R-19

Code: 19AC21T

I B.Tech. II Semester Supplementary Examinations February 2022
Differential Equations and Vector Calculus
(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	CO	Blooms Level

UNIT–I

1. a) Solve $(D^2 + 6D + 9)y = e^{-3x}$ — 7M CO1 L3

   b) Solve $(D^2 - 1)y = 3x$ — 7M CO1 L3

OR

2. Solve $\dfrac{d^2 y}{dx^2} - 3\dfrac{dy}{dx} + 2y = xe^{3x} + \sin 2x$ — 14M CO1 L3

UNIT–II

3. Solve $x^2 \dfrac{d^2 y}{dx^2} - x\dfrac{dy}{dx} + y = \log x$. — 14M CO2 L3

OR

4. Solve the simultaneous equations $\dfrac{dx}{dt} + 2y + \sin t = 0, \dfrac{dy}{dt} - 2x - \cos t = 0$ given that $x = 0$ and $y = 0$ when $t = 0$. — 14M CO2 L3

UNIT–III

5. a) Form the partial differential equation by eliminating arbitrary constants a and b from $(x - a)^2 + (y - b)^2 = z^2 \cot^2 \Gamma$ — 7M CO3 L3

   b) Form the partial differential equation by eliminating arbitrary function from $z = f(x^2 + y^2)$ — 7M CO3 L3

OR

6. a) Solve $x(y - z)p + y(z - x)q = z(x - y)$ — 7 M CO3 L3

   b) Solve $p \tan x + q \tan y = \tan z$ — 7 M CO3 L3

UNIT–IV

7. a) Find $div \bar{f}$ where $\bar{f} = grad(x^3 + y^3 + z^3 - 3xyz)$ — 7M CO4 L2

   b) If $\bar{f} = (x + 3y)\bar{i} + (y - 2z)\bar{j} + (x + pz)\bar{k}$ is solenoidal, then find p . — 7M CO4 L2

OR

8. Prove that $r^n \bar{r}$ is solenoidal if $n = -3$. — 14M CO4 L2

UNIT–V

9. Verify Green's theorem in the plane for $\oint (3x^2 - 8y^2)dx + (4y - 6xy)dy$ where C is the region bounded by $y = \sqrt{x}$ and $y = x^2$ — 14M CO5 L3

OR

10. Verify stokes theorem for the function $\bar{F} = x^2\bar{i} + xy\,\bar{j}$ integrated around the square in the plane z=0 whose sides are along the lines x=0,y=0,x=a,y=a. — 14M CO5 L3

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I B.Tech. II Semester Supplementary Examinations February 2022
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	Blooms Level
		UNIT–I			
1.	a)	What is meant by Q- point? What factors to be considered for selecting the Q-point?	7M	1	1
	b)	Define thermal runaway. How it can be avoided?	7M	1	1
		OR			
2.	a)	Explain with the circuit diagram the procedure for analysis of a collector to base bias circuit.	7M	1	2
	b)	Compare different Biasing Circuits with respect to a BJT.	7M	1	5
		UNIT–II			
3.	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
		OR			
4.	a)	Define various FET parameters and Obtain relation among them.	7M	2	1
	b)	With neat sketches, Explain the Construction and Operation of P channel JFET.	7M	2	2
		UNIT–III			
5.	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
		OR			
6.	a)	Define Phase reversal. Explain the phenomenon of Phase reversal of CE amplifier	7M	3	2
	b)	Briefly explain about the practical circuit Transistor amplifier	7M	3	2
		UNIT–IV			
7.	a)	Elaborate the analysis of Common source Amplifier by using JFET with necessary calculations.	7M	4	3
	b)	Discuss the analysis of Source Follower by using JFET with necessary expressions.	7M	4	2
		OR			
8.	a)	If properly biased, FET will act as a voltage controlled voltage source, justify.	7M	4	4
	b)	Write the differences between Common Drain and common source Amplifiers.	7M	4	2
		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)	Write short notes on (i) PIN diode (ii) Photo diode	7M	5	2
	b)	Explain the construction and operation of SCR with neat diagram. Derive expression for anode current.	7M	5	3

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Code: 19AC24T

I B.Tech. II Semester Supplementary Examinations February 2022
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	CO	Blooms Level
		UNIT–I			
1.	a)	How to find the standard electrode potential of zinc.	8M	CO1	L1
	b)	Write a short notes on i) oxidation. ii) reduction iii) electrolytes iv) salt bridge.	6M	CO1	L1
		OR			
2.	a)	Describe the working principle of calomel electrode.	7M	CO1	L3
	b)	Discuss the origin of electrode potential.	7M	CO1	L3
		UNIT–II			
3.	a)	Write any five basic characteristic nature of batteries.	7M	CO2	L1
	b)	List out the various applications of batteries.	7M	CO2	L1
		OR			
4.		Explain the construction and working principle of dry cell.	14M	CO2	L2
		UNIT–III			
5.	a)	Write short notes on the preparation of multi-crystalline and amorphous Silicon.	8M	CO3	L1
	b)	List out the various applications of solar energy.	6M	CO3	L1
		OR			
6.		Give an overview on the manufacturing of photovoltaic cell	14M	CO3	L4
		UNIT–IV			
7.	a)	What are elastomers? explain with examples,	7M	CO4	L1
	b)	List out the uses of thermosetting polymers with examples,	7M	CO4	L1
		OR			
8.	a)	Explain the steps involved in coordination polymerization with specific examples	10M	CO4	L2
	b)	Describe the preparation of Nylon-6,6	4M	CO4	L3
		UNIT–V			
9.	a)	What are nanomaterial? Give examples	8M	CO5	L1
	b)	Write short notes on i) nanoparticles, ii) nanocluster, iii) carbon nanotube (CNT)	6M	CO5	L1
		OR			
10.		Explain the working principle and applications of scanning electron microscope (SEM)	14M	CO5	L2

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R-19

Code: 19A522T

I B.Tech. II Semester Supplementary Examinations February 2022

Programming through Python

(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	Blooms Level
		UNIT–I			
1.	a)	What is computer science? Explain about the Essence of Computational Problem Solving.	7M	CO1	L1
	b)	Write about the process of computational problem solving	7M	CO1	L2
		OR			
2.	a)	Write a python program to find weather a given number is odd or even.	7M	CO1	L3
	b)	Illustrate infinite loop with an example	7M	CO1	L2
		UNIT–II			
3.		Summarize in detail about function routine.	14M	CO2	L2
		OR			
4.	a)	Compare lists and tuples in Python	7M	CO2	L3
	b)	Describe the typical operations performed on lists	7M	CO2	L3
		UNIT–III			
5.	a)	Explain the use of modular design in software development	7M	CO3	L2
	b)	Explain the process of top-down design	7M	CO3	L2
		OR			
6.	a)	Distinguish different ways of using import statement	7M	CO3	L3
	b)	Differentiate between a text file and a binary file	7M	CO3	L3
		UNIT–IV			
7.	a)	Explain the concept of an object	7M	CO4	L2
	b)	Describe the use of object references	7M	CO4	L2
		OR			
8.	a)	Justify the need of automatic garbage collection in python	7M	CO4	L5
	b)	Summarize the concept of memory allocation and deallocation.	7M	CO4	L5
		UNIT–V			
9.	a)	Define data structures and list out various types of data structures	7M	CO5	L2
	b)	Discuss about the common operations performed on data structures	7M	CO5	L2
		OR			
10.		Examine abstract data type with its types along with the syntax used	14M	CO5	L3

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