MJCET-R25 QP Code: 26A03M43

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. I-Semester (Supply) Examination, July 2026

Subject: Matrices and Differential Calculus

(Common to All Branches)

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.	Determine whether the set $A = \{(1,0,0), (1,2,0), (1,2,3)\}$ is linearly independent?	2	1	2
2.	Reduce the matrix $A = \begin{bmatrix} 2 & 0 & -1 \\ 1 & -2 & 4 \\ 2 & 1 & 4 \end{bmatrix}$ into Echelon form and hence, find it's rank.	2	1	1
3.	Find the sum and product of the eigen values of the following matrix $A = \begin{bmatrix} 2 & -2 & 3 \\ -2 & 1 & 3 \\ 1 & 3 & 0 \end{bmatrix}$.	2	2	1
4.	What are the characteristic roots of the matrix $A = \begin{bmatrix} 3 & 2 & 3 \\ 0 & 2 & 2 \\ 0 & 0 & -4 \end{bmatrix}$	2	2	2
5.	Find the Taylor's series for the function $sinx$ in powers of $(x - \frac{\pi}{2})$	2	3	1
6.	Define Radius of Curvature.	2	3	2
7.	Show that $\underset{(x,y)\to(2,1)}{Lt}(x^2 + 2x - y^2) = 7$	2	4	2
8.	If $u = x^2 - y^2, v = 2xy$ and $x = r\cos\theta, y = r\sin\theta$, find $\frac{\partial(u,v)}{\partial(r,\theta)}$	2	4	1
9.	Find $\int_1^2 \int_3^4 (xy + e^y)\, dydx$.	2	5	1
10.	Evaluate $\int_0^a \int_0^b \int_0^c (x + y + z)\, dzdydx$.	2	5	3

PART-B

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

Q. No.		Questions	Marks	CO	BTL
11.		Apply Gauss elimination method to solve the following equations $x + 4y - z = -5; x + y - 6z = -12; 3x - y - z = 4.$	8	1	3
12.		Verify Cayley Hamilton Theorem, and hence find A^{-1} for the matrix $A = \begin{bmatrix} 3 & 1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 5 \end{bmatrix}$.	8	2	3
13.		Verify Lagrange's Mean Value Theorem for the function $x^3 - 6x^2 + 11x - 6 \ \ in \ [0,4]$.	8	3	3
14.		Find the maximum and minimum values of $x^3 + y^3 - 3axy$.	8	4	2
15.		Evaluate $\int_0^\infty \int_0^\infty e^{-(x^2+y^2)}\, dxdy$ by changing into polar coordinates.	8	5	3
16.	a)	Solve $4x - 3y - 9z + 6w = 0, 2x + 3y + 3z + 6w = 0, 4x - 21y - 39z - 6w = 0.$	4	1	2
	b)	Reduce the quadratic form $x^2 - 3z^2 + 2xy - 3yz$ into canonical form.	4	2	3
17.	a)	Verify Rolle's Theorem for the function $\frac{sinx}{e^x} \ \ in \ [0, \pi]$.	4	3	3
	b)	If $f(x,y,z) = x^3 + xz^2 + y^3 + xyz, x = e^t,$ $y = \cos t, z = t^3$, find the total derivative $\frac{df}{dt}$ at $t = 0$.	4	4	1
18.	a)	Evaluate $\int\int xy(x+y)\, dxdy$ over the area between $y = x^2$ and $y = x$.	4	5	3
	b)	Find Eigen values and Eigen vectors for the matrix $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & -1 & 1 \end{bmatrix}$	4	2	2

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MJCET-R25

QP Code:26A03E16

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. I-Semester (Supply) Examination, July 2026

Subject: Engineering Physics

(Common to CE, 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 = 20Marks)**

Q. No.	Questions	Marks	CO	BTL
1.	List the main characteristics of a Laser.	2	1	1
2.	Write any two applications of optical fibre	2	1	1
3.	Mention the different types of Quantum gates used in quantum computing.	2	2	1
4.	Write the formula for the energy of a particle in a one-dimensional box.	2	2	1
5.	What is QLED?	2	3	1
6.	Distinguish between soft and hard magnetic materials.	2	3	2
7.	Write Maxwell's equations in integral form?	2	4	1
8.	State any two applications of ultrasonic waves.	2	4	1
9.	What is the size range of nanomaterial?	2	5	1
10.	Name any two commonly used techniques for thin-film deposition.	2	5	1

PART-B

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

Q. No.	Questions	Marks	CO	BTL
11.	Explain the construction and working of semiconductor laser.	8	1	3
12.	Derive Schrodinger's time independent wave equation	8	2	3
13.	Classify the different types of magnetic materials.	8	3	3
14.	State and prove Poynting theorem	8	4	3
15.	Describe Electron beam evaporation method used for synthesis of thin films.	8	5	3
16.(a)	Distinguish types of optical fibre based on refractive index profile	4	1	1
(b)	Discuss the salient features of the Kronig–Penney model.	4	2	3
17.(a)	Distinguish Type-I and Type-II superconductors.	4	3	2
(b)	Explain briefly ultrasonic pulse-echo testing method.	4	4	2
18.(a)	Write any four applications of nanomaterials.	4	5	1
(b)	Derive expression for Hall coefficient	4	3	3

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MJCET-R25

QP Code:26A03E03

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) I-Semester (Supply) Examination, July 2026

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.	Define Standard electrode potential (SEP).	2	1	1
2.	Differentiate primary and secondary batteries.	2	1	2
3.	Mention the factors influencing corrosion.	2	2	1
4.	What are the various units of hardness?	2	2	2
5.	Define degree of polymerization with example?	2	3	1
6.	Give some applications of conducting polymers.	2	3	2
7.	What are the characteristics of good fuel.	2	4	1
8.	Discuss the knocking process in petrol engine.	2	4	2
9.	What is electromagnetic radiation (EMR)?	2	5	1
10.	How to achieve carbon neutrality?	2	5	3

PART-B

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

Q. No.		Questions	Marks	CO	BTL
11.		What is reference electrode? Describe the construction & working of calomel electrode.	8	1	1
12.		Explain cathodic protection method to control corrosion.	8	2	2
13.		Differentiate addition & condensation polymerization.	8	3	2
14.		What is refining of petroleum? Give composition and uses of Petrol, Diesel, and Kerosene.	8	4	2
15.		List 12 principles of green chemistry.	8	5	1
16.	a)	Explain construction & working of Hydrogen-Oxygen fuel cell with neat sketch.	4	1	2
	b)	100ml of hard water sample required 22ml of 0.01M EDTA solution after boiling and filtering required 10ml of same EDTA. Calculate temporary and permanent hardness.	4	2	3
17.	a)	Write properties & applications of PVC, Buna-S.	4	3	1
	b)	Calculate HCV & LCV of coal having the following composition: C= 85%, H= 8%, S=1%, O=2% remaining ash. (Latent heat of steam=587 cal/gm).	4	4	3
18.	a)	Describe the principle and applications of IR spectroscopy.	4	5	2
	b)	Explain briefly about ultimate analysis of coal.	4	4	2

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MJCET-R25

QP Code: 26A03255

Muffakham Jah College of Engineering and Technology

Mount Pleasant, 8-2-249 to 267, Road No. 3, Banjara Hills, Hyderabad - 500 034

(UGC Autonomous Institution under Osmania University)

B.E I-Semester (Supplementary) Examination, July 2026

Subject: BASIC ELECTRICAL ENGINEERING

(Common to CE, ECE, ME, CSE (AIML), 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. **Any missing data may be 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 Kirchhoff's Current Law.	2	1	2
2.	Classify electrical circuit elements.	2	1	1
3.	Define amplitude and frequency of an AC waveform.	2	2	2
4.	Define Active Power and write its units.	2	2	2
5.	What is the principle of Transformer.	2	3	1
6.	List the different losses in a transformer.	2	3	2
7.	Write the applications of single-phase induction motor.	2	4	2
8.	Define percentage slip of three phase Induction Motor.	2	4	2
9.	What is the function of fuse.	2	5	1
10.	Define earthing.	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.		State and explain Thevenin's theorem with a suitable example.	8	1	3
12.		Derive expression for Average and RMS value of sinusoidal waveform.	8	2	2
13.	a)	Derive the EMF equation of a DC Generator.	4	3	2
	b)	Calculate the generated EMF in a 6-pole, lap-wound DC generator running at 1200 RPM. The armature has 480 conductors and the flux per pole is 0.012 Wb.	4	3	2
14.		Explain the principle of production of rotating magnetic field in a 3-phase induction Motor with suitable phasor diagram.	8	4	2
15.	a)	Write the differences between MCB and MCCB.	4	5	1
	b)	A drone rated at 200 W operates for 5 hours every day. Assuming it is used continuously for 30 days, determine: a) The total energy consumed in kWh. b) The monthly electricity cost if the tariff is ₹2 per unit.	4	5	3
16.	a)	Derive the expression for equivalent resistance, when two resistances are connected in (i) Series and (ii) Parallel.	4	1	2
	b)	A resistance of 100 Ω is connected in series with a pure inductor of 250mH. The circuit is connected to a 230V, 50Hz AC supply. Calculate the (i) Total Impedance (ii) Total current and (iii) Real power consumed.	4	2	3
17.	a)	Write the differences between squirrel cage and slip ring Induction motors?	4	3	2
	b)	Explain briefly capacitor start and capacitor run 1-phase induction motor.	4	4	2
18.	a)	What is power factor and what are the advantages of improving the power factor of a system?	4	5	2
	b)	A 3-phase, 4-pole induction motor is connected to a 50 Hz supply. If it runs at a full-load speed of 1440 rpm, calculate its synchronous speed and percentage slip.	4	1	3

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MJCET-R25

QP Code: 26A03E147

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) I-Semester (Supply) Examination, July 2026

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 (10×2 = 20 Marks)

Q.No.	Questions	Marks	CO	BTL
1.	**Fill in the blanks with appropriate option.** i._____ snow fell than was predicted. (Fewer/less) ii. I learned how to sing ____the holidays.(in/during)	2	3	2
2.	**Fill in the blanks as directed.** i.Biography + picture = _____. (blending) ii. The constituent words of the compound word **inside** are ____ and ___	2	2	1
3.	**Fill in the blanks with appropriate option.** i. His trousers_____ cleaning.(need/ needs) ii. _____being a great skier, only few people outside of Europe know him.(Despite/Although)	2	2	3
4.	i.His efforts are **futile.** (Choose the synonym of the underlined word) a.useless b.useful c.brilliant d.none ii.This medicine would **subside** your pain. (Choose the antonym of the underlined word) a.decrease b.increase c. alleviate d.none	2	2	1
5.	**Fill in the correct form of the verb.** i.This _____an easy quiz so far (be). ii. She____to a doctor once a year for an examination (go)	2	2	3
6.	**Give the one-word substitutes for the following phrases:** i.A government ruled by the people: _____ ii.A person who loves his country: _____	2	2	1
7.	**Change into reported speech.** i.The traffic police said to me, "Where are you going without a helmet?" ii. The man shouted, "Let me go."	2	3	3
8.	**Choose the correct options and fill the blanks.** i.My cat was crazily chasing his ____while I read a fairy ____to my children. (tale, tail) ii.Being_____ makes me unhappy, but listening to my ____, Taylor Swift makes me happy.(idol ,idle)	2	2	1

9.		**Fill in the blanks using the correct forms of the adjectives in parentheses.** i. Today's weather is the_____ of the week. (bad) ii.This is the _____ restaurant in the city. (good)	2	3	3
10.		**Match appropriate formal expressions of the following words.** i. man-made — disabled or retarded ii. He is a special child — bald iii. You are becoming a little thin on top — humanity iv. mankind — artificial	2	2	1

PART-B

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

Q. No.		Questions	Marks	CO	BTL
11.	a	What is the advice given by Rudyard Kipling to his son in the poem "If"?	4	1	2
	b	Distinguish between Note-Taking And Note-Making.	4	4	2
12.	a	Discuss the central theme of "Anukul" by Satyajit Ray.	4	1	2
	b	**Write a paragraph in about 150 words based on the following hints and add a suitable title to it:** Internet – very informative – keeps us in touch with current events – facilitates communication – on the other hand – distracts us from our duties – unnecessary surfing – waste of time – use cautiously	4	4	3
13.	a	Which line in the poem 'Leisure' proves that in our busy lives we do not even have a fraction of a second to enjoy nature's beauty? Reflect on the idea.	4	1	2
	b	Your driving license is about to get expired in a month. Write a letter to the appropriate authority to renew your license. Sign yourself as Lakshay/Lakshita.	4	5	3
14.	a	What does Francis Bacon mean by the sentence "Some books are to be tasted, others to be swallowed, and some few to be chewed and digested." Explain each category with examples.	4	1	3
	b	List a few common mistakes to avoid in describing a process.	4	4	2
15.	a	What message does Adichie convey through "The Danger of a Single Story"?	4	1	3
	b	**Read the following passage carefully and paraphrase it.** We are living in a technical age. Many are convinced that science and technology hold the answers to all our problems. We should just let the scientists and technicians go on with their work, and they will create heaven here on earth.	4	4	3
16.	a	**Indicate the sentence type (Simple sentence /Complex sentence/Compound sentence/Complex-compound sentence).** i. Keith, Carrie, and Kyle bought donuts and ate them down by the river. ii. I left early so that I could get some work done, but I'll be back soon.	4	3	3

iii. Crossing the street is dangerous if you don't look both ways before you cross.

iv. Todd and Nick are eating chips and salsa on a park bench before dinner.

	b	Write a paragraph on "Science and its effect on our lives" in about 150 words.	4	4	3
17.	a	**Convert the following sentences as directed.**	4	3	3

i.Have you completed the work? (change to passive voice)

ii. My mother advised me to study well before my examination. (change to active voice)

	b	**Use the following points and describe the Preparation of Mustard Oil.**	4	4	3

1) Collect the seeds.
2) Dry the seeds.
3) Grind the seeds.
4) Add little water to the powdered seeds.
5) Extract the oil from the mixture.
6) Separate the oil.
7) Put oil in the pot.
8) Seal the container.
9) Ready for use and sale.
10) Preparation of Mustard Oil

18.	a	**Identify the errors and rewrite the sentences correctly.**	4	3	3

i. I will wait for them, till they will finish their work.

ii. She succeeded because she works hard.

iii. Smith came across with a beggar.

iv. The two last columns of the article are not clear.

	b	**Select the correct option to complete each sentence.**	4	2	2

i. The chef will ___ the food for tonight's party.

(a) make (b) give (c) take (d) do

ii. The meeting today was called ___for no reason.

(a) on (b) off (c) by (d) down

iii. We need to ___ our homework before watching TV.

(a) do (b) make (c) complete (d) finish

iv. They ___ great attention to detail in the project.

(a) gave (b) took (c) paid (d) made

@End@



MJCET-R25

QP Code: 26A03P1619

Muffakham Jah College of Engineering and Technology

Mount Pleasant, 8-2-249 to 267, Road No. 3, Banjara Hills, Hyderabad -34
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B.E. I-Semester (Supply) Examination, July 2026

Subject: Programming for Problem Solving

(Common to All Branches)

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 Compiler and Interpreter.	2	1	1
2.	List any four functions present in math.h.	2	1	1
3.	Find maximum of two number using conditional operator.	2	2	2
4.	Explain about static and auto storage class.	2	2	1
5.	Define an array and write its applications.	2	3	1
6.	Declare a 3D array.	2	3	1
7.	Define a pointer, with an example show how it is used and accessed.	2	4	2
8.	Why do string subscript ends with a NULL character?	2	4	2
9.	Define structure. How do you access structure member / elements?	2	5	1
10.	Write syntax for fopen( ) and fclose( ).	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.		Briefly explain the steps in compilation and execution of a program written in high level language.	8	1	2
12.		Explain the syntax and working of for, while, and do–while loops with suitable examples.	8	2	2
13.		Implement a C program to sort an array of integers in ascending order using Bubble Sort.	8	3	2
14.		Explain dynamic memory allocation in C. Discuss the functions malloc(), calloc(), realloc(), and free().	8	4	2
15.		What is the use of pointer in a self-referential structure? Explain in detail.	8	5	2
16.	a)	Construct a flow chart to find the roots of quadratic equation.	4	1	2
	b)	Explain the precedence and associativity of arithmetic, relational, and logical operators with suitable examples.	4	2	2
17.	a)	Develop a C code to read and display elements of 1D array.	4	3	2
	b)	Explain string handling functions available in C. Write a program to concatenate two strings without using library functions.	4	4	2
18.	a)	Implement a C program to copy contents of one file into another.	4	5	2
	b)	Explain array of structures with an example.	4	5	2

@End@

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