Code No: **R231103** **R23** **SET - 1**

I B. Tech I Semester Supplementary Examinations, June/July-2024
CHEMISTRY
(Common to EEE, CSE)

Time: 3 hours Max. Marks: 70

*Note: 1. Question paper consists of two parts (**Part-A** and **Part-B**)*
*2. All the questions in **Part-A** is Compulsory*
*3. Answer **ONE** Question from each Unit in **Part-B***

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PART –A (20 Marks)

1.	a)	Discuss De Broglie's hypothesis.	[2M]
	b)	What is bond order? Calculate the bond order of N_2^+.	[2M]
	c)	Describe the classification of Nano materials.	[2M]
	d)	Explain the terms semiconductors and super capacitors.	[2M]
	e)	What is a primary cell? Draw the diagrammatic representation of the primary cell.	[2M]
	f)	Write the Nernst equation and elaborate its various parts.	[2M]
	g)	Give a note on thermoplastics.	[2M]
	h)	Explain the term conducting polymers and give an example of a conducting polymer.	[2M]
	i)	What is the electromagnetic spectrum? Mention the various regions of it.	[2M]
	j)	Write any four applications of HPLC.	[2M]

PART – B (50 MARKS)

UNIT-I

2.	a)	Discuss Schrödinger wave equation.	[5M]
	b)	Draw and explain the molecular orbital diagram of O_2 molecule.	[5M]

(OR)

3	a)	Explain the linear combination of atomic orbitals (LCAO).	[5M]
	b)	Discuss the π-molecular orbitals of butadiene.	[5M]

UNIT-II

4.	a)	Provide a note on carbon nanotubes.	[5M]
	b)	Discuss the classification and applications of superconductors.	[5M]

(OR)

5.	a)	Give a note on the types and applications of super capacitors.	[5M]
	b)	Explain various types of semiconductors.	[5M]

UNIT-III

6.	a)	Provide a note on potentiometric titrations.	[5M]
	b)	Give a detailed note on zinc-air batteries.	[5M]

(OR)

7.	a)	Discuss electrochemical sensors.	[5M]
	b)	Explain polymer electrolyte membrane fuel cells.	[5M]

UNIT-IV

8.	a)	Discuss the step growth and chain growth polymerization with suitable examples.	[5M]
	b)	Provide a note on the preparation, properties and applications of teflon.	[5M]

(OR)

9.	a)	Explain the preparation of Buna-N, and discuss its properties, and applications.	[5M]
	b)	Provide a note on bio-degradable polymers.	[5M]

UNIT-V

10.	a)	Write the basic principle and classification of chromatography.	[5M]
	b)	Discuss the fundamental modes and selection rules of IR spectra.	[5M]

(OR)

11.	a)	Describe the instrumentation of IR spectroscopy.	[5M]
	b)	Derive Beer-Lambert's law.	[5M]

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Code No: **R231110** **R23** **SET - 1**

I B. Tech I Semester Supplementary Examinations, June/July-2024
ENGINEERING GRAPHICS

(Common to CE, ME, ECE, IT, AME, Mining, Robotics, Agri E, ECE-Allied, CSE-Allied)

Time: 3 hours Max. Marks: 70

Answer any FIVE Questions ONE Question from Each Unit
All Questions Carry Equal Marks

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UNIT - I

1. a) Construct an ellipse when the distance of focus from the directrix is equal to 80 mm and eccentricity is 2/3. [7M]

   b) Construct a scale of 1:40 to read metres and decimeters and long enough to measure up to 6 metres. Mark a distance of 4.7 m on it. [7M]

(OR)

2. a) A thin circular disc of 50 mm diameter is allowed to roll without slipping from upper edge of sloping plank which is inclined at 15^0 with the horizontal plane. Draw the curve traced by the point on the circumference of the disc. [7M]

   b) A cube of 5 cm side represents a tank of 1000 cubic metres volume. Find the R.F. and construct a scale to measure up to 35 m. Mark a distance of 27 m on it. [7M]

UNIT– II

3. A line PQ measures 70 mm. projector through its V.T. and the end P are 40 mm apart. The end P is 30 mm above the H.P. and 40 mm in front of the V.P. the V.T is 10 mm above the H.P. Draw the projections of the line PQ determine its inclinations with the H.P. and the V.P. Also, locate the H.T. [14M]

(OR)

4. A thin square plate of side 40 mm stands on a corner in the V.P. such that front view appears as a rhombus of diagonals in the ratio of 1:2. Draw its projections when the longer diagonal is parallel to both the principal planes. [14M]

UNIT– III

5. A pentagonal prism of base side 25 mm and axis 60 mm has its axis inclined at 60^0 to the H.P. and $30^0$to the V.P. The farthest shorter edge is parallel to and 90 mm above the H.P. while the nearest corner is 10 mm in front of the V.P. Draw its projections. [14M]

(OR)

6. A cone of base diameter 60 mm and axis 80 mm rests on a point of its base circle on the ground with a generator normal to the H.P. Draw its projections when the plan of the axis is inclined at $30^0$to the V.P. [14M]

UNIT– IV

7. A pentagonal pyramid of base side 30 mm and axis 60 mm is on a triangular face in the H.P. with its axis parallel to the V.P. It is cut by a plane inclined at $60^0$to the H.P. and passing through the highest point of the base. Draw its sectional top view and true shape of the section. [14M]

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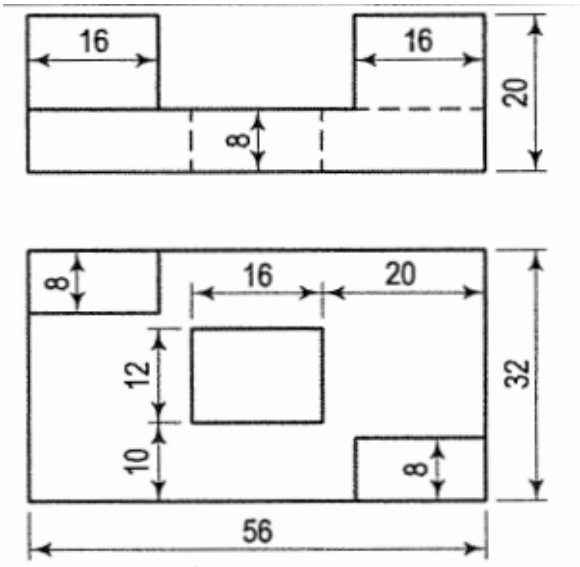
(OR)

8. A hexagonal prism of base side 30 mm and axis 70 mm is resting on its base on the ground with a side of base inclined at $45^0$to the V.P. It is cut by a plane inclined at $45^0$to the H.P. and passes through a point 15 mm below the top end of the axis. Draw the development of the lateral surface of the truncated prism. [14M]

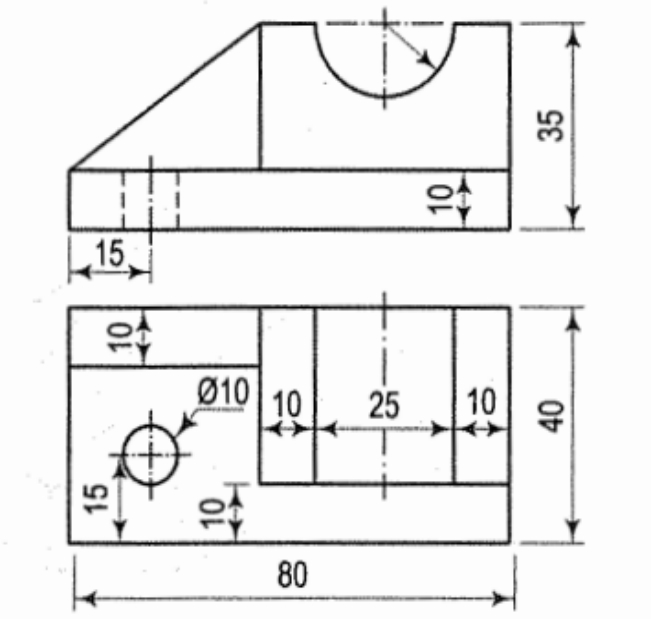
UNIT– V

9. Draw the isometric view of the following component in first angle projection. Take all dimensions are in mm. [14M]



(OR)

10 Draw the isometric view of the casting shown in two views in the figure. All dimensions are in mm. [14M]



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Code No: **R201117** **R20** **SET - 1**

I B. Tech I Semester Supplementary Examinations, June/July-2024
APPLIED PHYSICS

(Common to CSE, CSE-CS&T, IT , CSE-CS, CSE-IOT&CS incl BCT, CSE-CS & BS, CSE-IOT, CS,IOT)

Time: 3 hours Max. Marks: 70

Answer any FIVE Questions ONE Question from Each Unit
All Questions Carry Equal Marks

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UNIT-I

1. a) With ray diagram discuss the theory of thin films and the conditions for constructive and destructive interference in the case of reflected system. [7M]
   b) What is a wave plate? Explain about quarter and half wave plate. [7M]

(OR)

2. a) Explain the theory of Fraunhofer diffraction due to 'n' slits. [7M]
   b) Write Fresnel explanation of diffraction phenomenon. Distinguish between Fresnel and Fraunhofer diffraction. [7M]

UNIT-II

3. a) Explain spontaneous and stimulated emission of radiation with neat energy level diagrams [7M]
   b) Discuss construction and working principle of He-Ne laser with suitable diagram. [7M]

(OR)

4. a) Explain different modes of propagation of light in optical fibers. [7M]
   b) Explain the principle of an optical fiber. Classify optical fibers based on their refractive index profile. [7M]

UNIT-III

5. a) Obtain Schrodinger's time independent wave equation for a free particle. [7M]
   b) State de-Broglie hypothesis. Derive an expression for de-Broglie wavelength and using it show that an electron accelerated by a potential difference V volt is $\frac{12.27}{\sqrt{V}}$is **Å** [7M]

(OR)

6. a) Explain the motion of electron in a periodic potential. [7M]
   b) Write a note on Fermi energy. How is Fermi surface formed in the case of metals? Explain. [7M]

UNIT-IV

7. a) Obtain the expression for internal field inside a dielectric when it is placed in an electric field. [10M]
   b) Write a short note on piezoelectricity. [4M]

(OR)

8. a) Explain in detail the origin of magnetic dipoles in matter. [7M]
   b) Compare the properties of Dia, Para, and Ferromagnetic materials. [7M]

UNIT-V

9. a) Derive an expression for electron concentration in an intrinsic semiconductor. [7M]
   b) Distinguish between intrinsic and extrinsic semiconductors. Explain their structural difference with suitable diagrams. [7M]

(OR)

10. a) Explain in detail AC and DC Josephson effects. [7M]
    b) Distinguish between hard and soft superconductors. [7M]

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Code No: **R161107** **R16** **SET - 1**

I B. Tech I Semester Supplementary Examinations, June/July-2024

COMPUTER PROGRAMMING

(Common to ECE, Aero E, Auto E, Bio-Tech, Chem E, CE, CSE, IT, EIE, EEE, ME, Metal E, Min E, P Chem E, PE, E Com E)

Time: 3 hours Max. Marks: 70

*Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)*
*2. Answering the question in **Part-A** is Compulsory*
*3. Answer any **FOUR** Questions from **Part-B***

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PART –A (14 Marks)

1. a) Differentiate between high-level and low-level programming languages. [2M]
   b) Write the prototype of main() function in C programming. [2M]
   c) Specify the significance of break and default statements in switch. [2M]
   d) What is Dangling pointer in C programming? [2M]
   e) Draw the memory representation of one and two-dimensional arrays in C programming. [2M]
   f) Can a structure point to itself? Justify your answer. [2M]
   g) How do you declare and open a file pointer in C for writing a text file? [2M]

PART –B (56 Marks)

2. a) Explain the features of Object Oriented Programming with suitable examples. [7M]
   b) Define Algorithm. Write an algorithm to find the roots of a quadratic equation. [7M]
3. a) Demonstrate the purpose of precedence and Associativity rules in executing an expression with a sample C program. [7M]
   b) Why "&" is not used for strings in scanf() function? Explain in detail the prototype of '*scanf*'' function in C programming, including its argument list and return type. [7M]
4. a) Write a C program to find whether a triangle can be formed or not (The length of three sides are taken as input.). If the triangle can be formed then check whether the triangle is equilateral, isosceles, scalene or a right-angled triangle otherwise display "This Triangle is NOT possible." [7M]
   b) What is the difference between a pretest loop and a posttest loop give an example of each loop? [7M]
5. a) Explain the importance of Scale factor in Pointer arithmetic with an example C program. [7M]
   b) Write a C program to find the HCF of two numbers using recursive functions [7M]
6. a) Write a C program to print lower triangle of a square matrix. For example the output of a given matrix. [7M]

2 3 4	will be	2 0 0
5 6 7		5 6 0
4 5 6		4 5 6

   b) Why is it important to terminate a string in C with the null character? What happens if a string is not null-terminated? Explain. [7M]
7. a) Write a C program to access the values of an array of characters using pointer. [7M]
   b) Write a C program to add two distances given as input in feet and inches using structures. (*Hint*: One feet = 12 inches). [7M]

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