R-19

Code: 19A421T

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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Code: 19AC24T

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	CO	BL

UNIT–I

| 1. | a) | What is glass electrode? How it is used to find pH of the solution? | 7M | 1 | 1 |
| | b) | What are the different types of electrodes or half cells? | 7M | 1 | 1 |

OR

| 2. | a) | How to find the standard electrode potential of zinc. | 8M | 1 | 1 |
| | b) | Write a short notes on i) oxidation. ii) reduction iii) electrolytes iv) salt bridge. | 6M | 1 | 1 |

UNIT–II

| 3. | a) | Illustrate the working principle of Li- MnO_2 batteries | 7M | 2 | 4 |
| | b) | Discuss the classification of batteries. | 7M | 2 | 4 |

OR

| 4. | a) | Define reserve battery with example. | 5M | 2 | 1 |
| | b) | Write any five basic characteristic nature of batteries. | 9M | 2 | 1 |

UNIT–III

| 5. | | Explain the manufacturing of single crystalline silicon. | 14M | 3 | 3 |

OR

| 6. | a) | Write short notes on the preparation of multi-crystalline and amorphous Silicon. | 8M | 3 | 1 |
| | b) | List out the various applications of solar energy. | 6M | 3 | 1 |

UNIT–IV

| 7. | a) | Explain the preparation and p-n doping of polyaniline | 10M | 4 | 2 |
| | b) | Discuss the difference between Bun-N rubber and Buna-S rubber. | 4M | 4 | 3 |

OR

| 8. | a) | Write the preparation and properties of bakelite. | 7M | 4 | 1 |
| | b) | What is mean by functionality? Explain with suitable examples. | 7M | 4 | 1 |

UNIT–V

| 9. | a) | What are nanomaterial? Give examples | 8M | 5 | 1 |
| | b) | Write short notes on i) nanoparticles, ii) nanocluster, iii) carbon nanotube (CNT) | 6M | 5 | 1 |

OR

| 10. | | Explain the working principle and applications of scanning electron microscope (SEM) | 14M | 5 | 2 |

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I B.Tech. II Semester Supplementary Examinations April 2023
Programming through Python
(Common to EEE and 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. | Discuss in detail about the following | | | |
| | a) Input error checking   b) multi-way selection | 14M | CO1 | L4 |

OR

| 2. a) | List out arithmetic operators in python and illustrate them with examples | 7M | CO1 | L2 |
| b) | Describe and illustrate Boolean operators with examples. | 7M | CO1 | L2 |

UNIT–II

| 3. | Justify the use of list comprehensions in Python. | 14M | CO2 | L5 |

OR

| 4. a) | Summarize in detail about function routine. | 14M | CO2 | L2 |
| b) | Compare lists and tuples in Python | 7M | CO2 | L3 |

UNIT–III

| 5. | Explain the process of exception handling in detail. | 14M | CO3 | L3 |

OR

| 6. a) | Explain the use of modular design in software development | 7M | CO3 | L2 |
| b) | Write a python program to write some text into a file. | 7M | CO3 | L2 |

UNIT–IV

| 7. | Determine three fundamental features of object oriented programming | 14M | CO4 | L3 |

OR

| 8. a) | Justify the need of automatic garbage collection in python | 7M | CO4 | L5 |
| b) | Summarize the concept of memory allocation and de allocation. | 7M | CO4 | L5 |

UNIT–V

| 9. | Write an algorithm for Single Linked List-traversing and explain it with an example. | 14M | CO5 | L5 |

OR

| 10. 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 |

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Code: 19AC21T

I B.Tech. II Semester Supplementary Examinations April 2023
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	BL

UNIT–I

1. a) Solve $(D^2 + 5D + 6)y = e^x$ — 7M — CO1 — L3

   b) Solve $(D^2 + 4)y = \cos x$ — 7M — CO1 — L3

OR

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

UNIT–II

3. Solve $(2x-1)^2 \dfrac{d^2 y}{dx^2} + (2x-1)\dfrac{dy}{dx} - 2y = 8x^2 - 2x + 3$ — 14M — CO2 — L3

OR

4. Solve $x^2 \dfrac{d^2 y}{dx^2} - 4x\dfrac{dy}{dx} + 6y = x^2$ — 14M — CO2 — L3

UNIT–III

5. Solve $x^2(y-z)p + y^2(z-x)q = z^2(x-y)$ — 14M — CO3 — L3

OR

6. a) Form the partial differential equations by eliminating arbitrary functions from
   $z = f(x + at) + g(x - at)$ — 7M — CO3 — L3

   b) Solve $pyz + qzx = xy$ — 7M — CO3 — L3

UNIT–IV

7. a) Find $grad\ f$ where $f = x^3 + y^3 + 3xyz$ — 7M — CO4 — L2

   b) Find the directional derivative of $w = x^2 - 2y^2 + 4z^2$ at (1,1,-1) in the direction of $2\bar{i} + \bar{j} - \bar{k}$. — 7M — CO4 — L2

OR

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

UNIT–V

9. Using Green's theorem evaluate $\oint_C (2xy - x^2)dx + (x^2 + y^2)dy$, where C is the

   closed curve of the region bounded by $y = x^2\ and\ y^2 = x$. — 14M — CO5 — L3

OR

10. Verify stokes theorem for the function $\overline{F} = x^2\bar{i} + xy\ \bar{j}$ 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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