Code: 7G321

I B.Tech. II Semester Supplementary Examinations April 2023

Electronic Devices and Circuits

(Common to EEE & ECE)

Max. Marks: 70   Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	BL

UNIT–I

1.		Derive the Stability factors (S, S',) for Voltage Divider Bias Circuit.	14M	1	6
		OR			
2.	a)	Explain the importance of Stability factor in Amplifier circuits.	7M	1	2
	b)	Discuss Heat Sinks with neat sketches.	7M	1	2

UNIT–II

3.	a)	Write the necessary steps for gate bias circuit design and voltage divider bias circuit design.	7M	2	6
	b)	What are the differences between Bipolar Junction Transistor & Field Effect Transistor?	7M	2	1
		OR			
4.	a)	Sketch and Explain the Transfer Characteristics of P – channel JFET.	7M	2	2
	b)	Distinguish between Gate bias & voltage divider bias for basic J-FET.	7M	2	3

UNIT–III

5.		Derive the expressions for input resistance, output resistance and voltage gain of an emitter follower circuit.	14M	3	2
		OR			
6.	a)	What is single stage transistor amplifier and how transistor will amplifies weak signal	7M	3	1
	b)	Explain about the graphical demonstration of transistor amplifier with example	7M	3	2

UNIT–IV

7.	a)	Explain about JFET small signal modeling with necessary expressions.	7M	4	3
	b)	Write a short note on AC Equivalent circuit for JFET.	7M	4	2
		OR			
8.	a)	Draw and explain the notations of AC Equivalent circuit for MOSFETs	7M	4	2
	b)	Briefly explain about Common Source MOSFET Amplifier.	7M	4	1

UNIT–V

9.	a)	Explain the working of Photo Transistor with neat diagram	7M	5	3
	b)	What are the applications of Tunnel diode?	7M	5	2
		OR			
10.	a)	Discuss the principle of operation of UJT.	7M	5	1
	b)	Write a note on LED.	7M	5	2

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I B.Tech. II Semester Supplementary Examinations April 2023
Engineering Mathematics-II
(Common to All Branches)

Max. Marks: 70 Time: 3 Hours
Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)
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Marks

UNIT–I

1. a) Trace the curve $y^2(2a - x) = x^2$. 7M

   b) Evaluate the double integral $\iint_R x\,y\,dx\,dy$ where 'R' is the region bounded by the lines $x-axis$, the line $y = 2x$ and $y = \dfrac{x}{4a}$ 7M

OR

2. a) Trace the curve $r = a(1 - \cos_n)$. 7M

   b) Evaluate the integral by changing the order of integration $\int\limits_0^1 \int\limits_{x^2}^{2-x} xy\,dx\,dy.$ 7M

UNIT–II

3. a) Find the Laplace Transform of sin2t sin3t 7M

   b) Find the Laplace Transform of $t^2 e^{-3t}$. 7M

OR

4. a) Evaluate $\int\limits_0^\infty e^{-2t} \sin^3 t\, dt$ 7M

   b) Find the Laplace Transform of $\cosh^2 2t$ 7M

UNIT–III

5. Find the inverse transform of $\log\left(\dfrac{s+1}{s-1}\right)$. 14M

OR

6. Solve $\dfrac{d^2 x}{dt^2} + 9x = \cos 2t, \quad if\ \ x(0) = 1,\ \ x(f/2) = -1.$ 14M

UNIT–IV

7. a) Show that $div\left(grad\ r^n\right) = n(n+1)r^{n-2}$ 7M

   b) Find the unit vector normal to the surface $x^3 + y^3 + 3x\,y\,z = 3$ at the point $(1, 2, -1)$ 7M

OR

8. Find $div\,\bar{F}$ and $curl\,\bar{F}$ where $\bar{F} = grad\left(x^3 + y^3 + z^3 - 3x\,y\,z\right)$ 14M

UNIT–V

9. Verify divergence theorem for $\bar{F} = 4\,xz\bar{i} - y^2\,\bar{j} + y\,z\,\bar{k}$ taken over the cube bounded by $x=0, x=1; y=0,\ y=1; z=0, z=1$ 14M

OR

10. Evaluate by Green's theorem $\int\limits_c \left[\left(x^2 - \cos hy\right)dx + \left(y + \sin x\right)dy\right]$, where 'c' is the rectangle with vertices $(0,0), (f,0), (f,1), (0,1)$. 14M

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Code: 7GC22

I B.Tech. II Semester Supplementary Examinations April 2023
Engineering Chemistry
(Common to EEE & ECE)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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Marks

UNIT–I

1. a) Explain the process of a phosphate, carbonate and sodium aluminate conditioning of boiler feed water   7M
   b) Give detailed procedure for the determination of dissolved oxygen in water.   7M

OR

2. a) What is break point chlorination? State its significance.   7M
   b) Write brief account on Priming and foaming.   7M

UNIT–II

3. a) Explain the differential aeration corrosion with suitable examples   7M
   b) On dilution Equivalent Conductance of an electrolyte increases whereas Specific Conductance decreases. Explain.   7M

OR

4. a) What is meant by molar Conductance and Equivalent conductance? Write their Units?   7M
   b) Explain the composition, working and applications of Ni-Cd cell   7M

UNIT–III

5. a) What is vulcanization of rubber? Explain why natural rubber needs vulcanization. How is it carried out?   7M
   b) Write a note on the classification of polymers with examples   7M

OR

6. Differentiate Thermoplastic and Thermosetting plastics with suitable examples.   14M

UNIT–IV

7. a) Explain higher calorific value and lower calorific value and distinguish between the HCV & LCV.   7M
   b) Describe how synthetic petrol is synthesized from Bergius process   7M

OR

8. a) Calculate the gross and net calorific value of a coal sample having the following composition carbon-85% hydrogen-8% sulphur-1% hydrogen-2% ash-4% latent heat of steam 587 cal/g   7M
   b) On burning 0.83 g of a solid fuel in bomb calorimeter, the temperature of 3500 g of water increased from 26.5^0 c to 29.2^0 c. Water equivalent of calorimeter and latent heat of steam for 385 grams and 587cal/g respectively. If the fuel contains 0.77% H calculator HCV and NCV.   7M

UNIT–V

9. a) What is cement? How do you classify the cement?   7M
   b) How are lubricants classified? Give examples   7M

OR

10. a) Write a note on the composition of Portland cement   7M
    b) Explain the importance of refractories and their applications.   7M

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Code: 7G523

I B.Tech. II Semester Supplementary Examinations April 2023
Geometrical Drawing
(Common to EEE & ECE)

Max. Marks: 70   Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)
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Marks

UNIT–I		

1. a) Construct a regular Pentagon of given side 35mm. — 7M

   b) Construct an ellipse with major axis 100mm and minor axis 60mm by using Oblong method. — 7M

OR

2. Construct a parabola, when the distance of the focus from the directrix is 50mm. Also draw tangent on normal to the curve at a point 35mm from the directrix. — 14M

UNIT–II

3. A point is 35mm from both the reference planes. Draw its projections in all possible positions — 14M

OR

4. The front view of a 75mm long line measures 55mm. The line is parallel to the H.P and one of its ends is in the V.P and 25mm above the H.P. Draw the projections of the line and determines its inclination with the V.P. — 14M

UNIT–III

5. A square ABCD of 40mm side has a corner on the HP and 20mm in front of the VP. All the sides of the squares are equally inclined to the HP and parallel to the VP. Draw its projections — 14M

OR

6. A regular pentagon of 25mm side has one side on the ground. Its plane is inclined at 45^0 to the HP and perpendicular to the VP. Draw its projections — 14M

UNIT–IV

7. A square ABCD of 40mm side has a corner on the HP and 20mm in front of the VP. All the sides of the squares are equally inclined to the HP and parallel to the VP. Draw its projections — 14M

OR

8. A regular pentagon of 25mm side has one side on the ground. Its plane is inclined at 45^0 to the HP and perpendicular to the VP. Draw its projections — 14M

UNIT–V

9. Convert the following isometric view to orthographic view as shown in Fig
   (i) Front View (ii) Top View (iii) Right Side View

(a)
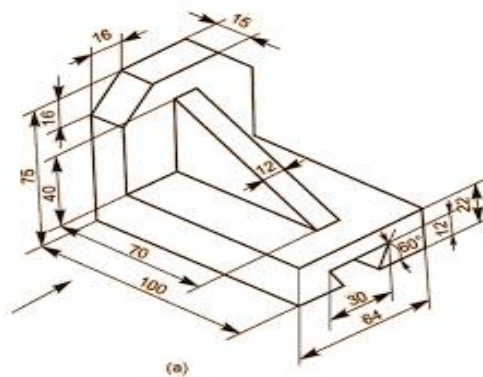
— 14M

OR

10. Draw the isometric view of a hexagonal prism with the side of the base 40mm and length of the axis 70mm, when its axis is vertical. — 14M

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Code: 7G121

I B.Tech. II Semester Supplementary Examinations April 2023

Data Structures

(Common to All Branches)

Max. Marks: 70   Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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Marks

UNIT–I

1. a) What is a pointer? What are the features of pointers? Write a C program to print address of a variable | 7M
   b) Write a C program to swap two numbers using pointers. | 7M

OR

2. a) Using pointers write a C program which finds the maximum among the list of elements. | 7M
   b) Explain in detail about Dynamic Memory allocation with examples | 7M

UNIT–II

3. a) Define union. List out the differences between unions and structures | 7M
   b) Explain different modes to open a file | 7M

OR

4. a) Describe the uses and limitations of getc and putc. | 7M
   b) Write a program for sorting given numbers using selection sort technique | 7M

UNIT–III

5. Write a 'C' program for implementation of various operations on queue. | 14M

OR

6. What is a stack? How it can be represented in "C" using arrays? | 14M

UNIT–IV

7. Represent a doubly linked list using an array. Write routines to insert and delete elements for this representation. | 14M

OR

8. List the operations that can be performed on single linked list. In how many ways a node can be deleted from single linked list? Explain. | 14M

UNIT–V

9. a) Define and describe the terms: Tree, Binary Tree, Complete Binary Tree and Degree of a tree. | 8M
   b) Define the following terms of graphs. i) Undirected graph ii) In degree iii) Digraph | 6M

OR

10. a) Explain the operations on Binary Tree. | 7M
    b) Define graph. Explain About the basic Terminology of graphs. | 7M

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