Code No: **R231204** **R23** **SET - 1**

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

ENGINEERING GRAPHICS

(Common to CSE, EEE, Ph. E.)

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. Draw a hyperbola when the distance of the focus from the directrix is 70 mm and the eccentricity 'e' is 1.5. Draw the tangent and normal to the curve at a point P distance 50 mm from the directrix. [14M]

(OR)

2. Construct a diagonal scale showing kilometer, hectometer and decameter in which a 2 cm long line represents 1 km and the scale is long enough to measure up to 7 km. Find R.F. and mark 4 km 5 hm and 3 dm on it. [14M]

UNIT - II

3. a) A point 30mm above XY line is the front view of two points A& B. The top view of A is 40 mm behind VP and the top view of B is 45 mm front of VP draw the projection of the points and state the quadrants in which the points are situated. [7M]

   b) The distance between the projectors through the VT and the HT of a line PQ is 70 mm and that between the projectors through the ends is 40 mm. The VT is 45 mm above the HP and HT is 30 mm in front of the V P. P is 15 mm above the HP. Draw the front and top views of the line. Also find the true length and true inclinations of the line with HP and VP. [7M]

(OR)

4. a) A point P is on HP and 30 mm in front of VP. Another point Q is on VP and below HP. The line joining their front views makes an angle of 30° to XY line while the line joining their top views makes an angle of 45° with XY line. Find the distance of the point Q from HP. [7M]

   b) A straight-line AB of length 100 mm has its end A 10 mm in front of VP and B 20 mm above HP. The front view and top view of the line measure 80 mm and 60 mm respectively. Draw the projections of the line and obtain the true angles of inclination with HP and VP. [7M]

UNIT - III

5. Draw the projections of a hexagonal pyramid of side of base 30mm and axis 60mm long resting on one of its base edges in H.P with its axis inclined at 30^0 to H.P. and the top view of axis is 45^0 to V.P. [14M]

(OR)

6. A solid cylinder of diameter 60 mm and 80 mm axis length is lying on horizontal plane with its one of the circumferential line on HP and the axis makes 30^0 to VP. Draw the projections. [14M]
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Code No: **R231204** **R23** **SET - 1**

UNIT – IV

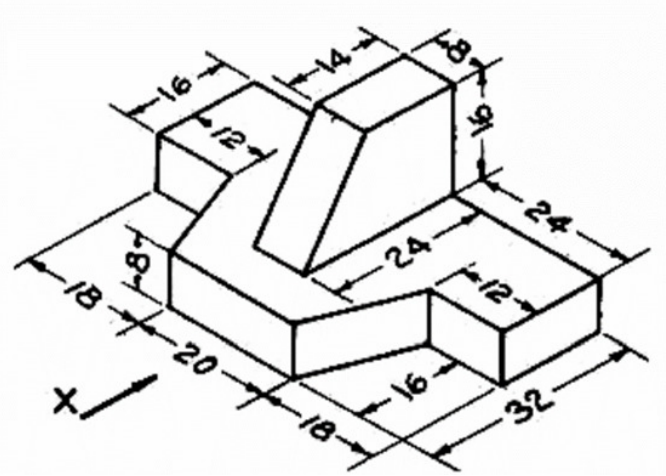
7. A hexagonal prism of base 30mm and axis 60mm rests on its base on HP with its axis perpendicular to HP and one of the base edge parallel to VP. The solid is cut by a plane which is perpendicular to VP, inclined at 40˚ to HP and bisecting the axis of the prism. Draw the front view, sectional top view and true shape of the section. [14M]

(OR)

8. A cylinder of base diameter 40mm and height 65mm rests on its base on HP. It is cut by a plane perpendicular to VP and inclined at 30° to HP and meets the axis at a distance 30mm from the base. Draw the development of the lateral surface of the Cylinder. [14M]

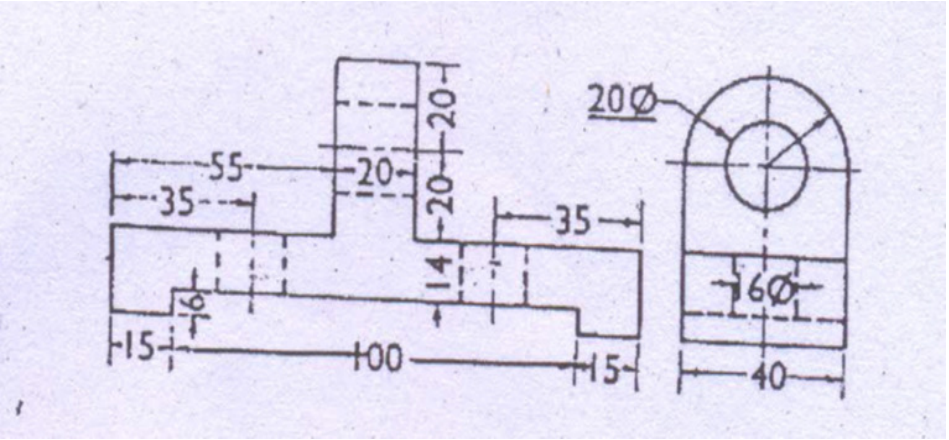
UNIT - V

9. Draw the following views of the block shown in figure. All dimensions are in mm. a) Front View b) Top View c) Right side view. [14M]



(OR)

10 Draw the isometric view of the solid shown below : [14M]



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Code No: **R231204** **R23** **SET - 2**

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

(Common to CSE, EEE, Ph.E.)

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. The major axis of an ellipse is 120mm long and the foci are at a distance of 20mm from its ends. Draw the ellipse using one-half of it by concentric circles method and the other half by rectangle method. [14M]

(OR)

2. The distance between two stations by road is 200 km and it is represented on a certain map by a 5 cm long line. Find the R. F. and construct a diagonal scale showing a single kilometer and long enough to measure up to 600 km. Show 467 km on this scale. [14M]

UNIT - II

3. a) Mark the projections of the following points on a common reference line: [7M]
P, 35 mm behind the VP and 20 mm below the HP.
O, 40 mm in front of VP and 30 mm above the HP.
R, 50 mm behind the VP and 15 mm above the HP.
S, 40 mm below the HP and in the VP.

   b) A point C is on HP and 15 mm behind VP. Another point D is also on HP and 40 mm in front of VP. The distance between their projectors is 45 mm. Join their front views and determine inclination of this line with XY line. [7M]

(OR)

4. The point B of a line AB is on the horizontal plane, the top view of the line makes an angle of 30° with XY line, being 80mm. The point A is on the vertical plane and 50mm above the horizontal plane. Draw the top and front views of the line and obtain the true length of the line. Also find the inclinations of the line with the two planes. [14M]

UNIT - III

5. A hexagonal pyramid base 25 mm side and axis 55 mm long has one of its slant edges on the ground. A plane containing that edge and the axis is perpendicular to the H.P and inclined at 45^0 to the V.P. Draw its projections when the apex is nearer the V.P than the base. [14M]

(OR)

6. A right pentagonal pyramid of base side 20mm and altitude 60mm rests on one of its edges of the base in HP, the base being tilted up until the highest corner in it is 30mm above HP. Draw the elevation of the pyramid when the edge on which it rests is made perpendicular to VP. [14M]

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Code No: **R231204** **R23** **SET - 2**

UNIT – IV

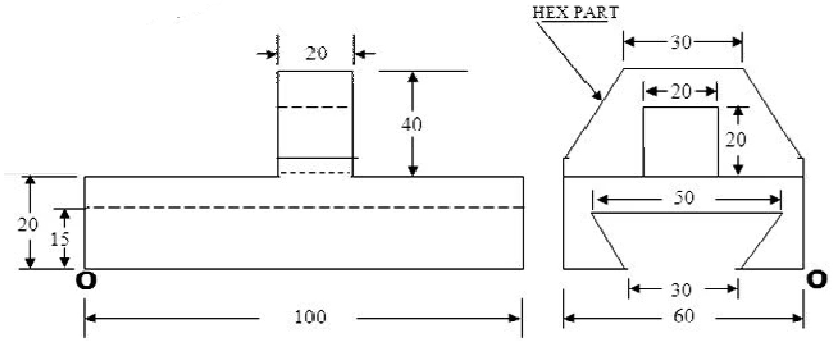
7. A cone of base diameter 40mm and altitude 50mm rests on its base on the HP. It is cut by a plane inclined at 45° to HP and passes through a point on axis which is20mm above HP. Draw the front view, sectional top view and true shape of the section. [14M]

(OR)

8. A square pyramid has a base side of 40mm and altitude 80mm. It rests with its base on HP such that one side of the base is inclined at 30° to VP. The pyramid is cut by a plane which bisects the axis and is inclined at 45° to HP. Draw the development of the remaining portion of the pyramid. [14M]

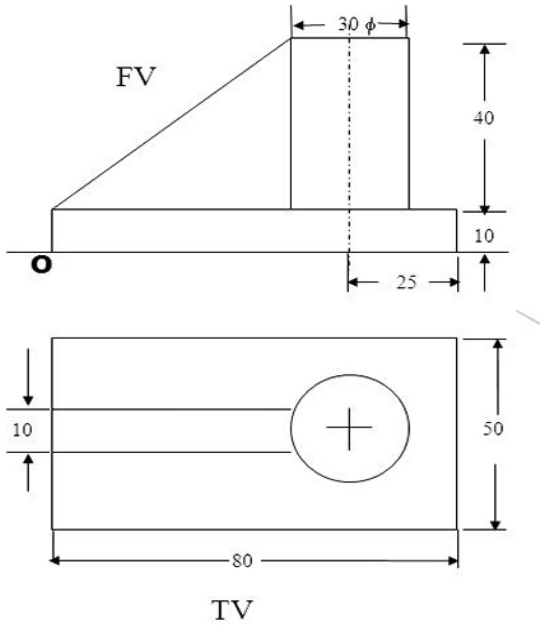
UNIT– V

9. Draw the front, top and right-side views of the object shown in Figure. All dimensions are in mm [14M]



(OR)

10 Draw the isometric view of the solid shown below: All dimensions are in mm. [14M]



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Code No: **R231204** **R23** **SET - 3**

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

(Common to CSE, EEE, Ph.E.)

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. Construct a hyperbola when the distance between the focus and directrix is 45 mm and eccentricity is 5/4. Also draw the tangent and normal to any point on the curve. [14M]

(OR)

2. The distance between two stations is 130km. a train covers this distance in 2.5 hours. Construct a plain scale to measure time up to a single minute. The RF of the scale is 1:260000. Find the distance covered by the train in 45 minutes. [14M]

UNIT– II

3. a) The plan of the point P lies 40 mm above the reference line xy and its elevation 50 mm above the reference line xy. Mention the quadrant in which the point is situated. Draw its projections and find the shortest distance of the point from the intersection of the HP and VP. [7M]

   b) A line PQ of 70 mm length is parallel to and 15 mm in front of the VP. Its ends P and Q are, respectively, 20 mm and 70 mm above HP. Draw its projections and find its inclination with the HP. [7M]

(OR)

4. End projectors of a straight-line AB are 60 mm apart. Ends A and B are, respectively, 25 mm and 50 mm above the HP; and 35 mm and 50 mm in front of the VP. A point C, 55 mm from A and 65 mm from B, lies in the HP. Draw the projections of straight lines AB, BC, and CA and determine the distance of point C from VP. [14M]

UNIT– III

5. A pentagonal prism 25mm sides of base and 60mm axis length is suspended freely from one of its corners. Draw the projections of prism when the axis appears to be inclined to VP at 45º. [14M]

(OR)

6. A cylinder of base diameter 50mm and axis height 65mm is resting on HP on a point on the circumference of the base with its axis inclined at 50º to HP and parallel to VP. Draw its projections. [14M]

UNIT– IV

7. A hexagonal pyramid of base 35mm and axis 70mm is resting on HP on its base with two sides of base perpendicular to VP. It is cut by a plane inclined at 45° to VP, perpendicular to HP and 10mm away from the axis. Draw its top view, sectional front view and true shape of the section. [14M]
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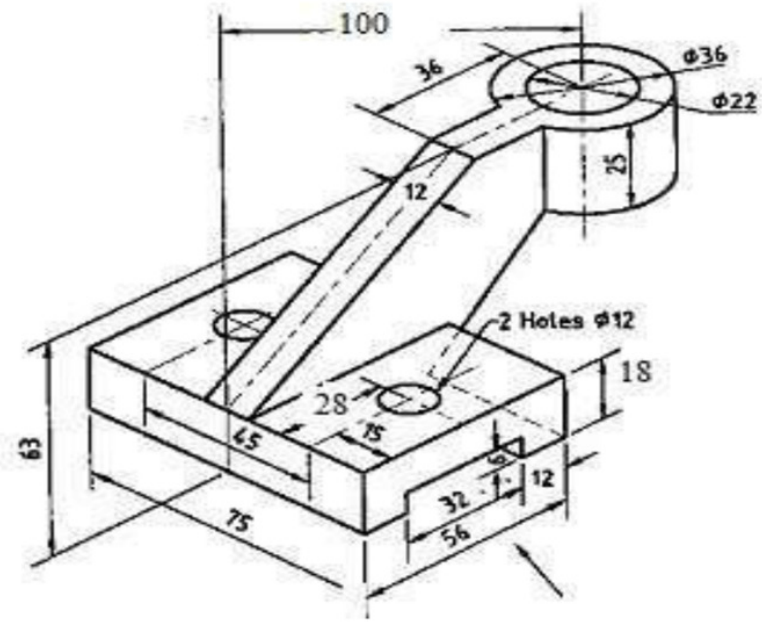
(OR)

8. A square pyramid has a base side of 40mm and altitude 80mm. It rests with its base on HP such that one side of the base is inclined at 30° to VP. The pyramid is cut by a plane which bisects the axis and is inclined at 45° to HP. Draw the development of the remaining portion of the pyramid. [14M]

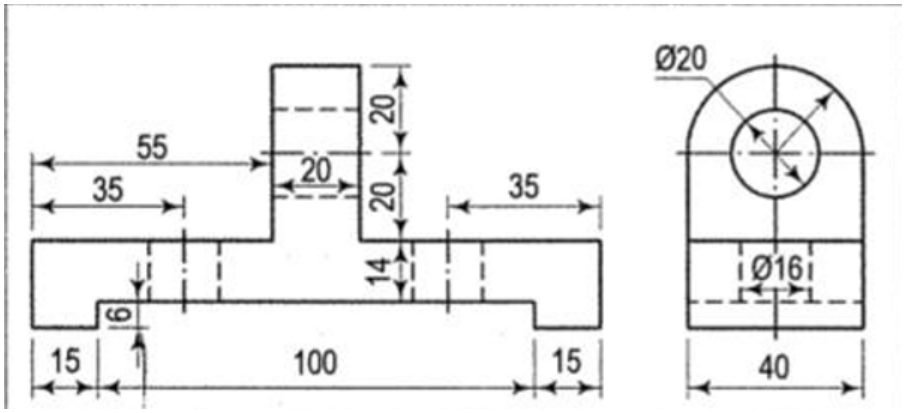
UNIT– V

9. Draw the three orthographic views for the following figure. All dimensions are in mm. [14M]



(OR)

10 Draw the isometric view of the solid shown below: [14M]



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Code No: **R231204** **R23** **SET - 4**

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

(Common to CSE, EEE, Ph.E.)

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 circle of 40 mm diameter rolls outside and along another fixed circle of 120 mm diameter. Draw the locus of a point lying on the circumference of the rolling circle. Name the curve. Draw the normal and tangent to the curve at any convenient point. [14M]

(OR)

2. a) Construct a diagonal scale of RF 1/24, capable of reading 4 yards and showing yards, feet and inches. Show on it the length 3 yards, 2 feet and 10 inches. [7M]

   b) Construct a vernier scale to read meters, decimeters and centimeters and long enough to measure upto 4m. The RF of the scale is 1/20. Mark on it a distance of 2.28 m. [7M]

UNIT - II

3. a) Two points A and B are in the H.P. the point A is 30 mm in front of the VP. While B is behind the V.P. The distance between their projections is 75 mm and line joining their top views makes an angle of 450 with xy. Find the distance of the point B from the V.P. [7M]

   b) The distance between the projectors through the VT and the HT of a line PQ is 70 mm and that between the projectors through the ends is 40 mm. The VT is 45 mm above the HP and HT is 30 mm in front of the V P. P is 15 mm above the HP. Draw the front and top views of the line. Also find the true length and the true inclinations of the line with the HP and the VP. [7M]

(OR)

4. A pentagonal plane lamina of sides 40 mm is resting on the ground on one of its corners so that surface makes an angle of 45 degrees with the HP. If the side opposite to this corner makes an angle of 45 degrees with the VT, draw the front view and top view of the pentagon. [14M]

UNIT - III

5. A right pentagonal pyramid of base side 20mm and altitude 60mm rests on one of its edges of the base in HP, the base being tilted up until the highest corner in it is 30mm above HP. Draw the elevation of the pyramid when the edge on which it rests is made perpendicular to VP. [14M]

(OR)

6. Draw the projections of a hexagonal pyramid of side of base 30mm and axis 60mm long resting on one of its base edges in H.P with its axis inclined at 30^0 to H.P. and the top view of axis is 45^0 to V.P. [14M]
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Code No: **R231204** **R23** **SET - 4**

UNIT – IV

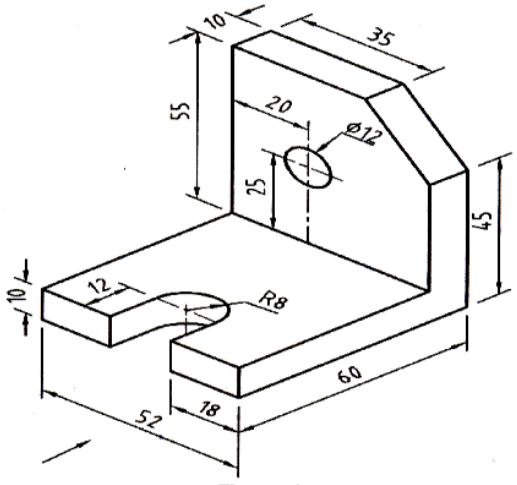
7. A hexagonal pyramid of base 35mm and axis 70mm is resting on HP on its base with two sides of base perpendicular to VP. It is cut by a plane inclined at 45° to VP, perpendicular to HP and 10mm away from the axis. Draw its top view, sectional front view and true shape of the section. [14M]

(OR)

8. A pentagonal pyramid has a base side of 30mm and axis height of 70mm. It rests with its base on HP such that one of the base edges perpendicular to VP. The pyramid is cut by a plane which bisects the axis and is inclined at 30° to HP. Draw the development of the remaining portion of the pyramid. [14M]

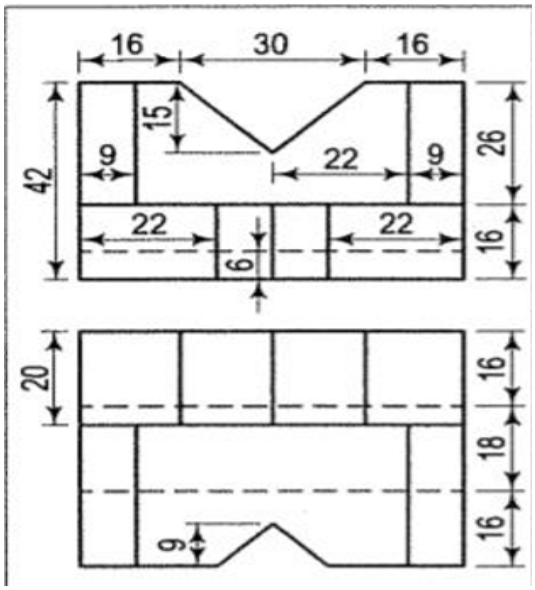
UNIT - V

9. Draw the front, top and right side views of the object shown. [14M]



(OR)

10 Draw the isometric view of the solid shown below: [14M]



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Code No: **R231209** **R23** **SET - 1**

I B. Tech II Semester Regular Examinations, June/July-2024
CHEMISTRY

(Common to ECE, IT, CSE-Allied)

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)	Give the Schrodinger wave equation; explain the terms in that equation.	[2M]
	b)	Compare bonding and anti bonding orbital.	[2M]
	c)	Give the applications of super capacitors.	[2M]
	d)	Give the examples of two and three dimension Nano materials.	[2M]
	e)	What is electrochemical cell? Give example.	[2M]
	f)	Compare potentiometry with conductometry.	[2M]
	g)	What are the monomers can proceed for condensation reaction, Why?	[2M]
	h)	What are the applications of rubbers?	[2M]
	i)	What are the applications of UV -Visible spectroscopy?	[2M]
	j)	What is absorption of radiation?	[2M]

PART – B (50 MARKS)

UNIT-I

2.	a)	Explain and compare significance of Ψ and Ψ^2.	[5M]
	b)	Draw energy level diagram of oxygen molecule, calculate bond order.	[5M]
		(OR)	
3	a)	Describe pi molecular orbitals of butadiene in detail.	[5M]
	b)	Arrange the increasing order of Bond orders of N_2, N_2^+, N_2^{2+}, N_2^- and N_2^{2-}	[5M]

UNIT-II

4.	a)	Define semiconductors, Explain types of semiconductors.	[5M]
	b)	Give the properties and applications of nano tubes.	[5M]
		(OR)	
5.	a)	Classify super capacitors, give its importance.	[5M]
	b)	Explain the properties of graphines and its importance.	[5M]

UNIT-III

6.	a)	Derive Nernst Equation. How cell potential will be calculated? Explain.	[5M]
	b)	Describe Lithium ion battery.	[5M]
		(OR)	
7.	a)	Explain redox titrations with examples.	[5M]
	b)	What is polymer electrolyte membrane fuel cells, give its importance.	[5M]

UNIT-IV

8.	a)	Explain addition polymerization mechanism by taking suitable example.	[5M]
	b)	Define biodegradable polymer, explain their properties and applications.	[5M]
		(OR)	
9.	a)	Define conducting polymer, give their importance.	[5M]
	b)	Give preparation, properties and applications of Teflon.	[5M]

UNIT-V

10.		Describe IR spectroscopy with block diagram and explain fundamental modes.	[10M]
		(OR)	
11.		What is the basic principle of chromatography, classify chromatographic techniques and applications.	[10M]

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Code No: **R231209** **R23** **SET - 2**

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

CHEMISTRY

(Common to ECE, IT, CSE-Allied)

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)	Define homo and hetero nuclear diatomic molecules, give example.	[2M]
	b)	Give the importance of Schrodinger wave equation.	[2M]
	c)	Give the applications of semiconductors.	[2M]
	d)	Give the examples of two and one dimension Nano materials.	[2M]
	e)	How to differentiate Fuel cell with batteries?	[2M]
	f)	Compare primary and secondary batteries.	[2M]
	g)	What is conducting polymer, give example.	[2M]
	h)	What is the importance of biodegradable polymers?	[2M]
	i)	Draw the electromagnetic spectrum.	[2M]
	j)	What are the fundamental modes?	[2M]

PART – B (50 MARKS)

UNIT-I

2.	a)	Explain postulates of molecular orbital theory.	[5M]
	b)	Arrange the increasing order of Bond orders of O_2, O_2^+, O_2^{2+}, O_2^- and O_2^{2-}	[5M]
		(OR)	
3		Discuss about particle in one dimensional box.	[10M]

UNIT-II

4.	a)	Give a brief note on Type –II super conductors.	[5M]
	b)	Compare fullerenes and Nano tubes.	[5M]
		(OR)	
5.	a)	Write classification and applications of super capacitors.	[5M]
	b)	Define Nano material, explain any two important properties.	[5M]

UNIT-III

6.	a)	Discuss about amperometric sensors with examples.	[5M]
	b)	Describe Zinc air battery.	[5M]
		(OR)	
7.	a)	Explain conductometric acid base titrations.	[5M]
	b)	Explain working principle of the hydrogen – oxygen fuel cell.	[5M]

UNIT-IV

8.	a)	Explain coordination polymerization mechanism by taking suitable example.	[5M]
	b)	Give preparation, properties and applications of Buna-N.	[5M]
		(OR)	
9.	a)	Differentiate addition and condention polymerization.	[5M]
	b)	Give preparation and properties of Nylon 6,6.	[5M]

UNIT-V

10.		Describe UV-Visible spectroscopy with block diagram and Write on electronic transitions.	[10M]
		(OR)	
11.		Explain HPLC instrumentation with block diagram, give their applications..	[10M]

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Code No: **R231209** **R23** **SET - 3**

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

CHEMISTRY

(Common to ECE, IT, CSE-Allied)

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)	What are the advantages of molecular orbital theory?	[2M]
	b)	Compare orbital and node.	[2M]
	c)	Give the applications of superconductors.	[2M]
	d)	Give the examples of zero and one dimension Nano materials.	[2M]
	e)	Give Nernst equation, What are the terms involved in that equation.	[2M]
	f)	Define primary cell, give examples.	[2M]
	g)	What is addition polymerization, give example?	[2M]
	h)	What is the importance of conducting polymers?	[2M]
	i)	Give various types of electronic transitions.	[2M]
	j)	What is Beer-Lambert Law?	[2M]

PART – B (50 MARKS)

UNIT-I

2.	a)	Derive the Schrodinger wave equation for particle in one dimensional box.	[5M]
	b)	Draw energy level diagrams of CO molecule, calculate bond order.	[5M]

(OR)

3		Describe pi molecular orbitals of benzene and 1, 3 butadiene in detail.	[10M]

UNIT-II

4.	a)	Define superconductors, Explain its applications.	[5M]
	b)	Compare graphines and Nano tubes.	[5M]

(OR)

5.	a)	Classify super capacitors, give its applications.	[5M]
	b)	Write engineering applications of fullerenes.	[5M]

UNIT-III

6.	a)	What is potentiometry, explain redox titrations.	[5M]
	b)	Differentiate primary batteries with secondary batteries with examples and explain working principle of Fuel cells.	[5M]

(OR)

7.	a)	Explain conducto metric titrations for strong acid vs strong base with example.	[5M]
	b)	Describe the working principle of PEMFC with neat diagram.	[5M]

UNIT-IV

8.	a)	Explain step growth polymerization mechanism by taking suitable example.	[5M]
	b)	Give brief note on carbon fibres and their important applications.	[5M]

(OR)

9.	a)	Discuss about Polyglycolic acid and Poly lactic acid biodegradable polymers.	[5M]
	b)	Give preparation, properties and applications of PVC.	[5M]

UNIT-V

10.		Describe IR spectroscopy with block diagram and their selection rules.	[10M]

(OR)

11.		Explain Classification and basic working principle of chromatography.	[10M]

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I B. Tech II Semester Regular Examinations, June/July-2024
CHEMISTRY
(Common to ECE, IT, CSE-Allied)

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) Give any two postulates of molecular orbital theory. [2M]
   b) Compare Ψ and Ψ^2. [2M]
   c) Define and classification of superconductors. [2M]
   d) Classify Nano materials. [2M]
   e) Define secondary battery, give example. [2M]
   f) Define conductivity. [2M]
   g) What is functionality of monomer, give example? [2M]
   h) What are the applications of Bakelite? [2M]
   i) Define electromagnetic spectrum. [2M]
   j) What are the applications of IR Spectroscopy? [2M]

PART – B (50 MARKS)

UNIT-I

2. a) Derive the Schrodinger wave equation, explain terms involved in that. [5M]
   b) What are homo nuclear and hetro nuclear diatomic molecules? Explain with examples and draw MO diagram for N_2 molecule. [5M]

(OR)

3 Draw MO diagram and calculate bond orders of CO and O_2 molecules. [10M]

UNIT-II

4. a) Differentiate Semi and Super conductors and write applications of semiconductors. [5M]
   b) Discuss Type-I and Type-II super conductors. [5M]

(OR)

5. a) Explain different types of carbon Nano tubes and their applications. [5M]
   b) Give brief note on graphines. [5M]

UNIT-III

6. a) Give brief note on potentiometric sensors. [5M]
   b) Describe Secondary battery with suitable example and their cell reactions with diagram. [5M]

(OR)

7. a) Explain conducto metric titration of Weak acid with strong base with example. [5M]
   b) Define fuel cell; explain working principle of the H_2 –O_2 fuel cell. [5M]

UNIT-IV

8. a) Explain chain growth polymerization mechanism by taking suitable example. [5M]
   b) Differentiate thermo setting and thermo polymers. [5M]

(OR)

9. a) Explain conducting mechanism in conducting polymers, give their applications. [5M]
   b) Give preparation and properties of Bakelite. [5M]

UNIT-V

10. Explain Instrumentation and applications of UV-Visible spectroscopy. [10M]

(OR)

11. Give brief note on High performance liquid chromatography and their applications. [10M]

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Code No: **R201212** **R20** **SET - 1**

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

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

(Common to ECE, EIE, ECT)

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) Write a JAVA program to generate the first 'n' numbers of Fibonacci series using Loop control structures. [7M]

b) How are Objects created from Class? Explain with a JAVA program. [7M]

(OR)

2 a) Explain the special features of Constructors with a JAVA program. [7M]

b) Write a JAVA program to demonstrate the concept of Method Overloading. [7M]

UNIT-II

3 a) What is meant by Inheritance in JAVA? Discuss its types and benefits. [7M]

b) Explain the steps to invoke super class constructor and methods from subclass. [7M]

(OR)

4 a) How JAVA implements Multiple Inheritance? Explain with suitable JAVA program. [7M]

b) How do you check if an object is an instance of a particular class? Explain with a JAVA program. [7M]

UNIT-III

5 a) How to handle Mouse events in JAVA? Explain the steps with a JAVA program. [7M]

b) What is layout manager? Write a JAVA program to implement Flow layout. [7M]

(OR)

6 a) Discuss the different types of Layout Managers available in JAVA. [7M]

b) Explain the life cycle of an Applet. [7M]

UNIT-IV

7 a) Explain the steps to create the contents of a file using Scanner class with a JAVA program. [7M]

b) Explain any four methods of Random Access File class in JAVA. [7M]

(OR)

8 a) Write a JAVA program to count the number of characters in a text file. [7M]

b) Explain any four Event classes and the respective Listener interfaces in JAVA. [7M]

UNIT-V

9 a) What do you mean by array index out of bounds exception and null pointer exception? Write a JAVA program to handle these two exceptions. [10M]

b) Explain any four methods of java.net.Socket Class. [4M]

(OR)

10 a) Explain the different ways to create Threads in JAVA with appropriate code snippets. [7M]

b) Why we need Collection Framework in JAVA? Discuss the hierarchy of Collection framework. [7M]

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Code No: **R201225** **R20** **SET - 1**

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

PYTHON PROGRAMMING

(Common to CSE, IT, CSE-AI&ML,CSE-AI, CSE-DS, CSE-AI&DS, AI&DS)

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 the help of a neat sketch, explain the program development life cycle. [7M]

b) What is a variable? What rules to be followed to define it? Demonstrate with simple program. [7M]

(OR)

2 a) Using flowchart, syntax and example program, explain any one iterative statement. [7M]

b) Write a python program to find the sum of even and odd numbers present from 9 to 99. [7M]

UNIT-II

3 a) What is a file? Explain its importance in programming language. [7M]

b) Write a Python program to find the number of characters, digits, special symbols and words present in a text file. [7M]

(OR)

4 a) Why we need strings in programming languages? Using Python how can we represent and access the string? Explain. [7M]

b) Write about various string functions and write a program to check whether 'MALAYALAM' string is a palindrome or not. [7M]

UNIT-III

5 a) Lists in Python are mutable. Justify the statement. [7M]

b) Write a python program to find the largest element present in the list. [7M]

(OR)

6 a) "List is a homogeneous or heterogeneous data item" - Discuss. [7M]

b) Explain various built-in functions present in lists. Write a program to illustrate any three. [7M]

UNIT-IV

7 a) In what way overlapping differs from overriding. Discuss. [7M]

b) What is a binary file? How can we read the data present in it? Explain. [7M]

(OR)

8 a) In what way a class differs from package. Explain with example. [7M]

b) Write a python program to demonstrate the working of constructors. [7M]

UNIT-V

9 a) Errors and exception both are same or not. If not in what way they differ. Explain. [7M]

b) How can we define user defined exceptions? Demonstrate with example program. [7M]

(OR)

10 a) Graphical User Interface (GUI) in what way is good compared with Character User Interface (CUI). Explain. [7M]

b) Explain the role of scratch in Python programming. [7M]

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Code No: **R161213** **R16** **SET - 1**

I B. Tech II Semester Supplementary Examinations, June/July - 2024
DATA STRUCTURES
(Common to ECE, EIE, 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) Why do we need to use a sparse matrix instead of a simple matrix? [2M]
   b) What is a Postfix expression explain with example? [2M]
   c) What is the good data structure for representing Equivalence classes? [2M]
   d) State the properties of Binary Search Tree. [2M]
   e) Depict the Preorder tree traversal technique. [2M]
   f) Which data structure is used in BFS implementation? [2M]
   g) Give the Best and Worst case time complexities of Heap Sort. [2M]

PART –B (56 Marks)

2. a) What is an Array ADT? Give its features, real time applications and implementation details. [7M]
   b) Which memory representation is good for polynomials? Give explanation to your answer with suitable examples. [7M]
3. a) Define Stack ADT. Explain its operations with examples. [7M]
   b) Convert the following Infix expression A + B* (C+D) / F + D*E into Prefix expression by explaining each and every step. [7M]
4. a) Explain the steps to perform addition of Polynomials using Linked memory representation. [7M]
   b) Describe all possible operations of Doubly Linked list with neat diagrams. [7M]
5. a) Discuss various Tree traversal techniques with neat diagrams. [7M]
   b) Define Max Heap. Explain the steps involved in building a Max Heap for the following list of elements 5, 7, 9,1,3,10,8,4. [7M]
6. a) How do you represent Graphs using singly linked lists? Explain with example. [7M]
   b) Explain in detail the All Pairs Shortest Path algorithm with an example. [7M]
7. a) Explain the working of Merge Sort algorithm with an example. [7M]
   b) Derive the Space and Time complexities (Best, Average, and Worst) of Merge Sort technique. [7M]

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Code No: **R161216** **R16** **SET - 1**

I B. Tech II Semester Supplementary Examinations, June/July-2024
ENGINEERING MECHANICS
(Common to CSE, IT, Agri. 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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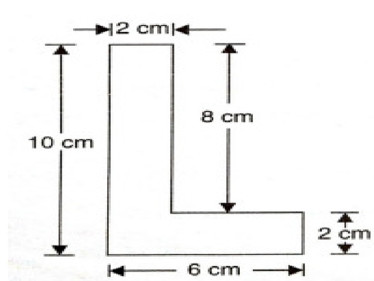
PART –A (14 Marks)

1. a) Define: i. Limiting friction ii. Angle of repose. [2M]
   b) What are the various steps involved in drawing the free body diagram. [2M]
   c) Define the terms centroid and centre of gravity. [2M]
   d) Give the position of centroid of the following standard sections: [2M]
   i. Uniform rod ii. Rectangle.
   e) Define area moment of inertia. [2M]
   f) Define displacement, velocity and acceleration. [2M]
   g) State the work-energy equation for translation. [2M]

PART –B (56 Marks)

2. a) Derive an expression for the resultant in magnitude and direction of two coplanar forces using cosine law method. [6M]
   b) A cord connects two bodies of weight 1000 N and 1200 N. The two bodies are placed on an inclined plane and cord is parallel to the inclined plane. The coefficient of friction for the weight of 1000 N is 0.22 and that of 1200 N is 0.38. Determine the inclination of the plane to the horizontal and tension in the cord when the motion is about to take place, down the inclined plane. The body weighing 1000 N is below the body weighing 1200 N. [8M]
3. a) The x, y and z components of a force are 50 kN, -40 kN and 30 kN respectively. Find the components of force along line joining A(3.4.-2) and B(-3,-4,3). [8M]
   b) Prove that a body will not be in equilibrium when a body is subjected to two forces are equal and opposite but are parallel. [6M]
4. a) Determine the distance of the centroid from the base of triangle of altitude 'H'. [6M]
   b) Determine the centre of gravity of an L section shown below. [8M]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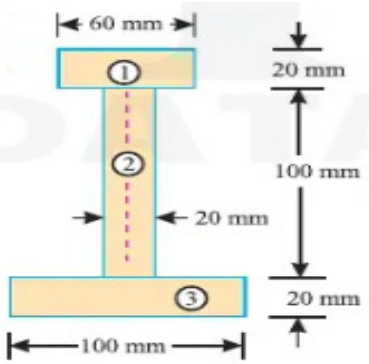
5. a) An I section shown in the figure is made up if three rectangles. Find the moment of inertia of the section about the horizontal axis passing through the centre of gravity of the I section. [7M]

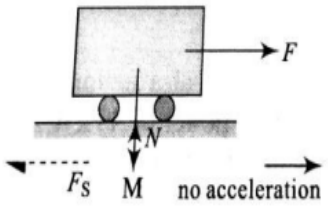


b) Describe the method of finding the moment of inertia of a composite section. [7M]

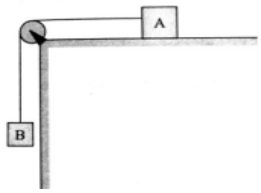
6. a) A body in rectilinear motion is found to travel 25 m in 6th second and 50 m in 12th second. What distance will it travel in 18th second from the starting point if its acceleration is constant throughout? [7M]

b) A wheel accelerates uniformly from rest to a speed of 300 rpm in 3/4 sec. It then rotates at that speed for 2 sec before decelerating to rest in 2/3 sec. How many revolutions does it make during the entire time interval? [7M]

7. a) A train of weight 20,000kg is pulled by an engine on a level track at a constant speed of 62kmph. The frictional resistance is 1kg per 100kg of the weight of the train. Determine the power of the engine. If the train is to move with uniform acceleration of 2m/s2 on the track after attaining the speed of 62kmph, determine the power of the engine. [7M]



b) Two blocks A and B are connected with an inextensible but flexible string, as shown in figure. Let the system be released from rest. Determine the velocity of the block A after it has moved a distance of 0.8m. Assume that the coefficient of friction between block A and the plane is 0.35. The masses of the blocks are m_A=100kg and m_B=143kg. [7M]



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