MJCET-R25

QP Code: 26A02D51413

Muffakham Jah College of Engineering and Technology

Mount Pleasant, 8-2-249 to 267, Road No. 3, Banjara Hills, Hyderabad -34
(UGC Autonomous Institution under Osmania University)

B.E. II-Semester (Regular) Examination, July 2026

Subject: Differential Equations & Numerical Methods

(Common to CE, CSE, ECE, ME, CSE (AI&ML), CSE (DS) and CSE (AI))

Time: 03 hours **Max. Marks: 60**

Note:
1. The question paper comprises Part A and Part B.
2. Part A is compulsory which carries 20 marks.
3. Part B consists of eight questions. Each question carries 08 marks. Answer any five questions.
4. Missing data, if any, maybe suitably assumed.

PART-A

(Answer All the questions. Each question carries 2 Marks) **(10×2 = 20 Marks)**

Q. No.	Questions	Marks	CO	BTL
1.	Solve $2xydy - (x^2 - y^2 + 1)dx = 0$	2	1	L2
2.	Find general solution of $y = xy' + (y')^2$	2	1	L1
3.	Solve $(D^3 + 1)y = 0$	2	2	L2
4.	Solve $(D^2 + 3D + 2)y = e^{2x}$	2	2	L2
5.	If $\bar{f} = (x + 3y)i + (y - 2z)j + (x + pz)k$ is Solenoidal, Find p.	2	3	L2
6.	Find $grad(r^n)$ *where* $\vec{r} = xi + yj + zk$	2	3	L2
7.	Write Newton-Raphson's formula.	2	4	L1
8.	Write Newton's Backward interpolation formula.	2	4	L1
9.	Write Trapezoidal rule.	2	5	L1
10.	Write the formula for modified Euler's method.	2	5	L1

PART-B

Answer any five questions. Each question carries 8 Marks (5 × 8 = 40 Marks)

Q. No.		Questions	Marks	CO	BTL
11.	a)	Solve $\frac{dy}{dx}(x^2y^3 + xy) = 1$	4	1	L2
	b)	Prove that the system of parabolas $y^2 = 4a(x + a)$ is self-orthogonal. Where 'a' is a parameter.	4	1	L3
12.	a)	Solve $(D^2 - 2D + 4)y = e^{2x}cosx$	4	2	L2
	b)	Solve $(D^2 + a^2)y = Secax$ by Method of variation of parameters.	4	2	L3
13.	a)	Find the directional derivative of the function $f = x^2 - y^2 + 2z^2$ at the point $P(1,2,3)$ in the direction of the line PQ where Q (5,0,4).	4	3	L3
	b)	Prove that $\nabla^2(r^n) = n(n+1)r^{n-2}$	4	3	L3
14.	a)	Find real root of $xlog_{10}x - 1.2 = 0$ up to three decimals by Regula-False method.	4	4	L3
	b)	Using Lagrange's interpolation formula, evaluate $f(8)$ given that	4	4	L3

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

15.		Find $y(0.1), y(0.2)$ using Runge-Kutta 4th order method given that $y' = y^2 + xy \; and \; y(0) = 1$	8	5	L3
16.	a)	Solve $x^2ydx - (x^3 + y^3)dy = 0$	4	1	L2
	b)	Solve $y''' - 4y' + 3y = 4e^{3x}$	4	2	L2
17.	a)	Find the angle between the surfaces $x^2 + y^2 + z^2 = 9$ & $z = x^2 + y^2 - 3$ at the point $(2, -1, 2)$.	4	3	L3
	b)	Find f (1.2) Using Newton's forward interpolation formula, and the given table of values	4	4	L3

X	1.1	1.3	1.5	1.7	1.9
f(x)	0.21	0.69	1.25	1.89	2.61

18.	a)	Evaluate $\int_{1.0}^{1.3} \sqrt{x}\, dx$ taking $h = 0.05$ by Trapezoidal rule	4	5	L2
	b)	Solve $x^2\frac{dy}{dx} = 3x^2 - 2xy + 1$	4	1	L3

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Office of the Controller of Examinations * M.J.C.E.T. - (A)

MJCET-R25

QP Code: 26A020E03

Muffakham Jah College of Engineering and Technology

Mount Pleasant, 8-2-249 to 267, Road No. 3, Banjara Hills, Hyderabad -34
(UGC autonomous institution under Osmania University)

B.E. II-Semester (Regular) Examination, July 2026
[Common to CE, ECE, ME, CS(AI), CS(DS), CS(AIML)]

Subject: ENGINEERING CHEMISTRY

Time: 03 hours **Max. Marks: 60**

Note:
1. The question paper comprises Part A and Part B.
2. Part A is compulsory which carries 20 marks.
3. Part B consists of eight questions. Each question carries 08 marks. Answer any five questions.
4. Missing data, if any, maybe suitably assumed.

PART-A

(Answer All the questions. Each question carries 2 Marks) **(10×2 = 20 Marks)**

Q. No.	Questions	Marks	CO	BTL
1.	Write the differences between Electrolytic cell & galvanic cell.	2	1	1
2.	What are primary and secondary batteries.	2	1	2
3.	Discuss briefly waterline corrosion?	2	2	2
4.	Mention different salts which cause hardness in water	2	2	3
5.	Define Degree of Polymerization. Give an example	2	3	1
6.	What are conducting polymers. Give Examples.	2	3	1
7.	Define HCV and LCV.	2	4	2
8.	Give the composition of CNG. Write its applications.	2	4	2
9.	What are applications of NMR spectroscopy.	2	5	2
10.	State Beer-Lambert's law.	2	5	1

PART-B

Answer any five questions. Each question carries 8 Marks (5 × 8 = 40 Marks)

Q. No.		Questions	Marks	CO	BTL
11.	a)	Derive Nernst equation and write its applications.	4	1	3
	b)	Describe the construction and working of lead acid battery.	4	1	2
12.	a)	Discuss any four factors effecting rate of corrosion.	4	2	2
	b)	Explain reverse osmosis method of softening of water with a neat sketch.	4	2	3
13.	a)	Distinguish between addition and condensation polymerization.	4	3	3
	b)	What are biodegradable polymers, Explain the preparation and applications of polylactic acid (PLA)	4	3	2
14.	a)	Explain determination of Moisture and Volatile matter in proximate analysis of coal and write their significance.	4	4	2
	b)	Calculate HCV & LCV of a coal sample having the following composition: C=80%, H=5%, O=1%, S=2% remaining ash (Latent heat of steam = 587 Cal/gm)	4	4	3
15.	a)	Explain the principle underlying MRI scanning.	4	5	2
	b)	Write the applications of IR spectroscopy.	4	5	1
16.	a)	Discuss the construction and working of glass electrode with the help of a neat diagram.	4	1	2
	b)	Explain galvanization of steel sheet by hot dipping method	4	2	2
17.	a)	Write the properties and uses of following (a) Nylon 6,6 (b) Buna S	4	3	2
	b)	Summarize Octane rating and Cetane rating.	4	4	2
18.	a)	List 12 principles of Green Chemistry	4	5	1
	b)	What are the specifications of potable water.	4	2	2

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Office of the Controller of Examinations ★M.J.C.E.T. - (Autonomous)★

MJCET-R25

QP Code: 26A020E16

Muffakham Jah College of Engineering and Technology

Mount Pleasant, 8-2-249 to 267, Road No. 3, Banjara Hills, Hyderabad -34
(UGC autonomous institution under Osmania University)

B.E. (CSE) II-Semester (Regular) Examination, July 2026

Subject: ENGINEERING PHYSICS

Time: 03 hours **Max. Marks: 60**

Note:
1. The question paper comprises Part A and Part B.
2. Part A is compulsory which carries 20 marks.
3. Part B consists of eight questions. Each question carries 08 marks. Answer any five questions.
4. Missing data, if any, maybe suitably assumed.

PART-A

(Answer All the questions. Each question carries 2 Marks) **(10×2 = 20 Marks)**

Q. No.	Questions	Marks	CO	BTL
1.	List out any two distinctive characteristics of a laser.	2	1	1
2.	Write types of optical fiber based on their refractive index profile.	2	1	1
3.	Define Quantum gate and list out types of Quantum gates.	2	2	1
4.	What is Quantum entanglement.	2	2	1
5.	Define cooper pair?	2	3	1
6.	Mention any two applications of magnetic material.	2	3	1
7.	Write Maxwell's equations in integral form.	2	4	1
8.	An electromagnetic wave delivers 25 W of power uniformly over a surface area of 0.05 m^2. Calculate the magnitude of the Poynting vector.	2	4	3
9.	Define nanomaterials and list any two of their applications.	2	5	1
10.	Name the preparation methods for thin films.	2	5	1

PART-B

Answer any five questions. Each question carries 8 Marks **(5 × 8 = 40 Marks)**

Q. No.		Questions	Marks	CO	BTL
11.		Explain the construction and working of a CO_2 laser.	8	1	2
12.		Derive the Schrodinger time independent wave equation.	8	2	3
13.		State the Hall effect and derive the expression for the Hall coefficient.	8	3	3
14.	a)	Derive Poynting Vector by applying Maxwell's equations.	4	4	3
	b)	Define ultrasonic waves. List any four of their applications.	4	4	1
15.	a)	Explain any one technique for preparation of nanomaterial.	4	5	2
	b)	Differentiate bulk materials and thin films.	4	5	2
16.	a)	Draw and explain the block diagram of an optical fiber communication	4	1	2
	b)	What is the physical significance of wave function?	4	2	1
17.	a)	Superconducting tin has a critical temperature of 3.5 K at zero magnetic field and a critical field of 0.0205 T at 0 K. Find the critical field at 2 K.	4	3	3
	b)	Explain generation of ultrasonic waves by piezoelectric method.	4	4	2
18.	a)	Explain the working of a Scanning Electron Microscope (SEM).	4	5	2
	b)	Distinguish Soft and Hard Magnetic Materials.	4	3	3

@End@



MJCET R25

Muffakham Jah College of Engineering and Technology

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B.E. II-Semester (Regular) Examination, July 2026
[Common to CE, ECE, ME, CS(AI), CS(DS), CS(AIML)]

Subject: ENGLISH

Time: 03 hours **Max. Marks: 60**

Note:
1. The question paper comprises Part A and Part B.
2. Part A is compulsory which carries 20 marks.
3. Part B consists of eight questions. Each question carries 08 marks. Answer any five questions.
4. Missing data, if any, maybe suitably assumed.

PART-A

Answer All the questions. each question carries 2 marks (10X2M=20M)

Q. No.	Questions	Marks	CO	BTL
1.	**a) Fill in the blank with a suitable preposition.** Don't lean _____the wall; it is wet. **b)** Identify the two words that combine to form the given blend word, **Edutainment.**	2	2	1
2.	**Choose the correct option and fill in the blank.** **a)** I could not _____ (accept / except) his invitation due to my busy schedule. **b) Identify the sentence type.** The sky grew dark, and the rain began to fall. (Simple sentence/Compound sentence /Complex sentence)	2	2	1
3.	**Fill in the blanks by choosing the most appropriate word.** **a)** Neither the teacher nor the students _____ (were / was) absent today. **b)** Sita didn't attend the meeting _____ (since/although) she was unwell.	2	3	2

4.	**a) Choose the synonym of the underlined word.** The scientist gave a plausible explanation for the unusual results. a) doubtful b) reasonable c) strange d) lengthy **b) Fill in the blank with a suitable collocation.** The project team reached a _____ (close attention/final decision) yesterday.	2	2	1
5.	**Replace the phrases with one-word substitutes.** **a)** A person who loves books. **b)** A person who looks at the brighter side of everything	2	2	1
6.	**Choose the correct phrasal verb to complete the sentence.** **a)** He _____ (put off / ran over / gave up) smoking last year. **b)** The students _____ (went through / took up / fell behind) the notes again before the exam.	2	2	2
7.	**Change the following sentences into reported speech.** **a)** "Will you be attending the seminar tomorrow?" she said. **b)** My friend said, "Do not waste time before your examination."	2	3	3
8.	**a) Fill in the blanks with the correct homophones.** The teacher asked him to____ an example that describes the breathtaking _____ of the Himalayan mountains. (sight /cite). b) Define a Homograph with a suitable example.	2	2	1
9.	**Identify the errors and rewrite the sentences correctly.** **a)** He prefers tea than coffee. **b)** The list of participants are on the notice board.	2	3	3
10.	**a) Replace the underlined phrase with a suitable euphemism.** He was fired from his job. **b) Choose the correct degree of comparison to complete the sentence.** Very few cities in India are as _____ (clean / cleaner / cleanest) as Chandigarh.	2	2	2

PART-B

Answer any five questions. Each question carries 8 Marks **(5 × 8 = 40 Marks)**

Q. No.		Questions	Marks	CO	BTL
11.	a)	Examine the qualities the poet expects an individual to cultivate in the poem "If".	4	1	3
	b)	Discuss any four methods of note-taking with appropriate visuals illustrations.	4	4	2
12.	a)	Analyse the ethical dilemma presented in the story, 'Anukul'. Should robots like Anukul be considered responsible for their actions? Support your answer with reasons from the text.	4	1	3
	b)	Compose a paragraph in about 250 words on 'The rise in mental health issues among youth and the importance of awareness'.	4	4	3
13.	a)	How can the message of the poem "Leisure" be applied to the lifestyle of students today? Give relevant examples.	4	1	3
	b)	Write a letter of inquiry to The Director, Zenith Coaching Institute, asking for details about their crash course for competitive exams. Ask about duration, fees, batch timings, faculty, and study material.	4	5	3
14.	a)	Examine Bacon's statement: "Studies serve for delight, for ornament, and for ability." What deeper meaning does each term hold?	4	1	3
	b)	Describe a sports event at your college that you participated in. Write about the teams, the atmosphere, key moments, the result, and the celebrations in 250 words.	4	4	3
15.	a)	How does Adichie contrast her childhood stories with the stories she later discovers about Africa and America?	4	1	3
	b)	**Read the passage and summarize it. Provide a suitable title.** Time management is an essential skill in both academic and professional life. Many people struggle not because they have too much work, but because they fail to prioritize tasks effectively. Procrastination, distractions, and unclear goals often lead to wasted hours and increased stress. Successful time managers usually begin their day with a clear plan, dividing tasks into urgent and important categories. They also learn to say "no" to unnecessary activities, allowing them to	4	4	3

focus on meaningful work. Taking short breaks improves concentration and prevents burnout. Most importantly, time management helps individuals achieve a healthy balance between responsibilities and personal life. When used well, time becomes a powerful tool for productivity, growth, and overall happiness.

16.	a)	**Fill in the blanks with the correct forms of the verbs given in brackets.** i) A number of students ___ (have / has) applied for the scholarship. ii)The pair of scissors ___ (is / are) missing. iii) The audience ___ (was / were) silent during the speech. iv)The staff ___ (has / have) agreed to the new timings.	4	3	3
	b)	Explain any four essentials of an effective paragraph. Also, discuss the different kinds of paragraphs with examples.	4	4	2
17.	a)	Write brief notes on Euphemism and Inclusive Language with appropriate examples for each.	4	2	2
	b)	**Fill in the blanks with the correct tense forms of the verbs given in brackets.** i) I _____ (read) this novel twice already. ii) He promised that he _____ (help) me with the assignment. iii) At this time tomorrow, we _____ (write) the exam. iv) She _____ (work) on the project when the power went off.	4	3	3
18.	a)	How did reading British and American books in childhood influence Adichie's writing? How does this experience connect with the concept of the 'single story'?	4	1	3
	b)	**Identify the errors and rewrite the sentences correctly.** i)The news are very surprising. ii)He does not knows how to drive. iii)I have completed the work day before yesterday. iv)She told me that she will visit tomorrow.	4	3	3

@End@



MJCET R25

QP Code: 26A02E55

Muffakham Jah College of Engineering and Technology

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(UGC autonomous institution under Osmania University)

B.E. (CSE) II-Semester (Regular) Examination, July 2026

Subject: BASIC ELECTRICAL ENGINEERING

Time: 03 hours **Max. Marks: 60**

Note:

1. The question paper comprises Part A and Part B.
2. Part A is compulsory which carries 20 marks.
3. Part B consists of eight questions. Each question carries 08 marks. Answer any five questions.
4. Missing data, if any, maybe suitably assumed.

PART-A

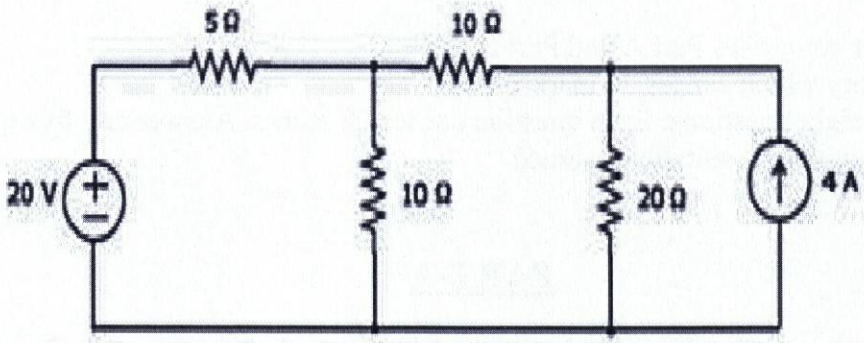
(Answer all the questions. Each question carries 2 marks) **(10×2 = 20 Marks)**

Q. No.	Questions	Marks	CO	BTL
1.	Classify electrical circuit elements and write their voltage equations.	2	1	1
2.	Define ohms law.	2	1	1
3.	Define Reactive power and write its units.	2	2	1
4.	What is phasor? Explain	2	2	1
5.	What is the function of Commutator and Brushes in a DC Generator?	2	3	2
6.	List out Various losses in a transformer	2	3	2
7.	Write the applications of Three phase Induction Motor.	2	4	1
8.	Write any two differences between squirrel cage and slip ring Induction motor?	2	4	2
9.	What is the function of Fuse?	2	5	2
10.	Define power factor & write its one significance.	2	5	1

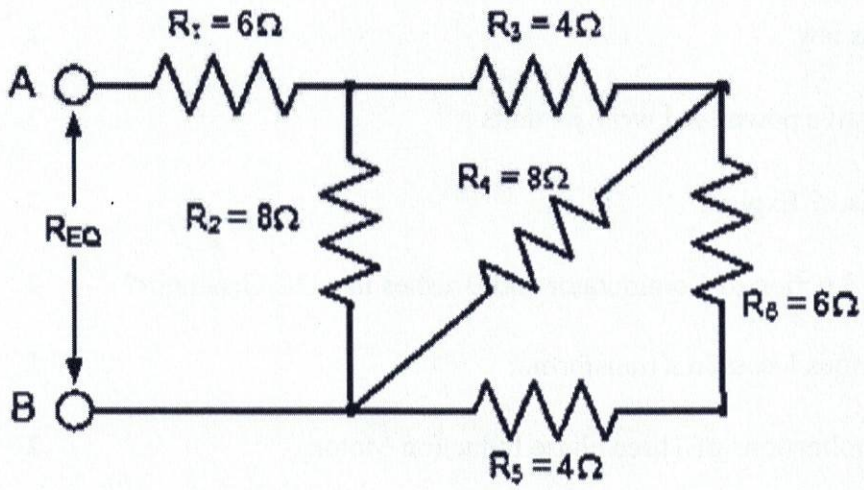
PART-B

Answer any five questions. Each question carries 8 marks (5 × 8 = 40 Marks)

Q. No.		Questions	Marks	CO	BTL
11.	a)	Find the current through 20 ohms resistor using Kirchhoff's laws as shown below.	4	1	2

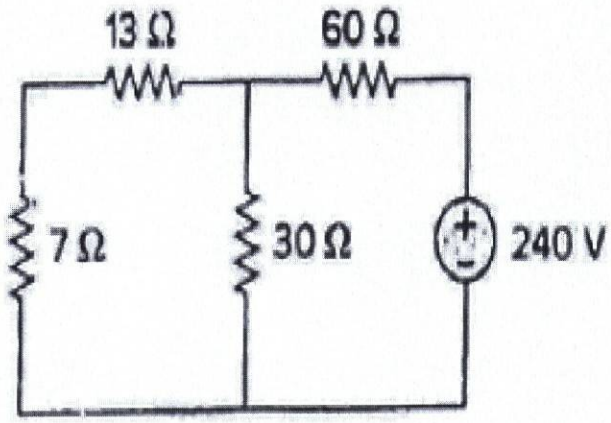


	b)	State and explain Superposition theorem with an example.	4	1	3
12.	a)	Find the equivalent resistance for the circuit shown below.	4	2	2



	b)	Derive the phase, line voltage and current relations in star connected 3phase supply system.	4	2	2
13.	a)	Derive the EMF Equation of DC Generator.	4	3	3
	b)	Explain the operation of a 1-Phase transformer with a neat sketch.	4	3	2
14.	a)	Explain the construction of three phase Induction Motor.	4	4	1
	b)	Explain the working of capacitor start single phase induction motor.	4	4	1

15.	a)	What are the drawbacks of low power factor, describe how it is improved?	4	5	2
	b)	A consumer uses a 10 kW geyser, 6 kW electric furnace and five 100 watt bulbs for 15 hours. How many units (kWh) of electrical energy have been used? Find the total cost of energy consumption if the cost per unit is Rs. 2.5.	4	5	3
16.	a)	State Thevenin's Theorem and find the current in 7 ohms resistor.	4	1	2



	b)	Analyze the series RL circuit with a neat sketch and also draw the phasor diagram	4	2	4
17.	a)	A 4500 V/225 V, 50 Hz single-phase transformer is to have an approximate e.m.f. per turn of 15 V and operate with a maximum flux of 1.4 T. Calculate (i) the number of primary and secondary turns and (ii) the cross-sectional area of the core	4	3	3
	b)	Classify the DC Motors and explain it.	4	4	1
18.	a)	Describe the function of a Switch Fuse Unit (SFU) and how it differs from a Miniature Circuit Breaker (MCB).	4	5	2
	b)	Explain the following terms of AC circuits (i) rms value (ii) average value (iii) peak value (iv) form factor	4	2	1

@End@



MJCET-R25

QP Code: 26A02CE013

Muffakham Jah College of Engineering and Technology

Mount Pleasant, 8-2-249 to 267, Road No. 3, Banjara Hills, Hyderabad -34
(UGC autonomous institution under Osmania University)

B.E.(CIVIL) II-Semester (Regular) Examination, July 2026

Engineering Mechanics

Time: 03 hours **Max. Marks: 60**

Note:

1. The question paper comprises Part A and Part B.
2. Part A is compulsory which carries 20 marks.
3. Part B consists of eight questions. Each question carries 08 marks. Answer any five questions.
4. Missing data, if any, maybe suitably assumed.

PART-A

(Answer All the questions. Each question carries 2 marks) **(10×2 = 20 Marks)**

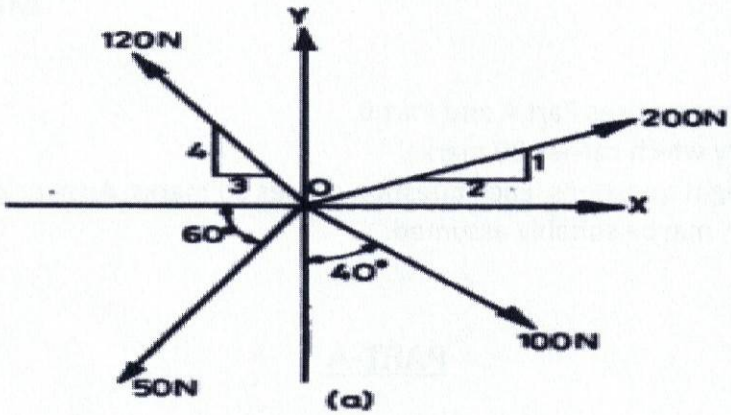
Q. No.	Questions	Marks	CO	BTL
1.	Define force and its characteristics.	2	1	1
2.	Define moment of a force.	2	1	1
3.	What are the equations of equilibrium for a coplanar Non concurrent/ force system ?	2	2	1
4.	State Varignon's theorem	2	2	1
5.	What is method of joints? Explain Briefly.	2	3	1
6.	Define centroid.	2	3	1
7.	State Pappus's Theorem for finding the volume of a solid of revolution.	2	4	1
8.	State and explain parallel axis theorem.	2	4	1
9.	State the law of conservation of momentum.	2	5	1
10.	State the work-energy principle	2	5	1

QP Code: 26A02CE013

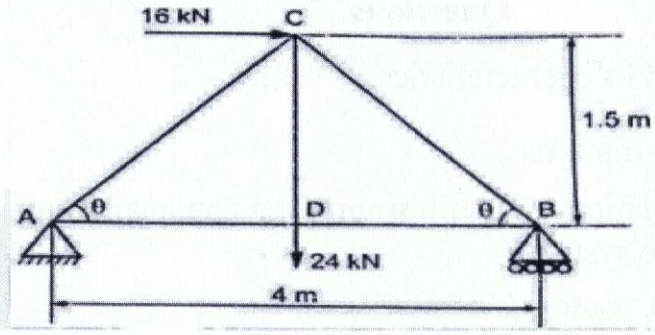
PART-B

Answer any five questions. Each question carries 8 Marks (5 × 8 = 40 Marks)

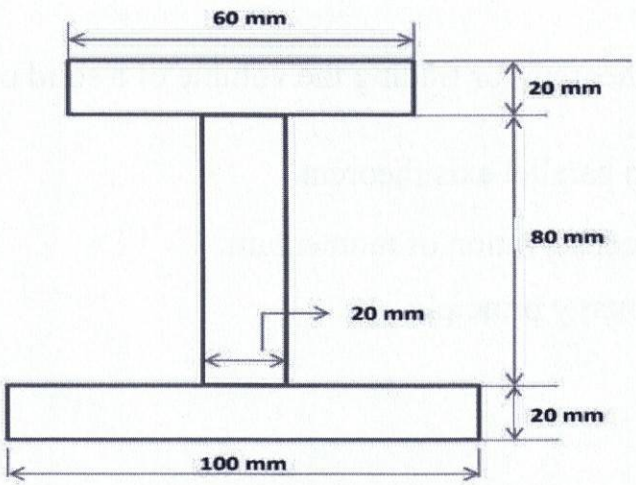
Q. No.	Questions	Marks	CO	BTL
11.	A system of forces is acting on a body is shown in figure below. Compute the resultant force.	8	1	3

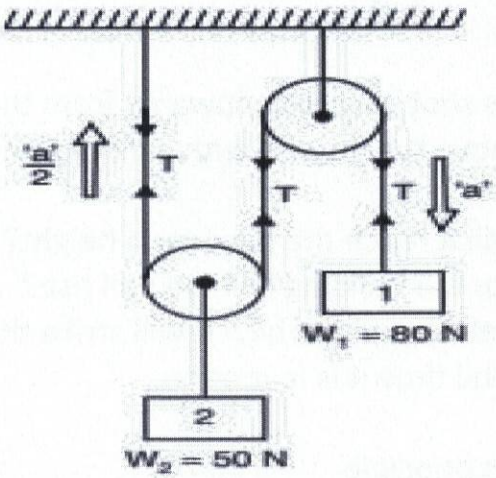
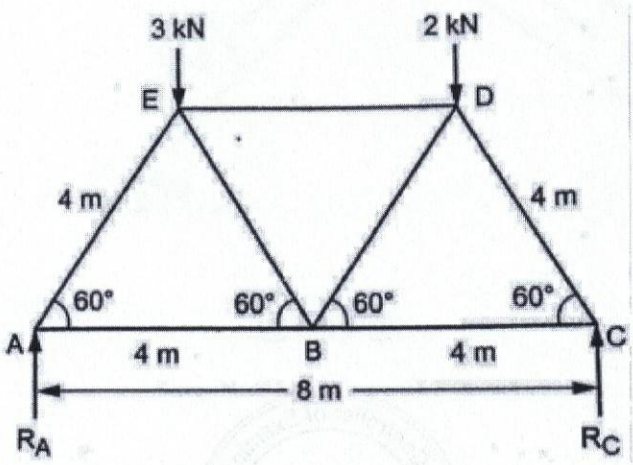


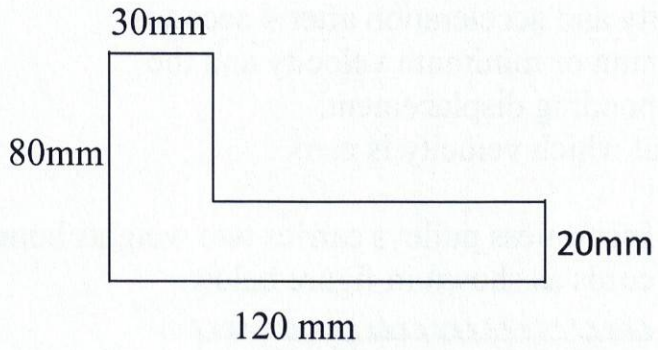
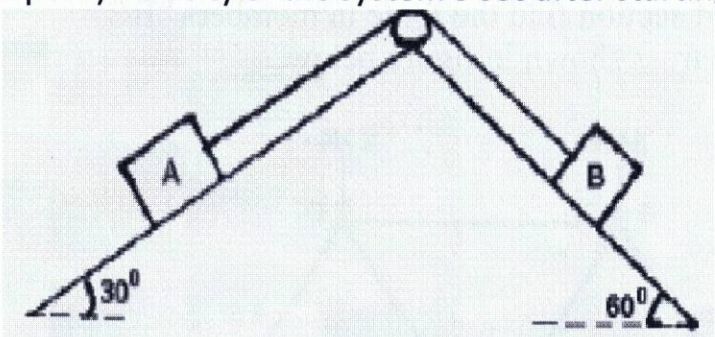
12.	Determine the forces in all the truss members shown in figure below using method of joints.	8	2	3



13.	Find M.I about the Centroidal X-axis of the figure shown below.	8	3	3



14.		The motion of a particle moving in a straight line is given by the expression, $S = t^3-3t^2+2t+5$ where, S is the displacement in metres and t is the time in seconds. Determine: 1. Velocity and acceleration after 4 seconds. 2. Maximum or minimum velocity and the corresponding displacement. 3. Time at which velocity is zero.	8	4	4
15.		A system of frictionless pulleys carries two weights hung by inextensible cords as shown in figure below.  Find the velocity of weight '1' after weight '2' travel a distance of 5m released from rest.	8	5	4
16.	a)	Discuss the various types of force systems.	4	1	2
	b)	Using method of section find the force in members "BE' and 'DE' of the truss shown in figure below.  	4	2	3

17.	a)	A 'L' section consists of a flange measuring 120 mm×20 mm, and a web measuring 80 mm×30 mm. Find the centroid of the section. 	4	3	3
	b)	A small steel ball is shot vertically upwards from the top of a building 25 m above the ground with an initial velocity of 18 m/sec. (a) In what time will it reach the maximum height? (b) How high above the building will the ball rise? (c) Compute the velocity with which it will strike the ground and the total time it is in motion.	4	4	3
18.	a)	State D'Alembert's principle	2	4	1
	b)	Blocks A and B weighing 500 N and 1500 N respectively are connected by a weightless rope passing over a frictionless pulley as shown in the figure. The coefficient of friction is 0.3 on all contact surfaces. Determine: i) Tension in the rope. ii) Velocity of the system 5 sec after starting from rest. 	6	5	4

@End@

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MJCET-R25

QP Code: 26A02ME13

Muffakham Jah College of Engineering and Technology

Mount Pleasant, 8-2-249 to 267, Road No. 3, Banjara Hills, Hyderabad -34
(UGC autonomous institution under Osmania University)

B.E.(MECH.) II-Semester (Regular) Examination, July 2026

Subject: Engineering Mechanics

Time: 03 hours **Max. Marks: 60**

Note:

1. The question paper comprises Part A and Part B.
2. Part A is compulsory which carries 20 marks.
3. Part B consists of eight questions. Each question carries 08 marks. Answer any five questions.
4. Missing data, if any, maybe suitably assumed.

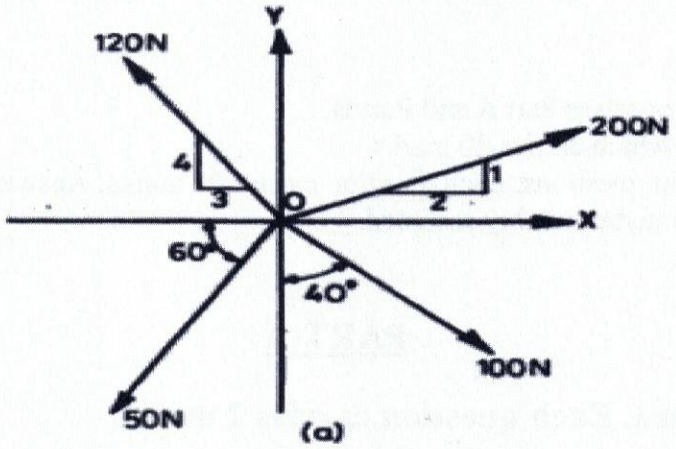
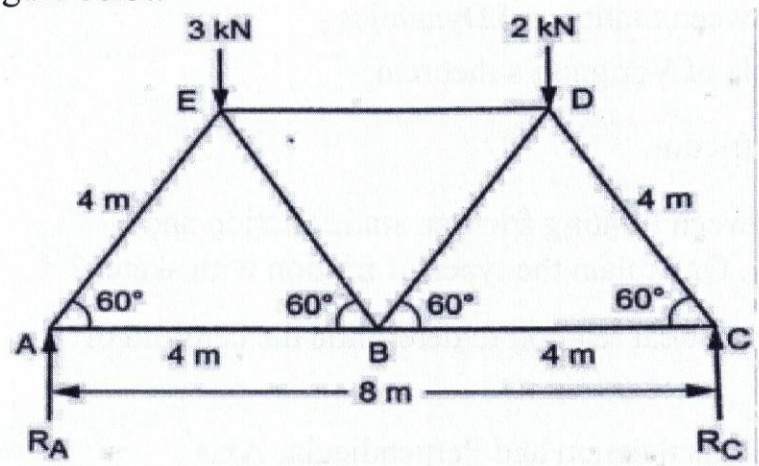
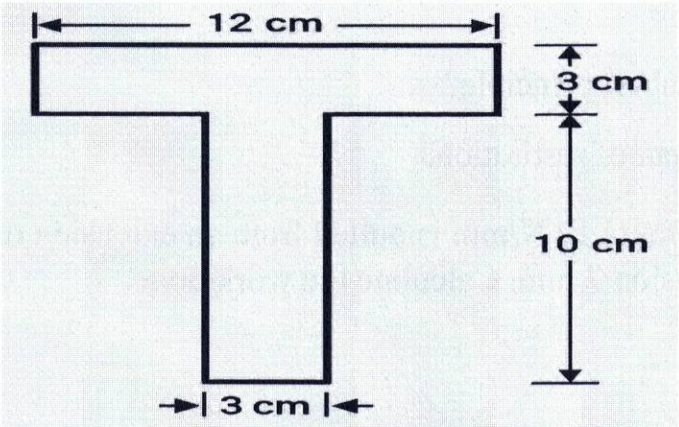
PART-A

Answer All the questions. Each question carries 2 marks **(10×2 = 20 Marks)**

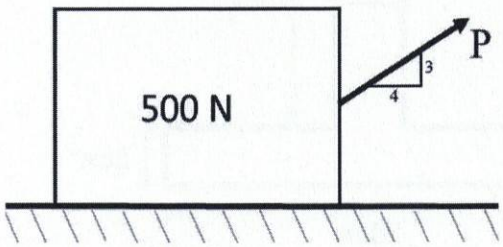
Q. No.	Questions	Marks	CO	BTL
1.	Differentiate between Statics and Dynamics	2	1	1
2.	State the principle of Varignon's theorem.	2	1	2
3.	Define angle of friction	2	2	2
4.	Differentiate between limiting friction, static friction and dynamic friction. Or explain the types of friction with sketch?	2	2	2
5.	Develop a mathematical relation to determine the centroid of triangle.	2	3	2
6.	What is Parallel axis theorem and Perpendicular Axis Theorem?	2	3	1
7.	Distinguish between rectilinear motion and curvilinear motion with illustrations	2	4	1
8.	What is D'Alambart principle?	2	4	2
9.	Define coefficient of restitution.	2	5	1
10.	A spring of stiffness 12 N/mm is pulled from an extension of 1 mm to an extension 2 mm. Calculate the work done.	2	5	1

PART-B

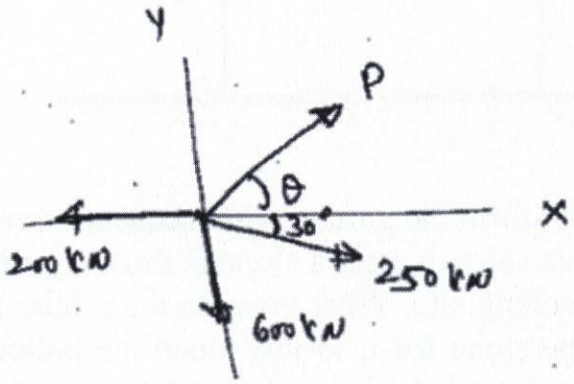
Answer any five questions. Each question carries 8 marks **(5 × 8 = 40 Marks)**

Q. No.	Questions	Marks	CO	BTL
11.	Find the resultant of forces shown in figure below.  (a)	8	1	2
12.	Determine the forces in all members of a truss shown in figure below 	8	2	3
13	Find the moment of inertia of the sections shown in the figure below about the centroidal X- axes. 	8	3	4

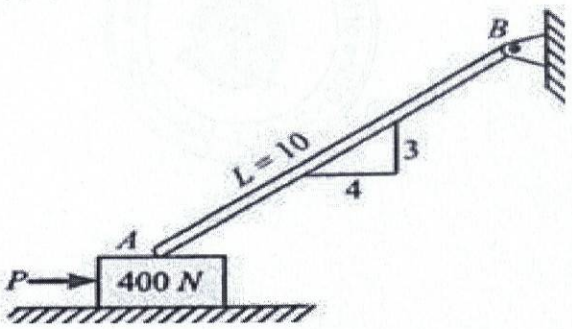
14.	a)	A golf ball is hit from an elevated tree to a green; the distance, horizontally, is 110 m. If the initial velocity of the ball is 30 m/s at 53.1° to horizontal, how high is the tee above the green?	6	4	3
	b)	Determine the force P that will give the body shown in figure below an acceleration of 2 m/s^2. The coefficient of kinetic friction is 0.2.	2	4	4

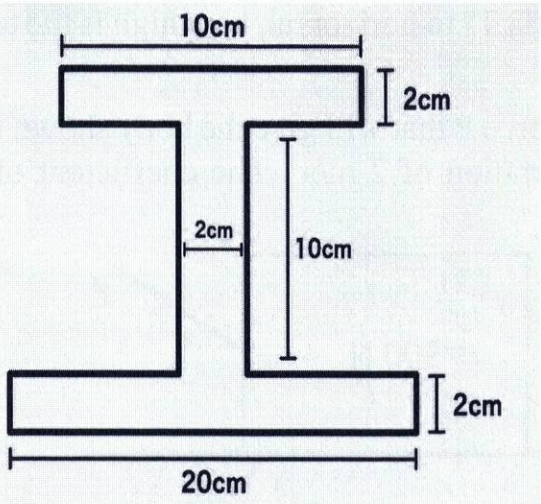
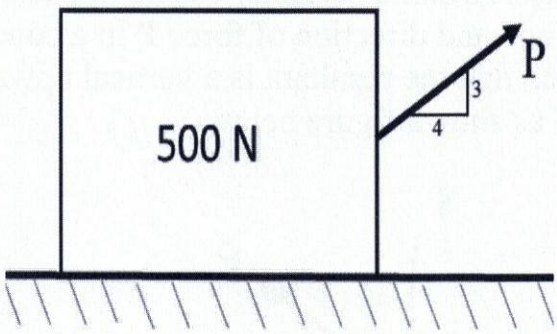


15.	a)	Derive Work Energy Equation for translation	4	5	3
	b)	Three balls A, B, and C with masses 12.5 kg, 26 kg, and 55 kg respectively move along the same straight line and in the same direction with velocities of 16 m/s, 4 m/s and 3 m/s. If A colloid with B and subsequently B collides with C, find the final velocities. Assume perfectly elastic impacts.	4	5	3
16.	a)	Find the magnitude and direction of force **P** in a concurrent force system such that the resultant is a vertical upward force of 250 kN as shown figure below.	4	1	3



	b)	A uniform bar AB, 10 m long and weighing 280 N, is hinged at B and rests upon a 400 N block at A as shown in figure below. If the coefficient of friction is 0.40 at all contact surfaces, find the horizontal force P required to start moving the 400 N block.	4	2	3



17.	a)	Find the centroid of the given section as shown in figure below. 	4	3	4
	b)	When the angular velocity of 4m diameter pulley is 3rad/sec the total acceleration of a point on its rim is 30m/sec^2. Determine the angular acceleration of pulley at this instant.	4	4	3
18.	a)	Determine the velocity of the block shown in figure below after moving 6m horizontally starting from rest. 	4	5	3
	b)	A balloon rises form the ground with a constant acceleration of 3 m/s^2. Five seconds later a stone is thrown vertically up from the launching site. What must be the minimum initial velocity of the stone for it to just touch the balloon? Note that the balloon and the stone have the same velocity at contact.	4	4	3

@End@

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MJCET-R25

QP Code: 26A02E04

Muffakham Jah College of Engineering and Technology

Mount Pleasant, 8-2-249 to 267, Road No. 3, Banjara Hills, Hyderabad -34
(UGC autonomous institution under Osmania University)

B.E. (ECE) II-Semester (Regular) Examination, July- 2026

Subject: ELECTRONIC DEVICES

Time: 03 hours **Max. Marks: 60**

Note:
1. The question paper comprises Part A and Part B.
2. Part A is compulsory which carries 20 marks.
3. Part B consists of eight questions. Each question carries 08 marks. Answer any five questions.
4. Missing data, if any, maybe suitably assumed.

PART-A

Answer All the questions. Each question carries 2 Marks **(10×2 = 20 Marks)**

Q. No.	Questions	Marks	CO	BTL
1.	What is doping?	2	1	1
2.	What is Avalanche break down?	2	1	1
3.	Define PIV, what is the value of PIV for bridge rectifier?	2	2	1
4.	Explain the necessity of filter circuit after the rectifier circuit.	2	2	1
5.	Define α,β and give the relation between them.	2	3	1
6.	What is thermal run away?	2	3	1
7.	What is an amplifier?	2	4	1
8.	Define hybrid parameters.	2	4	1
9.	Define Pinch off Voltage?	2	5	1
10.	Differentiate between Enhancement MOSFET and Depletion MOSFET.	2	5	1

PART-B

Answer any five questions. Each question carries 8 Marks **(5 × 8 = 40Marks)**

Q. No.		Questions	Marks	CO	BTL
11.	a)	With the help of neat Energy band diagrams classify the materials into insulators, Semiconductors and Conductors.	4	1	1
	b)	Explain the concept of formation of PN junction diode and working of PN junction under forward and reverse bias.	4	1	1

12.	a)	Draw the circuit diagram of a Half wave rectifier. Explain the circuit operation and sketch the waveforms.	4	2	1
	b)	An AC Supply of 220V, 50Hz is applied to a HWR through a transformer of turns ratio 10:1. Find (i) RMS value of load current (ii) Power delivered to load (iii) Efficiency (iv) Ripple Factor	4	2	2
13.	a)	Explain the construction and operation of NPN transistor with neat sketch. Also comment on the characteristics of NPN transistor.	4	3	1
	b)	Draw a fixed bias circuit using BJT and derive an expression for the stability factor.	4	3	2
14.	a)	Draw the h-parameter model of a BJT-CE amplifier and derive the equations for voltage gain, current gain, input impedance and output impedance. (Approximate Analysis)	4	4	3
	b)	Explain the principle of operation of LED.	4	4	1
15.		Describe the construction and working principle of N-channel JFET and draw its drain and transfer characteristics. Define drain resistance (rd) and trans-conductance (gm).	8	5	1
16.	a)	Differentiate between transition capacitance and diffusion capacitance of a diode.	4	1	2
	b)	Explain the operation of Full Wave Rectifier with centre tap transformer along with necessary diagrams.	4	2	1
17.	a)	Explain the input characteristics of BJT in common base configuration.	4	3	2
	b)	The hybrid parameters of a transistor used as an amplifier in the CE configuration are hie = 800 Ω, hfe = 46, hoe = 80 x 10^{-6} ℧ and hre = 5.4x 10^{-4}. If R^{l}_{L}= 5KΩ and R^{l}_{S}=500Ω. Find Ai, Ri , Av, Ro. (Approximate Analysis)	4	4	3
18.	a)	Differentiate between JFET and MOSFET.	4	5	2
	b)	Compare the performance of CE, CB, CC.	4	3	2

@End@



MJCET-R25

QP Code: 26A02S16

Muffakham Jah College of Engineering and Technology

Mount Pleasant, 8-2-249 to 267, Road No. 3, Banjara Hills, Hyderabad -34
(UGC autonomous institution under Osmania University)

B.E. II-Semester (Regular) Examination, July- 2026

Subject: Scientific Programming

(Common to CSE, CSE (AI&ML), CSE (DS) and CSE (AI))

Time: 03 hours **Max. Marks: 60**

Note:

1. The question paper comprises Part A and Part B.
2. Part A is compulsory which carries 20 marks.
3. Part B consists of eight questions. Each question carries 08 marks. Answer any five questions.
4. Missing data, if any, maybe suitably assumed.

PART-A

Answer All the questions. Each question carries 2 Marks **(10×2 = 20 Marks)**

Q. No.	Questions	Marks	CO	BTL
1.	Explain the concept of string slicing and negative indexing in strings with an example.	2	1	2
2.	What is MATLAB workspace?	2	1	1
3.	Define exception handling.	2	2	1
4.	List control structures in Python.	2	2	1
5.	Write code to demonstrate anonymous function?	2	3	2
6.	What are the uses of contour plots?	2	3	1
7.	How is numpy helpful for python coders?	2	4	1
8.	Differentiate 2D printing with 3D printing?	2	4	1
9.	Define eigenvalues.	2	5	1
10.	State Simpson's rule?	2	5	1

PART-B

Answer any five questions. Each question carries 8 Marks (5 × 8 = 40 Marks)

Q. No.		Questions	Marks	CO	BTL
11.	a)	Explain the Sets and Dictionaries in python with proper examples	4	1	2
	b)	How are packages managed in python?	4	1	2
12.	a)	Write a Program that demonstrates "*for*" loop?	4	2	2
	b)	Explain the concept of functions in python?	4	2	2
13.	a)	Explain the Data Analysis Function?	4	3	2
	b)	Create a MATLAB function for finding the factorial of a given integer?	4	3	1
14.	a)	What are the uses of CSV files? Write a python program that reads a CSV file.	4	4	2
	b)	Explain Bar graphs, Histograms in MATLAB with an example.	4	4	2
15.	a)	Write Python program for Bisection method to solve a function defined as $f(x) = x^2 - 4$.	4	5	3
	b)	What is numerical integration? Explain Trapezoidal Rule.	4	5	2
16.	a)	Write a Python program to remove duplicate elements from a list.	4	1	2
	b)	Describe MATLAB matrix operations.	4	2	3
17.	a)	Explain MATLAB built-in functions.	4	3	2
	b)	Explain NumPy arrays and it's an operation with an example program.	4	4	3
18.	a)	Explain Gauss-Seidel method.	4	5	2
	b)	Explain recursion with example?	4	2	2

@End@

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