMPULSORY** and consists of **ONE** Case Study carrying **TWELVE** marks.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What is International Marketing?	CO1	L1
b.	Define the role of NAFTA.	CO2	L1
c.	Explain international pricing strategies.	CO3	L2
d.	Illustrate international promotion mix.	CO3	L2
e.	List any 4 social media channels along with their use-case.	CO4	L1
f.	Outline social media marketing-mix.	CO4	L2
g.	Recall the elements of social media marketing campaigns.	CO5	L1
h.	Summarize the concept of Big data.	CO5	L1
SECTION-B			
UNIT-I			
2.	Build the concept of 'international business environment' and identify the effect of social and economic environment on business at international level.	CO1	L3
3.	Examine the various international trade barriers and regional blocks in detail.	CO2	L4
UNIT-II			
4.	Assess India's EXIM Policy framework and its role in mitigating international trade barriers.	CO2	L5
5.	Identify the various communication strategies in international marketing and Develop the elements of international promotion-mix.	CO3	L3

UNIT-III			
6.	Analyse social media benefits in international promotional frameworks by inspecting its advantages.	CO3	L4
7.	Explain the following: a) Evolution of the digital consumer b) Rise of internet and E concepts	CO4	L5
UNIT-IV			
8.	Assess SEM and SEO tools drawing a comparative analysis as well as recommend a strategy for both to improve visibility/traffic in a competitive digital landscape.	CO4	L5
9.	Examine the emerging importance of social media in Search Engine Optimization.	CO5	L4
SECTION-C			
10.	<p>VibeSkin, a Delhi-based natural skincare brand, launched “GlowNaturally” in 2024 to capture eco-conscious Gen-Z women (18-24) in Tier-1 and Tier-2 cities. Competing with The Body Shop and Mamaearth, they crafted an emerging social media campaign focused on authenticity and interactivity.</p> <p>The campaign kicked off with Instagram Reels featuring 35 nano-influencers (1K-10K followers) sharing “no-filter” skincare routines using VibeSkin’s aloe-vera range. A #GlowNaturally Pact UGC contest rewarded sustainable packaging hacks with seed-embedded gift boxes. TikTok Duets enabled users to react to ingredient myths, while Instagram Live Q&A with dermatologists built trust. Emerging features included AI skin-analysis quizzes via Stories polls and shoppable AR filters for virtual product trials. WhatsApp Broadcasts sent personalized routine tips post-purchase.</p> <p>Outcomes: 950K impressions, 58K UGC posts, 41% e-commerce growth in 50 days. ROI via Google Analytics and affiliate links hit 3.2x, with 29% conversions from AR interactions. Issues: algorithm shifts reduced organic reach; some UGC lacked brand alignment.</p> <p>Questions -</p> <p>(a) Design a 3-phase social media campaign for VibeSkin incorporating emerging trends like AI quizzes and live shopping to launch a monsoon skincare line.</p> <p>(b) Elaborate VibeSkin’s nano-influencer and UGC approach. Propose two enhancements using content pillars and real-time analytics for a similar brand targeting college students.</p>	CO5	L6

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

2|M-77810

UNIT-III			
6.	Identify the approaches in International Performance Management.	CO3	L3
7.	Examine the objectives of compensation policies for a multinational firm.	CO4	L4
UNIT-IV			
8.	Simplify the meaning of Organizational Knowledge. Compare the differences between tacit and explicit knowledge.	CO4	L4
9.	Interpret the meaning of International Relations and assess the key issues in International Relations.	CO5	L5
SECTION-C			
10.	<p>Case Study</p> <p>MegaTools Ltd., a multinational company, operates factories in India and Thailand. In India, strong trade unions demanded fair wages and safety improvements. After negotiations, the company agreed to regular joint meetings with union representatives. In Thailand, where unions are weaker, MegaTools introduced individual contracts and performance bonuses to reduce interest in unionization. This led to criticism from global labor groups, who claimed the company was applying different standards in different countries. The situation shows how multinational firms often face varying levels of union influence and must manage industrial relations differently across countries.</p> <p>Questions</p> <p>(a) Interpret the reasons for MegaTools adopting different approaches to trade unions in India and Thailand?</p> <p>(b) Recommend the International HRM strategies that can help MegaTools maintain fair labor practices across countries?</p>	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.

Roll No.

Total No. of Pages: 2

Total No. of Questions: 10

MBA, Semester-4th
STRATEGIC HUMAN RESOURCE MANAGEMENT

Subject Code: MBA-934-18

M.Code: 77817

Date of Examination: 13-12-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of EIGHT questions carrying TWO marks each.
2. SECTION-B consists of FOUR subsections: Units-I, II, III & IV. Each subsection contains TWO questions, each carrying EIGHT marks each and student has to attempt any ONE question from each subsection.
3. SECTION-C is COMPULSORY and consists of ONE Case Study carrying TWELVE marks.

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define corporate-level HR strategy.	CO1	L1
b.	Explain Best Practice approach in SHRM.	CO1	L2
c.	Classify two components of the HR environment.	CO2	L2
d.	What is meant by strategic reward management?	CO3	L1
e.	Explain the purpose of global HR planning.	CO4	L2
f.	Define expatriate failure.	CO4	L1
g.	What is cross-cultural performance management?	CO5	L1
h.	Outline any two global employee relations challenges.	CO5	L2
SECTION-B			
UNIT-I			
2.	Apply how the concepts of internal and external analysis in SHRM.	CO1	L3
3.	Analyze the differences between traditional HR and strategic HR with real-world examples.	CO2	L4
UNIT-II			
4.	Utilise how HR strategy integrates with business strategy during organizational restructuring.	CO2	L3
5.	Determine the role of compensation and reward strategies in gaining competitive advantage.	CO3	L5
UNIT-III			
6.	Identify the behavioural challenges faced by employees during strategic transformations.	CO3	L3
7.	Analyze the contribution of talent management and retention strategies in strategy implementation.	CO4	L4

UNIT-IV			
8.	Compare ethnocentric, polycentric, region centric, and geocentric staffing approaches used in MNCs.	CO4	L4
9.	Critically evaluate expatriate challenges such as cultural adjustment, performance evaluation, and repatriation.	CO5	L5
SECTION-C			
10.	<p>Orion International, a US-based digital engineering company, has recently expanded into India, Singapore, Poland, and Germany to support its global client base. The company follows a blended staffing strategy by deploying expatriate managers while hiring a large local workforce. However, the expansion has created several HR challenges. Expatriates struggle with cultural differences related to communication styles, leadership expectations, teamwork norms, and workplace etiquette. Limited pre-departure training leaves them unprepared for local cultural and legal environments.</p> <p>Local employees feel that HR policies designed at the US headquarters do not align with regional labour laws, compensation norms, or career expectations, leading to rising turnover. Standardized global training modules fail to address varying skill requirements and language differences across the new regions. Additionally, compensation disparities between expatriates and local staff create perceptions of inequity and tension within teams. These issues threaten Orion's ability to build cohesive global operations.</p> <p>Questions:</p> <ol style="list-style-type: none"> a. Discuss the global HR challenges faced by Orion International during expansion. b. Create a global HR strategy addressing staffing, training, and compensation for Orion. 	CO5	L6

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

UNIT-III			
6.	Identify the relevance of KPI's in data visualization by citing example.	CO4	L3
7.	Examine the fundamentals of data modeling for analytics. How do conceptual, logical, and physical models support accurate analysis and reporting?	CO4	L4
UNIT-IV			
8.	Simplify the criteria for choosing an effective visual tool and provide examples of situations where different visual tools (charts, maps, infographics, dashboards) are most appropriate.	CO5	L4
9.	Justify how can data storytellers effectively focus the audience's attention? Explain various visual and narrative techniques used to guide audience perception.	CO6	L5
SECTION-C			
10.	<p>SecureLife Insurance Ltd., founded in 2003 in Maharashtra, gradually expanded nationwide, offering life, health, term, pension, and investment-linked insurance products. Between 2012 and 2018, it acquired several smaller insurers, resulting in a larger customer base and diversified portfolio. Today, the company operates through 600+ branches, employs 15,000 agents, and partners with numerous hospitals and financial institutions.</p> <p>SecureLife introduced digital services such as online policy purchases, mobile premium payments, and claim tracking. However, rapid expansion and digital adoption led to massive data generation from branches, online platforms, customer interactions, hospitals, and external agencies. Existing operational databases—meant only for daily transactions—could not support analytics or strategic decision-making.</p> <p>Issues included inconsistent and redundant data, slow report generation, fragmented systems, and lack of centralized insights for customer trends, policy performance, claim ratios, or fraud detection. Management realized that without a unified, cleansed, and historical data system, the company could not remain competitive. Thus, SecureLife decided to build a Data Warehouse to improve data quality, support business intelligence, and enable timely decisions.</p> <p>QUESTION:</p> <ol style="list-style-type: none"> Discuss the reasons why SecureLife Insurance Ltd. needed to build a Data Warehouse. Elaborate the suggestions would you give SecureLife Insurance Ltd. for successful implementation of the Data Warehouse? 	CO4	L6

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

UNIT-IV			
8.	Inspect the differences between long term forecast and short term forecast.	CO 4	L 4
9.	Explain an approach towards Composite Indexes.	CO 5	L 5
SECTION-C			
10.	<p>In this case, we needed to develop a model for forecasting weekly air passenger traffic on major domestic routes for one of Australia's leading airlines. The company required forecasts of passenger numbers for each major domestic route and for each class of passenger (economy class, business class and first class). The company provided weekly traffic data from the previous six years.</p> <p>Air passenger numbers are affected by school holidays, major sporting events, advertising campaigns, competition behavior, etc. School holidays often do not coincide in different Australian cities, and sporting events sometimes move from one city to another. During the period of the historical data, there was a major pilots' strike during which there was no traffic for several months. A new cut-price airline also launched and folded. Towards the end of the historical data, the airline had trialed a redistribution of some economy class seats to business class, and some business class seats to first class. After several months, however, the seat classifications reverted to the original distribution.</p>	CO 5	L 5
(a)	Based upon the above case study, evaluate the concept of revenue and profit of a firm is related with the estimation of demand.		

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

Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (Mechanical Engineering) Semester 5th

THEORY OF MACHINES-1

Subject Code: BTME 302-18

M.Code: 76418

Date of Examination:03-12-2025

Time: 3 Hrs.

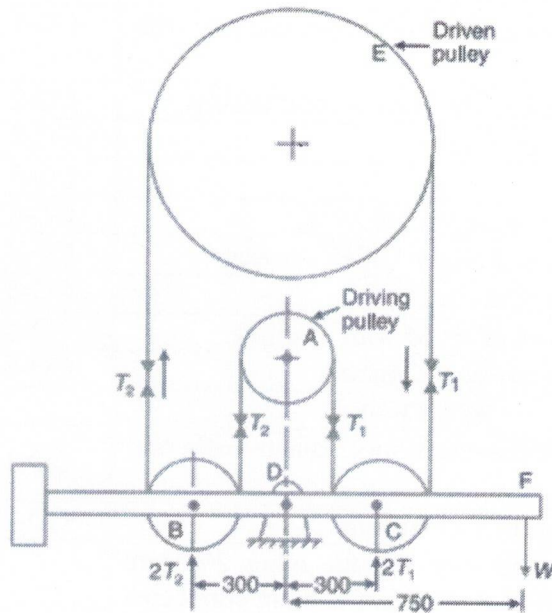
Max. Marks: 60

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.	List the different types of kinematic chains.	CO-1	L1
b.	Explain the difference between a link and a kinematic pair with one simple example.	CO-1	L2
c.	List the different types of higher pairs used in mechanisms.	CO-2	L1
d.	Explain the function of a universal joint.	CO-2	L2
e.	Define flat belt drive.	CO-3	L1
f.	Illustrate loose and fast pulley arrangement.	CO-3	L2
g.	Explain the term "displacement diagram" of a follower.	CO-4	L2
h.	Illustrate the function of a friction clutch.	CO-5	L2
i.	Illustrate concept of fluctuation of speed with example.	CO-6	L2
j.	Show construction of turning moment diagram.	CO-6	L1
SECTION-B			
2.	Construct inversions of a slider-crank mechanism with neat sketches.	CO-1	L3
3.	Analyze the polar diagram for Universal Joint.	CO-2	L4
4.	Two pulleys, one 450 mm diameter and the other 200 mm diameter are on parallel shafts 1.95 m apart and are connected by a crossed belt. Evaluate the length of the belt required and the angle of contact between the belt and each pulley. What power can be transmitted by the belt when the larger pulley rotates at 200 rev/min, if the maximum permissible tension in the belt is 1 kN, and the coefficient of friction between the belt and pulley is 0.25.	CO-3	L5
5.	Discuss the procedure to draw the displacement diagram for uniform velocity type motion of the follower.	CO-4	L6

6.	Build the expression for finding width and thickness of a flywheel.	CO-6	L3
SECTION-C			
7.	Construct various inversions of four-bar chain.	CO-1	L3
8.	Construct the cam profile for a clockwise cam of minimum radius 50 mm driving a knife-edge follower with: outstroke 40 mm in 100°, dwell 80°, return in 90°, dwell 90°. Make use of uniform acceleration and retardation on both strokes, with the follower line of stroke passing through the cam-shaft centre.	CO-4	L3
9.	<p>The essential features of a transmission dynamometer are shown in figure given below. A is the driving pulley which runs at 600 r.p.m. B and C are jockey pulleys mounted on a horizontal beam pivoted at D, about which point the complete beam is balanced when at rest. E is the driven pulley and all portions of the belt between the pulleys are vertical. A, B and C are each 300 mm diameter and the thickness and weight of the belt are neglected. The length DF is 750 mm. Estimate the following:</p> <p>(a) Value of the weight W to maintain the beam in a horizontal position when 4.5 kW is being transmitted, and</p> <p>(b) Value of weight W, when the belt just begins to slip on pulley A. The coefficient of friction being 0.2 and maximum tension in the belt 1.5 kN.</p>	CO-5	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 (Mechanical Engineering), Semester 5th

DESIGN OF MACHINE ELEMENTS

Subject Code: BTME-502-18

M.Code: 78248

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.	Name different modes of failure in machine design.	CO-1	L1
b.	Classify the different types of stresses with examples.	CO-1	L2
c.	What is the condition for designing of a shaft under combined bending and torsion?	CO-2	L1
d.	Classify the types of fatigue loading with examples.	CO-2	L2
e.	Define flat belt drive.	CO-3	L1
f.	Show the cross-section of a V-belt and label its important parts.	CO-3	L2
g.	Explain the difference between spur and helical gears.	CO-4	L2
h.	Explain the function of centrifugal clutch.	CO-5	L2
i.	Contrast the difference between tension and compression springs.	CO-6	L2
j.	List the types of springs used in machines.	CO-6	L1
SECTION-B			
2.	Apply the design steps to develop a systematic procedure for a machine element.	CO-1	L3
3.	A solid circular shaft is subjected to a bending moment of 3000 N-m and a torque of 10 000 N-m. The shaft is made of 45 C 8 steel having ultimate tensile stress of 700 MPa and an ultimate shear stress of 500 MPa. Assuming a factor of safety as 6, determine the diameter of the shaft.	CO-2	L4
4.	An engine shaft running at 120 r.p.m. is required to drive a machine shaft by means of a belt. The pulley on the engine shaft is of 2 m diameter and that of the machine shaft is 1 m diameter. If the belt thickness is 5 mm; determine the speed of the	CO-3	L5

	machine shaft, when (a) there is no slip; and (b) there is a slip of 3%.		
5.	Discuss the design procedure to prepare the layout of helical for given velocity ratio.	CO-4	L6
6.	Make use of strength equations to design a flexible coupling.	CO-6	L3
SECTION-C			
7.	A steel connecting rod is subjected to a completely reversed axial load of 160 kN. Suggest the suitable diameter of the rod using a factor of safety 2. The ultimate tensile strength of the material is 1100 MPa, and yield strength 930 MPa. Neglect column action and the effect of stress concentration.	CO-1	L3
8.	Design a spur gear drive required to transmit 45 kW at a pinion speed of 800 r.p.m. The velocity ratio is 3.5: 1. The teeth are 20° full-depth involute with 18 teeth on the pinion. Both the pinion and gear are made of steel with a maximum safe static stress of 180 MPa. Assume a safe stress of 40 MPa for the material of the shaft and key.	CO-4	L3
9.	Select a single-row deep groove ball bearing, for a shaft that is 75 mm in diameter and which rotates at 125 rpm. The bearing is subjected to a radial load of 21 kN and there is no thrust load. The expected life of the bearing is 10,000 hours.	CO-5	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: 01

Total No. of Questions: 09

B.Tech (MECHANICAL ENGINEERING), Semester 5TH

MANAGEMENT AND ENGINEERING ECONOMICS

Subject Code: BTME-504-18

M.Code: 78250

Date of Examination: 22-11-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What are the early management approaches?	CO-1	L1
b.	Explain the importance of planning.	CO-1	L2
c.	Define Nature and purpose of organization.	CO-2	L1
d.	Classify various types of organization.	CO-2	L2
e.	List the principles of organization.	CO-3	L1
f.	Explain the purpose of departmentation.	CO-3	L2
g.	Explain the term demand and supply.	CO-4	L2
h.	Explain the term future worth.	CO-5	L2
i.	What are the methods of revenue dominated cash flow?	CO-6	L2
j.	What is meant by assets with unequal lives?	CO-6	L1
SECTION-B			
2.	Identify the various types of plans in an organization.	CO-1	L3
3.	Compare MBO and MBE.	CO-2	L4
4.	Explain the process of recruitment and selection.	CO-3	L5
5.	Discuss price elasticity and income elasticity with examples.	CO-4	L6
6.	Apply the role of taxation in determining product cost and profitability.	CO-6	L3
SECTION-C			
7.	Identify the assumptions of Douglas Mc-Gregor's Theory X and Theory Y and compare Theory X and Theory Y.	CO-1	L3
8.	Identify the scope, significance and applications of Engineering economics in problem solving and decision making.	CO-4	L3

9.	Explain the procedure, advantages and limitations of payback period with examples.	CO-5	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 (Mechanical Engineering), Semester 5th

MANUFACTURING PROCESSES

Subject Code: BTME-503-18

M. Code: 78249

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.	What is forging? Write the applications of forging.	CO-1	L1
b.	Explain the working principle of metal forming process.	CO-1	L2
c.	Define knurling operation.	CO-2	L1
d.	Illustrate the factors affecting machining.	CO-2	L2
e.	How does additive manufacturing compare to traditional manufacturing methods?	CO-3	L1
f.	Compare direct and indirect rapid tooling.	CO-3	L2
g.	Explain the principle of ultrasonic welding.	CO-4	L2
h.	Outline some of the tool material used in EDM.	CO-5	L2
i.	Compare die and punch.	CO-6	L2
j.	What is the purpose of an indexing fixture?	CO-6	L1
SECTION-B			
2.	Construct a sketch for tube drawing operation and explain how tube is drawn? Write few applications.	CO-1	L3
3.	Distinguish between up milling and down milling with a neat sketch.	CO-2	L4
4.	Evaluate the role of material used in additive manufacturing. Give some examples of commonly used materials.	CO-3	L5
5.	Compare Solid state and liquid state welding process. Explain the Friction welding process in detail with a neat sketch.	CO-4	L5

6.	Utilize the principles of design and explain the procedure for design of die and punch.	CO-6	L3
SECTION-C			
7.	Utilize centrifugal principle and explain centrifugal casting process with a suitable diagram. Also, write its applications, advantages and disadvantages.	CO-1	L3
8.	Examine in detail about MIG welding process with neat sketch. What are the merits and demerits? Write its applications.	CO-4	L4
9.	Explain the principle and working of a USM with a neat sketch. List the advantages, limitations and applications of USM. Discuss about the control of quality in machining in USM.	CO-5	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 (Mechanical Engineering) Semester 5th

HEAT TRANSFER

Subject Code: BTME-501-18

M.Code: 78247

Date of Examination: 17-11-2025

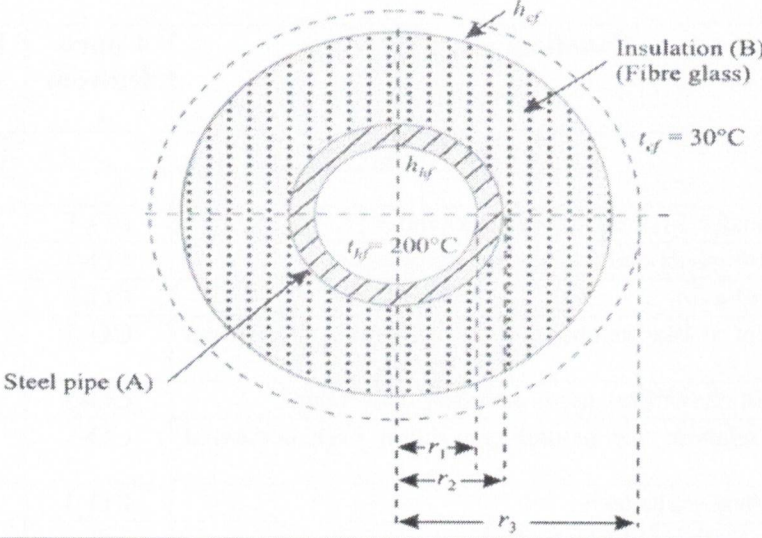
Time: 3 Hrs.

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.	How does heat transfer differ from thermodynamics?	CO-1	L1
b.	Explain thermal diffusivity and its physical significance.	CO-1	L2
c.	Define efficiency of a fin.	CO-2	L1
d.	Explain the concept of Biot number and its significance in transient conduction.	CO-2	L2
e.	What are the conditions of flow used to classify convection?	CO-3	L1
f.	Show empirical relations for natural convection over horizontal plates.	CO-3	L2
g.	Define fouling in heat exchangers.	CO-4	L1
h.	Compare nucleate boiling and film boiling.	CO-4	L2
i.	How do you define the emissivity of a body?	CO-5	L1
j.	Illustrate the concept of Stefan-Boltzmann's law of radiation.	CO-5	L2
SECTION-B			
2.	A furnace wall consists of three layers: an inner layer of fire brick that is 13.5 cm thick, a middle layer of insulating brick that is 7.5 cm thick, and an outer layer of red brick that is 11.5 cm thick. The furnace operates at a temperature of 870°C, and it is anticipated that the outside surface of the composite wall can be maintained at 40°C by air circulation. Assuming there is close bonding between the layers at their interfaces, solve the rate of heat loss from the furnace and the temperature at the interface between the brick layers. The overall dimensions of the wall are 5 meters by 2 meters. The thermal conductivities of the materials are as follows: Fire brick (k_1): 1.2 W/m·°C, Insulating brick (k_2): 0.14 W/m·°C, Red brick (k_3): 0.85 W/m·°C	CO-1	L4
3.	Apply the concept of fin to solve the equation for effectiveness of a fin.	CO-2	L3

4.	Prove Buckingham Pi theorem with an example related to convection heat transfer.	CO-3	L5
5.	Identify the factors affecting nucleate boiling.	CO-4	L3
6.	Explain the concept of total emissive power and monochromatic emissive power.	CO-5	L5
SECTION-C			
7.	<p>Examine the overall heat transfer coefficient (based on inner diameter) for a steel pipe covered with fiber glass insulation. The following are the data given:</p> <p>Inner diameter of pipe = 2 cm Thickness of pipe = 0.2 cm Thickness of insulation = 2 cm Heat transfer coefficient = 10 W/m²K Heat transfer coefficient = 5 W/m²K conductivity of insulation = 0.05 W/mK conductivity of steel = 46 W/mK Inside fluid temperature = 200°C Ambient temperature = 30°C Also find net heat loss from the pipe</p> 	CO-1	L3
8.	Analyze and derive momentum equation for hydrodynamic boundary layer over a flat plate.	CO-3	L4
9.	Explain different boiling regimes and their heat transfer characteristics in detail.	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 Questions: 09

Total No. of Pages: 02

B.Tech (Mechanical Engineering), Semester- 6th

AUTOMOBILE ENGINEERING

Subject Code: BTME 603-18

M.Code: 79652

Date of Examination: 22-11-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What is the function of Turbochargers?	CO1	L1
b.	How we can control the emission by 3-way catalytic converter system	CO1	L1
c.	Illustrate the function of Common Rail fuel supply system.	CO2	L2
d.	What is the function of shock absorber?	CO3	L1
e.	What is dependent suspension system?	CO3	L1
f.	Illustrate the function of multiplate clutch.	CO4	L2
g.	Explain the term ESP.	CO5	L2
h.	Explain the need of wheel alignment.	CO3	L2
i.	What is meant by ABS and EBD in automobile safety systems?	CO5	L1
j.	Explain the major factors that influence tyre life.	CO6	L2
SECTION-B			
2.	Assess how engine parameters such as compression ratio, air-fuel ratio, and ignition timing influence the fuel economy of an automobile.	CO1	L5
3.	Evaluate the effect of exhaust gas recirculation (EGR) and catalytic converter on overall vehicle emission and fuel economy.	CO1	L3
4.	Apply your knowledge to explain the working principle of an independent suspension system and its effect on ride comfort and handling stability.	CO3	L3
5.	Analyze the role and working of active safety systems such as ABS and ESP in improving vehicle stability and safety during braking.	CO5	L4

6.	Analyze the use of hybrid vehicle technology in reducing emissions and improving energy efficiency compared to conventional fuel-based systems.	CO5	L4
SECTION-C			
7.	Evaluate the fuel injection systems (MPFI, CRDI, GDI) used in modern vehicles and justify their use over carburetion systems	CO2	L5
8.	Identify the merits and demerits of AT, AMT, CVT, DCT/DSG automatic transmission system.	CO4	L3
9.	Assess the common causes of vehicle engine failure and evaluate appropriate troubleshooting and preventive maintenance practices to enhance service life and reliability.	CO6	L5

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

Roll No.

Total No. of Questions: 09

Total No. of Pages: 02

B.Tech (Mechanical Engineering), Semester- 6th

AUTOMOBILE ENGINEERING

Subject Code: BTME 603-18

M.Code: 79652

Date of Examination: 22-11-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What is the function of Turbochargers?	CO1	L1
b.	How we can control the emission by 3-way catalytic converter system	CO1	L1
c.	Illustrate the function of Common Rail fuel supply system.	CO2	L2
d.	What is the function of shock absorber?	CO3	L1
e.	What is dependent suspension system?	CO3	L1
f.	Illustrate the function of multiplate clutch.	CO4	L2
g.	Explain the term ESP.	CO5	L2
h.	Explain the need of wheel alignment.	CO3	L2
i.	What is meant by ABS and EBD in automobile safety systems?	CO5	L1
j.	Explain the major factors that influence tyre life.	CO6	L2
SECTION-B			
2.	Assess how engine parameters such as compression ratio, air-fuel ratio, and ignition timing influence the fuel economy of an automobile.	CO1	L5
3.	Evaluate the effect of exhaust gas recirculation (EGR) and catalytic converter on overall vehicle emission and fuel economy.	CO1	L3
4.	Apply your knowledge to explain the working principle of an independent suspension system and its effect on ride comfort and handling stability.	CO3	L3
5.	Analyze the role and working of active safety systems such as ABS and ESP in improving vehicle stability and safety during braking.	CO5	L4

6.	Analyze the use of hybrid vehicle technology in reducing emissions and improving energy efficiency compared to conventional fuel-based systems.	CO5	L4
SECTION-C			
7.	Evaluate the fuel injection systems (MPFI, CRDI, GDI) used in modern vehicles and justify their use over carburetion systems	CO2	L5
8.	Identify the merits and demerits of AT, AMT, CVT, DCT/DSG automatic transmission system.	CO4	L3
9.	Assess the common causes of vehicle engine failure and evaluate appropriate troubleshooting and preventive maintenance practices to enhance service life and reliability.	CO6	L5

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

Roll No.

Total No. of Questions: 09

Total No. of Pages: 02

B.Tech (Mechanical Engineering), Semester - 6th
INTRODUCTION TO INDUSTRIAL MANAGEMENT

Subject Code: BTME-604-18

M.Code:79653

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.			
a.	Define the role of industrial engineer in industry?	CO1	L1
b.	Define factor of excellence.	CO1	L1
c.	Explain the various applications of industrial engineering	CO1	L2
d.	Interpret the reasons for choosing industrial engineering as a field of study.	CO1	L2
e.	Define production and productivity.	CO2	L1
f.	Explain the main objectives of product design.	CO3	L2
g.	List the objectives of purchasing.	CO4	L1
h.	Define role of marketing in detail.	CO5	L1
i.	Define customer satisfaction.	CO5	L1
j.	Explain the different types of consumers.	CO5	L2
SECTION-B			
2.	Identify how industrial engineering helps in enhancing industrial productivity in the present competitive and dynamic environment.	CO1	L3
3.	Analyze the key elements of Total Quality Management (TQM) and evaluate its significance.	CO2	L4
4.	Evaluate the applications of industrial engineering principles in context to the growth, performance, and competitive advantages of an industry.	CO3	L5

5.	Analyze the concept and utility of ABC analysis as applied to inventory.	CO4	L4
6.	Identify and explain the various quality tools used to control the quality of product.	CO5	L3
SECTION-C			
7.	Analyze the concept of quality assurance and examine its advantages in ensuring product reliability and organizational effectiveness.	CO2	L4
8.	Evaluate the effectiveness of preventive, predictive, scheduled, and breakdown maintenance strategies, and justify which maintenance approach is most suitable for achieving long-term operational efficiency in an industry.	CO3	L5
9.	Evaluate how purchasing practices differ between the service and manufacturing industries.	CO4	L5

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

Roll No.

Total No. of Questions: 09

Total No. of Pages: 02

B.Tech (Mechanical Engineering), Semester- 6th

COMPUTER AIDED DESIGN

Subject Code: BTME 613-18

M.Code: 79658

Date of Examination: 04-12-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Name various types of equations used in geometric modeling.	CO1	L1
b.	Define explicit and implicit equations with examples.	CO1	L1
c.	Summarize the advantages of parametric modeling in CAD applications.	CO1	L2
d.	Define solid modeling.	CO3	L1
e.	Explain the role of parameterized shapes in solid modeling.	CO3	L2
f.	List different types of 2D and 3D transformations.	CO4	L1
g.	Illustrate the function of homogeneous coordinates in transformations.	CO4	L2
h.	Explain scaling in geometric transformation?	CO4	L2
i.	List the main components of an assembly model in CAD.	CO5	L1
j.	Outline the different types of assembly constraints used in CAD software.	CO5	L2
SECTION-B			
2.	Apply the concept of explicit and implicit equations and explain their roles in geometric modeling.	CO1	L3
3.	Make use of coordinate transformations to describe how objects are represented in different orientations.	CO1	L3

4.	Compare different solid representation schemes like B-rep, CSG, and sweep representation.	CO3	L4
5.	Assess the importance of topology and geometry integration for accurate solid modeling in CAD systems.	CO3	L5
6.	Compare Bezier and B-spline curves.	CO2	L4
SECTION-C			
7.	Evaluate different curve modeling techniques (Bezier, B-spline and NURBS) and justify the best method for freeform design.	CO2	L5
8.	Apply scaling transformations to describe how object dimensions are modified in CAD.	CO4	L3
9.	Assess the advantages of using top-down assembly design in large and complex products.	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.

Roll No.

Total No. of Questions: 09

Total No. of Pages: 02

B.Tech (Mechanical Engineering), Semester- 6th
NON-CONVENTIONAL ENERGY RESOURCES

Subject Code: BTME 615-18

M.Code: 79660

Date of Examination: 04-12-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer Briefly:		
a.	Define renewable energy sources. Give its advantages	CO1	L1
b.	Classify the energy sources.	CO1	L2
c.	What are solar greenhouses?	CO2	L1
d.	Explain solar constant.	CO2	L2
e.	What is the basic principle of wind energy conversion?	CO3	L1
f.	What are thermoelectric materials?	CO3	L1
g.	Explain geothermal source.	CO3	L2
h.	Outline the source of geothermal energy.	CO3	L2
i.	What is meant by anaerobic digestion?	CO4	L1
j.	Explain the conversion process of Biomass.	CO4	L2

SECTION-B

2.	Analyze the main strategies for meeting the future energy requirements.	CO1	L4
3.	Identify the different applications of solar energy.	CO2	L3
4.	List the various factors that must be considered during the selection of wind mills.	CO3	L4
5.	Explain the main sources of geothermal energy.	CO3	L5
6.	Make use of real-world examples to illustrate how aero-generators convert wind energy into electrical power.	CO4	L3
SECTION-C			
7.	Explain in detail the availability and growth of renewable and non-renewable energy sources in India.	CO1	L5
8.	List different methods to store solar energy. Explain any two in detail.	CO2	L4
9.	Explain different methods of obtaining energy from biomass.	CO4	L5

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

Roll No.

Total No. of Questions: 09

Total No. of Pages: 02

B.Tech (Mechanical Engineering), Semester- 6th
MECHANICAL MEASUREMENTS AND METROLOGY
Subject Code: BTME-602-18

M.Code: 79651

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.	What are static performance characteristics?	(CO1)	L-1
b.	Explain Linearity.	(CO2)	L-2
c.	What is meant by Wringing?	(CO2)	L-1
d.	What is feeler gauge?	(CO2)	L-1
e.	Define hysteresis in instruments.	(CO1)	L-1
f.	Compare range and span.	(CO1)	L-2
g.	Explain Pressure Thermometers with diagram.	(CO4)	L-2
h.	Compare roughness and waviness with suitable diagram.	(CO5)	L-2
i.	What are line standards?	(CO2)	L-1
j.	Explain the use of interferometry.	(CO6)	L-2
SECTION-B			
2.	Explain the construction and working of Profile projector,	(CO6)	L-5
3.	Construct the block diagram of the generalized measuring system and explain its various elements.	(CO1)	L-3
4.	Analyze the function various types of electrical strain gauge with neat sketches.	(CO2)	L-4
5.	Construct Tool maker's microscope with an appropriate diagram and explain its various elements.	(CO6)	L-3
6.	Examine the working principle of variable resistance and inductance transducers.	(CO3)	L-4

SECTION-C			
7.	Construct a neat sketch and working principle of piezo-electric transducer and photo cells.	(CO3)	L-3
8.	Discuss in detail the different temperature measurement devices and their calibration methods.	(CO4)	L-6
9.	Explain with neat diagrams, various methods of measuring I. Tooth thickness II. Pitch	(CO5)	L-5

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

Roll No.

Total No. of Questions: 09

Total No. of Pages: 02

B.Tech (Mechanical Engineering), Semester- 6th

AUTOMOBILE ENGINEERING

Subject Code: BTME 603-18

M.Code: 79652

Date of Examination: 22-11-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	What is the function of Turbochargers?	CO1	L1
b.	How we can control the emission by 3-way catalytic converter system	CO1	L1
c.	Illustrate the function of Common Rail fuel supply system.	CO2	L2
d.	What is the function of shock absorber?	CO3	L1
e.	What is dependent suspension system?	CO3	L1
f.	Illustrate the function of multiplate clutch.	CO4	L2
g.	Explain the term ESP.	CO5	L2
h.	Explain the need of wheel alignment.	CO3	L2
i.	What is meant by ABS and EBD in automobile safety systems?	CO5	L1
j.	Explain the major factors that influence tyre life.	CO6	L2
SECTION-B			
2.	Assess how engine parameters such as compression ratio, air-fuel ratio, and ignition timing influence the fuel economy of an automobile.	CO1	L5
3.	Evaluate the effect of exhaust gas recirculation (EGR) and catalytic converter on overall vehicle emission and fuel economy.	CO1	L3
4.	Apply your knowledge to explain the working principle of an independent suspension system and its effect on ride comfort and handling stability.	CO3	L3
5.	Analyze the role and working of active safety systems such as ABS and ESP in improving vehicle stability and safety during braking.	CO5	L4

6.	Analyze the use of hybrid vehicle technology in reducing emissions and improving energy efficiency compared to conventional fuel-based systems.	CO5	L4
SECTION-C			
7.	Evaluate the fuel injection systems (MPFI, CRDI, GDI) used in modern vehicles and justify their use over carburetion systems	CO2	L5
8.	Identify the merits and demerits of AT, AMT, CVT, DCT/DSG automatic transmission system.	CO4	L3
9.	Assess the common causes of vehicle engine failure and evaluate appropriate troubleshooting and preventive maintenance practices to enhance service life and reliability.	CO6	L5

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

Roll No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Total No. of Questions: 09

Total No. of Pages: 02

B.Tech (Mechanical Engineering), Semester- 6th
REFRIGERATION AND AIR CONDITIONING

Subject Code: BTME 601-18

M.Code: 79650

Date of Examination: 17-11-2025

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

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

Q. No.	Question	Course Outcome	Bloom's Level
SECTION-A			
1.	Answer briefly:		
a.	Define C.O.P of refrigerator.	CO1	L1
b.	List the various types of condensers.	CO1	L1
c.	Illustrate the function of Flash Chamber.	CO2	L2
d.	What are zeotropes? Give two examples.	CO3	L1
e.	List any two secondary refrigerants and discuss its importance.	CO3	L1
f.	Illustrate the function of generator and absorber in vapour absorption refrigeration system	CO4	L2
g.	Explain the term bypass factor of a cooling coil.	CO5	L2
h.	Outline the key reasons responsible for the global discontinuation of CFCs as refrigerants.	CO3	L2
i.	What do you mean by Humidity and Degree of Saturation?	CO5	L1
j.	Explain the various sources of heat load.	CO6	L2
SECTION-B			
2.	Determine the coefficient of performance of Carnot refrigeration cycle absorbing heat at 270 K and rejecting it at 300 K. (i) If the cycle is absorbing 1130 kJ/min at 270 K, how many kJ of work is required per second? (ii) If the Carnot heat pump operates between the same temperatures as the above refrigeration cycle, what is the coefficient of performance? (iii) How many kJ/min will the heat pump deliver at 300 K if it absorbs 1130 kJ/min at 270 K.	CO1	L5

3.	Construct hermetically sealed compressor and explain its working principle.	CO1	L3
4.	Identify various eco-friendly refrigerants used in today's refrigeration systems and action plan to reduce ecological hazards.	CO3	L3
5.	Assume that the atmospheric air at 30°C dry bulb temperature and 75% relative humidity enters a cooling coil at the rate of 200 m ³ /min. The coil dew point temperature is 14°C and the by-pass factor of the coil is 0.1. Determine the temperature of air leaving the cooling coil, the capacity of the cooling coil in tonnes of refrigeration, and the sensible heat factor for the process.	CO5	L4
6.	Distinguish between dry bulb, wet bulb, and dew point temperatures. How are these properties measured and represented on a psychrometric chart ?	CO5	L4
SECTION-C			
7.	Determine power, heat transferred to cylinder water jacket, piston displacement, heat transfer in condenser and coefficient of performance of a simple ammonia-compression system operating with a capacity of 250 tonnes. The condensation temperature in the condenser is 35°C. The evaporation temperature in brine cooler is -25°C. The ammonia leaves the evaporator and enters the compressor at -8°C. The ammonia enters the expansion valve at 30°C. Wire drawing through the compressor valves: Suction = 0.118 bar ; Discharge = 0.23 bar ; Compression index = 1.22 ; Volumetric efficiency = 0.75	CO2	L5
8.	Construct Lithium Bromide Refrigeration System and explain its working.	CO4	L3
9.	Estimate the performance variables of the office air conditioning system for 25 occupants based on the following data. Outside design conditions: 34°C DBT, 28°C WBT Inside design conditions: 24°C DBT, 50% RH Solar heat gain: 9120 W Latent heat gain per occupant: 105 W Sensible heat gain per occupant: 90 W Lightening load: 2300 W Sensible heat load from other sources: 11630 W Infiltration load: 14 m ³ /min Assuming 40% fresh air and 60% of recirculated air passing through the evaporator coil and the by-pass factor of 0.15, find the dew point temperature of the coil and capacity of the plant.	CO6	L6

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

Roll No.

Total No. of Pages: 02

Total No. of Questions: 09

B.Tech (Mechanical Engineering), Semester 7th

AUTOMATION IN MANUFACTURING

Subject Code: BTME702-18

M.Code: 90475

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.	Define automation in the manufacturing industry.	CO-1	L1
b.	Interpret the role of automation in improving quality and accuracy.	CO-1	L2
c.	Define an automated system.	CO-2	L1
d.	Explain the working principle of an automated system with an example.	CO-2	L2
e.	Define data acquisition in automated systems.	CO-3	L1
f.	Explain the working principle of a pressure sensor.	CO-3	L2
g.	Define a ball screw.	CO-4	L1
h.	Compare hydraulic and pneumatic systems in terms of pressure and speed.	CO-4	L2
i.	Define a hydraulic power pack.	CO-5	L1
j.	Explain the working principle of a gear pump.	CO-5	L2
SECTION-B			
2.	Construct an example of automation in packaging industries.	CO-1	L3
3.	Analyze the limitations of fabricating components vs. purchasing standard ones.	CO-2	L4
4.	Explain the selection process of motor for particular applications.	CO-3	L5
5.	Construct a diagram showing tool magazine arrangement in machining centers.	CO-4	L3
6.	Explain the hydraulic circuit used to operate a double-acting cylinder.	CO-5	L5

SECTION-C			
7.	Make use of mechatronic principles to automate an assembly line.	CO-1	L3
8.	Categorize electrical drives based on their control method (open-loop, closed-loop).	CO-3	L4
9.	Explain computer integrated manufacturing in detail with block diagram	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 (ME), Semester 7th
ELECTRONIC DEVICES
 Subject Code: BTEC-301-18
 M.Code: 90606

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.	What is resistivity in semiconductors?	CO-1	L1
b.	Summarize quantum mechanics.	CO-1	L2
c.	Interpret any two factors affecting resistivity of a semiconductor.	CO-1	L2
d.	What is Avalanche breakdown?	CO-2	L1
e.	Illustrate the role of depletion region in diode operation.	CO-2	L2
f.	Outline the process of diffusion in PN junction diode.	CO-2	L2
g.	List and label the terminals of BJT symbol.	CO-3	L1
h.	Illustrate the output characteristics of CE configuration.	CO-3	L2
i.	Define oxidation in fabrication.	CO-4	L1
j.	Illustrate photolithography process.	CO-4	L2
SECTION-B			
2.	Compare the properties of semiconductors, and conductors using energy band diagrams.	CO-1	L4
3.	Identify the function of a Zener diode along with its I-V characteristics.	CO-2	L3
4.	For a transistor, $\beta = 45$ and voltage drop across $1\text{k}\Omega$ which is connected in the collector circuit is 1 volt. Find the base current for common emitter connection.	CO-3	L5

5.	List the major processes etching involved in fabrication of an IC.	CO-4	L4
6.	Compare diffusion and ion implantation methods in IC fabrication.	CO-4	L5
SECTION-C			
7.	Analyze along with suitable diagram how doping concentration modifies conductivity of a. p- type semiconductor. b. n-type semiconductor.	CO-1	L4
8.	Examine with suitable diagram the input and output characteristics of common base configuration of BJT.	CO-3	L4
9.	Interpret the concept of annealing. Why it is required in IC fabrication process?	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 Questions: 09

Total No. of Pages: 02

B.Tech (Mechanical Engineering), Semester-7th

MAINTENANCE AND RELIABILITY

Subject Code: BTME 617-18

M.Code: 90485

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.	Define maintenance scheduling.	CO-1	L1
b.	Interpret the term emergency maintenance.	CO-1	L2
c.	What are the objectives of total productive maintenance?	CO-2	L1
d.	Compare preventive and predictive maintenance policies.	CO-2	L2
e.	List requirements of service equipment.	CO-3	L1
f.	Explain the methods for analyzing component reliability.	CO-3	L2
g.	What do you mean by series and parallel systems.	CO-4	L1
h.	Classify system reliability models used in industry.	CO-4	L2
i.	What is the significance of fault tree analysis?	CO-5	L1
j.	Outline commonly used logical gates in fault tree diagrams.	CO-5	L2
SECTION-B			
2.	Examine the role of effective maintenance planning in minimizing equipment downtime and improving overall plant efficiency.	CO-1	L4
3.	Identify the effect of incentive payments on maintenance productivity.	CO-2	L3
4.	Estimate life of a machine part by using reliability concept.	CO-3	L5
5.	Categorize types of redundancy used in industrial systems.	CO-4	L4

6.	Explain how Fault Tree Analysis (FTA) helps in improving the reliability and safety of an industrial system.	CO-5	L5
SECTION-C			
7.	Explain various factors that influence the selection of an appropriate maintenance strategy in an industry.	CO-1	L4
8.	Examine the methods utilized in preventive and corrective lubrication and also compare them in terms of reliability.	CO-3	L4
9.	Explain the possible causes of bearing failure and recommend appropriate corrective measures.	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 (Mechanical Engineering), Semester 7th

PRODUCT DESIGN AND DEVELOPMENT

Subject Code: - BTME614-18

M.Code: 90482

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 essential factors of product design.	CO-1	L1
b.	Classify the role of tolerances in detailed design.	CO-1	L2
c.	When is a product considered aesthetically successful?	CO-2	L1
d.	Explain the importance of basic design considerations.	CO-2	L2
e.	Define the role of the process engineer in product design.	CO-3	L1
f.	Explain the steps for designing a powder metallurgical part.	CO-3	L2
g.	Which economic factor affects competitiveness the most?	CO-4	L1
h.	Classify environmental factors that influence product design.	CO-4	L2
i.	What is the main objective of rapid prototyping?	CO-5	L1
j.	Classify the advantages of RP in product development..	CO-5	L2
SECTION-B			
2.	Analyze how design evolution can lead to innovation through continuous improvement, citing a real-world product example.	CO-1	L4
3.	Develop the aesthetic features of a consumer electronics product.	CO-2	L3
4.	Explain design choices that improve handling during production.	CO-3	L5
5.	Analyze the relationship between manufacturing efficiency, product reliability and profitability in modern design approaches.	CO-4	L4

6.	Explain common Rapid Prototyping defects and their causes.	CO-5	L5
SECTION-C			
7.	Analyze how essential factors collectively determine product success in competitive markets.	CO-1	L4
8.	Discuss design changes for an automotive casting process to improve productivity and reduce defects.	CO-3	L6
9.	Determine the role of economic analysis in guiding product design decisions.	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 (Mechanical Engineering), Semester 7th

MECHANICAL VIBRATIONS

Subject Code: -BTME 701-18

M.Code: -90474

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.	What is natural frequency?	CO-1	L1
b.	Illustrate the concept of beats in vibrations.	CO-1	L2
c.	Define forced vibration.	CO-2	L1
d.	Demonstrate vibration response under reciprocating unbalance.	CO-2	L2
e.	What is meant by principal mode of vibration?	CO-3	L1
f.	Illustrate a double pendulum with sketch.	CO-3	L2
g.	What is meant by influence coefficient?	CO-4	L1
h.	Demonstrate torsional vibration of circular shafts.	CO-4	L2
i.	Recall Holzer's method of vibration analysis.	CO-5	L1
j.	Demonstrate Rayleigh-Ritz method with an example system.	CO-5	L2
SECTION-B			
2.	Categorize vibration systems based on degree of freedom.	CO-1	L4
3.	Apply forced vibration analysis to a reciprocating unbalance system.	CO-2	L3
4.	Compare vibration absorber and vibration isolator.	CO-3	L5
5.	Examine gear system vibrations due to tooth stiffness.	CO-4	L4
6.	Compare Dunkerley's and Stodola methods.	CO-5	L5
SECTION-C			
7.	Analyze the damping factor of a vibrating system which consists of a mass of 3.5 kg, spring stiffness 2.5 N/mm and a damper of damping coefficient 0.018 N/mm/s. What is the natural frequency of damped vibration?	CO-1	L4

8.	Examine the role of absorbers, isolators and dampers for engine systems in detail.	CO-3	L4
9.	Prioritize among longitudinal, torsional, and gear vibration problems for industry.	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 (Mechanical Engineering), Semester 7th
FUNDAMENTALS OF MANAGEMENT FOR ENGINEERS

Subject Code: BTME703-18

M.Code: 90476

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.	List two challenges of management in modern times.	CO-1	L1
b.	Illustrate the relationship between planning and controlling.	CO-1	L2
c.	Label the basic steps of Six Sigma.	CO-2	L1
d.	Show how TQM contributes to customer satisfaction.	CO-2	L2
e.	List two types of marketing.	CO-3	L1
f.	Illustrate how segmentation improves targeting of customers.	CO-3	L2
g.	Demonstrate the application of Therbligs in method improvement.	CO-4	L2
h.	Classify different types of productivity measures.	CO-5	L2
i.	Interpret the need of safety engineering in industries.	CO-6	L2
j.	List any two aims of personnel management.	CO-6	L1
SECTION-B			
2.	Develop a plan to improve managerial skills in a growing organization.	CO-1	L3
3.	Develop a quality improvement plan using TQM principles.	CO-2	L3
4.	Compare supply chain management with traditional distribution.	CO-3	L5
5.	Analyze the reasons for low productivity in manufacturing industries.	CO-4	L5
6.	Compare safety engineering principles with personnel management practices.	CO-6	L4

SECTION-C			
7.	Compare the stages of a product life cycle and conclude effective strategies at maturity stage.	CO-3	L4
8.	Construct a process chart for a packaging unit and assess its effectiveness.	CO-4	L3
9.	Develop a new productivity-enhancement framework blending value engineering and lean methods.	CO-5	L6

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