



## MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(Autonomous Institution – UGC, Govt. of India)

(Affiliated to JNTU, Hyderabad, Approved by AICTE - - ISO 9001:2015 Certified)

Accredited by NBA & NAAC – 'A' Grade

NIRF India Ranking, Accepted by MHRD, Govt. of India

### B.TECH I YEAR I SEMESTER REGULAR EXAMINATIONS, JANUARY-2024

#### APPLIED PHYSICS

(EEE, ECE, CSE-IOT, CSE-DS, IT, CSIT)

[Time: 3 Hours]

[Max. Marks: 60]

#### PART – A

(10x 1 = 10M)

- Note:**
1. This Part consists of 10 QUESTIONS
  2. Answer **All Questions**. Each question carries 1 Mark.

1	A	What is photoelectric effect?	1M	BTL2
	B	State de-Broglie hypothesis.	1M	BTL2
	C	Write the applications of Zener diode.	1M	BTL3
	D	Write the types of extrinsic semiconductors.	1M	BTL1
	E	What is pin diode.	1M	BTL1
	F	What are radiative and non radiative mechanisms.	1M	BTL2
	G	Write the characteristics of laser light.	1M	BTL2
	H	Define any two types of pumping mechanisms.	1M	BTL1
	I	Define dielectric constant and susceptibility.	1M	BTL1
	J	Write applications of magnetic materials.	1M	BTL3

#### PART – B

(5 x 10 = 50M)

- Note:**
1. This Part consists of 10 QUESTIONS
  2. Answer any 1 question from each Section. Each question carries 10 Marks.
  3. Illustrate your answers with NEAT sketches wherever necessary.

#### SECTION - I

2.A	Derive Schrodinger time independent wave equation.	7M	BTL2
2.B	Write the physical significance of wavefunction.	3M	BTL4

(OR)

3.A	Derive eigen values and eigen functions for a particle in one dimensional potential box.	7M	BTL3
3.B	Write the properties of matter waves.	3M	BTL2

## SECTION - II

4.A	Derive the equation for density of electrons in the conduction band in an intrinsic semiconductors.	7M	BTL2
4.B	What are drift and diffusion currents.	3M	BTL4

(OR)

5.A	Explain about Hall effect and find the equation for hall coefficient.	7M	BTL2
5.B	Write the differences between direct and indirect band gap semiconductors.	3M	BTL4

## SECTION - III

6.A	Explain construction and working principle of solar cell.	7M	BTL2
6.B	Write briefly about electroluminescence and photoluminescence.	3M	BTL1

(OR)

7.A	Explain the working principle of Avalanche photodetector.	7M	BTL2
7.B	Write the characteristics and applications of Avalanche Photodetector.	3M	BTL3

## SECTION – IV

8.A	Explain the construction and working of He-Ne laser.	7M	BTL2
8.B	Write the applications of laser.	3M	BTL3

(OR)

9.A	Explain optical fibre communication system with a neat block diagram.	7M	BTL2
9.B	Write about the principle in an optical fibre.	3M	BTL4

## SECTION – V

10.A	Explain about the Lorentz internal field.	7M	BTL3
10.B	Derive Clausius-Mossotti equation.	3M	BTL2

(OR)

11.A	Explain about Hysteresis curve based on domain theory.	7M	BTL2
11.B	Distinguish between soft and hard magnetic materials.	3M	BTL3

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### B.TECH I YEAR I SEMESTER REGULAR EXAMINATIONS, JANUARY-2024

### COMPUTER AIDED ENGINEERING GRAPHICS

(Common to EEE, ECE, CSE-DS, CSE-IOT, CSIT, IT)

[Time: 3 Hours]

[Max. Marks: 60]

#### PART – A

(10x 1 = 10M)

- Note: 1. This Part consists of 10 QUESTIONS  
2. Answer **All Questions**. Each question carries 1 Mark.

1	A	Mention Five Toolbars used to create drawings using software	1M	BTL2
	B	Mention commands used to select and erase objects	1M	BTL1
	C	Mention the convention used in orthographic projection	1M	BTL2
	D	What is LPP and RPP	1M	BTL1
	E	How do you create sector in a circular lamina	1M	BTL3
	F	What is the included angle of a pentagonal lamina	1M	BTL1
	G	What is the difference between cone and a cylinder	1M	BTL2
	H	How do you differentiate between, Appears to be inclined and actually inclined surfaces	1M	BTL2
	I	Define Isometric scale	1M	BTL1
	J	Give the convention used in isometric projection	1M	BTL2

#### PART – B

(5 x 10 = 50M)

- Note: 1. This Part consists of 10 QUESTIONS  
2. Answer any 1 question from each Section. Each question carries 10 Marks.  
3. Illustrate your answers with NEAT sketches wherever necessary.

#### SECTION - I

2.	Draw the ellipse with the major and minor axis lengths. Major axis=80mm and Minor axis= 50mm. Also draw the tangent at a point on the curve	10M	BTL4
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(OR)

3.A	Draw a Parabola with the base=100mm by Tangent/ Triangle method	5M	BTL4
3.B	Draw an ellipse in the parallelogram of sides 80mm and 50mm. The acute angle is 60°	5M	BTL4

#### SECTION - II

4.	A line 60mm long has one end 10mm above HP and 20mm in front of VP. The line is inclined at 30° to the HP and 45° to VP. Draw the projections of the line	10M	BTL5
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(OR)

5.A	Draw the projection of a point B, which is 40mm below HP and 10mm in front of VP	5M	BTL1
5.B	A line AB 60mm long has its end B, 20mm above the HP and 25mm in	5M	BTL2

	front of VP. The end A is 50mm away from both the reference planes. Draw its projections and find its inclinations with VP and HP.		
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## SECTION - III

6.A	A pentagonal lamina of side 30mm is placed on one of its corners on HP such that the perpendicular bisector of the side opposite to it is inclined at $30^{\circ}$ to HP and $45^{\circ}$ to VP. Draw the projections of the lamina	5M	BTL5
6.B	A square plate of side 40mm rests on HP on one of its corners such that the diagonal through the corner on which it rests is inclined at $30^{\circ}$ to HP and $40^{\circ}$ to VP. Draw the projections.	5M	BTL4

(OR)

7.	A triangular lamina of side 30mm rests on one of its sides on HP such that the corner opposite to the side on which it rests is 20mm above HP. Draw the projections of the lamina when the side on which it rests is 20mm above HP. Draw the projections of the lamina when the side on which it rests is inclined at $30^{\circ}$ to VP. Also determine the inclination of the surface of lamina with HP	10M	BTL1
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## SECTION – IV

8.A	Draw the projections of a hexagonal pyramid of 70mm high and side of base 30mm when one triangular face of the pyramid is vertical.	5M	BTL1
8.B	Draw the projections of a pentagonal pyramid of base 25mm side and axis 60mm height, when it is lying on the ground on one of its base edges, such that the axis is parallel to VP and inclined at $30^{\circ}$ to HP	5M	BTL2

(OR)

9.	A cube of side 40mm rests on one of its corners on HP such that the two sides containing the corner on which it rests are equally inclined to HP. Draw the projections when the square face containing the corner on which it rests is inclined at $40^{\circ}$ to HP	10M	BTL1
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## SECTION – V

10.	A right circular cone of diameter of base 50mm and height 75mm rests on the top of the frustum of a square pyramid having dimensions of top and bottom square faces as 70mm and 80mm respectively. The height of frustum is 50mm. Draw the Isometric projection of the combined solid when the axes of the solids are coaxial.	10M	BTL1
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(OR)

11.A	A sphere of diameter 30mm rests on the frustum of a hexagonal pyramid of base 30mm, top face 18mm side such that their axes coincide. Draw the isometric projection of the combined solid.	5M	BTL1
11.B	A regular pentagonal prism of base edge 30mm and axis 70mm is mounted centrally over a cylinder block of 80mm diameter and 25mm thick. Draw the Isometric projection of the combined solid.	5M	BTL2



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### B.TECH I YEAR I SEMESTER REGULAR EXAMINATIONS, JANUARY-2024

#### ENGLISH

(COMMON TO EEE,ECE,CSE-DS,CSE-IOT,CSIT,IT)

[Time: 3 Hours]

[MaxMarks: 60]

#### PART – A

(10x 1 = 10M)

- Note: 1. This Part consists of 10 QUESTIONS  
2. Answer All Questions. Each question carries 1Mark.

1.	A	According to Raman, why is the sea blue in colour?	1M	BTL6
	B	Define Cohesion and Coherence	1M	BTL1
	C	What are rock-cut temples? Write about rock-cut and free-standing temples architecture?	1M	BTL1
	D	Write the main features of Résumé?	1M	BTL4
	E	What are the steps in manufacturing denim fabric?	1M	BTL3
	F	Write all the Sub-skills of Reading.	1M	BTL1
	G	What did you learn from the lesson 'What Should You be Eating ' Pyramid' in detailed.	1M	BTL6
	H	What happens in the body when you consume sugary drinks?	1M	BTL1
	I	What are the factors that helped to make Ms. Zhou successful?	1M	BTL1
	J	How to improve critical thinking skills?	1M	BTL2

#### PART – B

(5 x 10 = 50M)

- Note: 1. This Part consists of 10 QUESTIONS  
2. Answer any 1 question from each Section. Each question carries 10 Marks.  
3. Illustrate your answers with NEAT sketches wherever necessary.

#### SECTION - I

2.A	Write about the Raman Effect in detailed.	5M	BTL2
2.B	What is the difference between 'a' and 'an'? The use of indefinite articles and definite articles?	5M	BTL3

(OR)

3.A	Give an account of C.V. Raman's contribution to science.	5M	BTL2
3.B	Explain the techniques of effective writing.	5M	BTL3

#### SECTION - II

4.A	How did the Gandhara style emerge? Discuss its characteristics with illustrations	5M	BTL3
4.B	Draft a Letter to The Mac-Milan Book publisher, New Delhi enquiring if copies of the books prescribed in your syllabus are available with them.	5M	BTL5

(OR)

5.A	What are rock-cut temples? Name some famous rock-cut temples.	5M	BTL2
5.B	Write your Résum� for the position of Sr. Designing Engineer at Infosys, Hyderabad	5M	BTL2

## SECTION - III

6.A	How were the Blue Jeans invented? Discuss its manufacturing process in detailed.	5M	BTL3
6.B	Write ONE-WORD substitutions for the following expressions: 1. One who knows everything. 2. Remedy for all diseases. 3. More than sufficient. 4. A thing which can be easily carried by hand. 5. Able to live both on land and in water. 6. A cage or box to keep birds. 7. A place where ships are loaded. 8. The system of being married only once in life. 9. State of being unmarried.	5M	BTL2

(OR)

7.A	Write all the steps in manufacturing denim fabric in detail?	5M	BTL2
7.B	Write about the importance reading skills and what are the sub-skills of of reading.	5M	BTL2

## SECTION – IV

8.A	Write a detailed note on, ‘The Importance Of Personal Hygiene And Healthy Food habits’.	5M	BTL2
8.B	Write an essay on ‘ Ethical Use of Digital Technology’.	5M	BTL3

(OR)

9.A	What did you learn from the lesson 'What Should You be Eating ' Pyramid' detailed.	5M	BTL2
9.B	Write an essay on ‘The system of Indian Education in the present scenario’	5M	BTL3

## SECTION – V

10.A	Who is the world’s richest self-made woman? What is the name of the company she started?	5M	BTL4
10.B	What are the essential elements of Essay-Writing and how many types of essays?	5M	BTL3

(OR)

11.A	Bring out an assessment of Ms. Zhou’s personality traits.	5M	BTL5
11.B	Describe your favorite location in your own words.	5M	BTL3

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### B.TECH I YEAR I SEMESTER REGULAR EXAMINATIONS, JANUARY-2024

#### LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS

(COMMON TO ALL)

[Time: 3 Hours]

[Max. Marks: 60]

PART – A

(10x 1 = 10M)

- Note:** 1. This Part consists of 10 QUESTIONS  
2. Answer **All Questions**. Each question carries 1Mark.

1	A	Make use this information and give the answer. If $A$ is symmetric matrix, prove that $KA$ is symmetric	1M	BTL3
	B	Find the adjoint of $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$	1M	BTL2
	C	Find the sum and product of the eigen values of the matrix $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & 1 \\ 3 & 1 & 1 \end{bmatrix}$	1M	BTL2
	D	State the Cayley-Hamilton theorem	1M	BTL2
	E	Find the general solution of the equation $\frac{dy}{dx} = \cos(x + y)$	1M	BTL2
	F	Identify the solution of the equation $x \frac{dy}{dx} + y = 0$ passing through the point (1,1)	1M	BTL3
	G	$\frac{1}{D^2-1} e^x = ?$	1M	BTL2
	H	Find the complementary function of $(D^3 + 1)y = 0$	1M	BTL2
	I	Use, $x = r \cos \theta$ , $y = r \sin \theta$ , then $J \left( \frac{x,y}{r,\theta} \right)$	1M	BTL2
	J	Find the stationary points of $x^3y^2(1 - x - y)$	1M	BTL2

PART – B

(5 x 10 = 50M)

- Note:** 1. This Part consists of 10 QUESTIONS  
2. Answer any 1 question from each Section. Each question carries 10 Marks.  
3. Illustrate your answers with NEAT sketches wherever necessary.

#### SECTION - I

2.A	Identify the rank of the matrix $A$ by converting into normal form, where $A = \begin{bmatrix} 1 & -1 & -1 \\ 1 & 1 & 1 \\ 3 & 1 & 1 \end{bmatrix}$ .	5M	BTL3
2.B	Examine whether the following system of equations consistent or not? If so solve them $x+y+2z+w=5$ , $2x+3y-z-2w=2$ , $4x+5y+3z=7$	5M	BTL3

(OR)

3.A	By reducing matrix $A = \begin{bmatrix} 1 & 2 & -1 & 3 \\ 4 & 1 & 2 & 1 \\ 3 & -1 & 1 & 2 \\ 1 & 2 & 0 & 1 \end{bmatrix}$ in to normal form, determine the rank of A.	5M	BTL3
3.B	Solve the following system of non-homogenous linear equation by Gaussian elimination method.	5M	BTL3

	$2x_1 + x_2 + 2x_3 + x_4 = 6, 6x_1 - 6x_2 + 6x_3 + 12x_4 = 36,$ $4x_1 + 3x_2 + 3x_3 - 3x_4 = -1, 2x_1 + 2x_2 - x_3 + x_4 = 10$		
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## SECTION - II

4.A	Find the eigen values and eigen vectors of $A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$	5M	BTL2
4.B	Verify Cayley-Hamilton theorem for A and hence find $A^{-1}$ and $A^4$ . Where $A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ 2 & -4 & -4 \end{bmatrix}$	5M	BTL3

(OR)

5.	Reduce the quadratic form in to canonical form by orthogonal transformation method of $3x^2 + 5y^2 + 3z^2 - 2xy + 2xz - 2yz$ .	10M	BTL3
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## SECTION - III

6.A	Solve $\cos x \, dy = y(\sin x - y)dx$	5M	BTL3
6.B	Make use of the following information and give correct answer. If the surroundings are maintained at $30^\circ\text{C}$ and the temperature of the body cools from $80^\circ\text{C}$ to $60^\circ\text{C}$ in 12 minutes., find the temperature of body after 24 minutes	5M	BTL3

(OR)

7.A	Solve $(3y^2 + 4xy - x)dx + x(x + 2)dy = 0$	5M	BTL3
7.B	Solve $xy(y')^2 + (x^2 + xy + y^2)y' + x^2 + xy = 0$ by the method of solvable by $p$ type.	5M	BTL3

## SECTION - IV

8.A	Solve the differential equation $(D^3 + 4D)y = 5 + \sin 2x$	5M	BTL3
8.B	Solve the differential equation $(D^2 - 6D + 13)y = 8e^x \sin 2x$	5M	BTL3

(OR)

9.A	Solve the differential equation $(D^3 - 3D^2 + 3D - 1)y = x^3$	5M	BTL3
9.B	Apply the method of variation of parameter to solve the differential equation $(D^2 + 1)y = \sec^2 x$	5M	BTL3

## SECTION - V

10.A	Make use of $x^x y^y z^z = e$ and show that at $x = y = z, \frac{\partial^2 z}{\partial x \partial y} = -(x \log_e x)^{-1}$	5M	BTL3
10.B	Show that the functions $u = x + y + z, v = x^2 + y^2 + z^2 - 2xy - 2yz - 2zx$ and $w = x^3 + y^3 + z^3 - 3xyz$ are functionally related	5M	BTL3

(OR)

11.A	Verify Euler's theorem for $z = ax^2 + 2hxy + by^2$	5M	BTL4
11.B	Find the shortest distance from origin to the surface $xyz^2 = 2$	5M	BTL2

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**CODE: 2205ES01****R22****SET - 1**

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### B.TECH I YEAR I SEMESTER REGULAR EXAMINATIONS, JANUARY-2024 PROGRAMMING FOR PROBLEM SOLVING (COMMON TO ALL)

[Time: 3 Hours]

[Max. Marks: 60]

#### PART – A

**(10x 1 = 10M)**

- Note:** 1. This Part consists of 10 QUESTIONS  
2. Answer **All Questions**. Each question carries 1Mark.

1	A	Define Pseudo code.	1M	BTL1
	B	Find $(1256)_{10} = ( )_2$	1M	BTL2
	C	What is the use of the ternary operator?	1M	BTL2
	D	How are strings initialized?	1M	BTL2
	E	Give the importance of scope rules.	1M	BTL3
	F	Define an array.	1M	BTL1
	G	Define a pointer to int.	1M	BTL1
	H	What is the use of free()	1M	BTL2
	I	What is a text file?	1M	BTL1
	J	Define the complexity of an algorithm.	1M	BTL1

#### PART – B

**(5 x 10 = 50M)**

- Note:** 1. This Part consists of 10 QUESTIONS  
2. Answer any 1 question from each Section. Each question carries 10 Marks.  
3. Illustrate your answers with NEAT sketches wherever necessary.

##### SECTION - I

2.A	Explain the types of operators in C.	5M	BTL1
2.B	Write down the steps for program development.	5M	BTL2

(OR)

3.A	What is a computer? Explain the different parts of a computer with a neat sketch.	5M	BTL2
3.B	Draw a flow chart to find the sum of digits of a given number.	5M	BTL4

##### SECTION - II

4.A	Write a program for the diamond star pattern as shown below: * *** ***** ***** ***** ***** ***** ***** *** *	5M	BTL4
4.B	Discuss the use of break and continue in loops.	5M	BTL2

(OR)

5.A	Explain the nested if statement with a suitable example.	5M	BTL3
5.B	Write a program to check whether the given number is Palindrome or not.	5M	BTL4

SECTION - III

6.A	Explain the call-by-value mechanism in functions.	5M	BTL2
6.B	Define the towers of Hanoi problem for 3 discs	5M	BTL3

(OR)

7.A	How are multi-dimensional arrays declared and initialized?	5M	BTL2
7.B	Explain auto and extern storage classes with examples.	5M	BTL2

SECTION – IV

8.A	Create a structure named book with name, author, and publisher as members. Write a program using this structure to read and print data.	5M	BTL4
8.B	Define structures in C. How are they different from unions?	5M	BTL2

(OR)

9.A	What are bit fields? Give its importance.	5M	BTL2
9.B	Define self-referencing structure. How are pointer variables initialized?	5M	BTL3

SECTION – V

10.A	Write an algorithm for bubble sort.	5M	BTL2
10.B	Explain the use of fseek () and ftell() with suitable examples.	5M	BTL4

(OR)

11.A	Write about different file opening modes.	5M	BTL2
11.B	Discuss different file handling functions in C.	5M	BTL3

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