

Hall Ticket Number :										
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R-19

Code: 19A421T

I B.Tech. II Semester Supplementary Examinations December 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)

UNIT-I

- | | Marks | CO | BL |
|---|-------|----|----|
| 1. Explain DC and AC load line analysis of a transistor with neat sketches. | 14M | 1 | 2 |
- OR**

- | | | | |
|---|----|---|---|
| 2. a) Compare different Biasing Circuits with respect to a BJT. | 7M | 1 | 5 |
| b) What is meant by Q- point? What factors to be considered for selecting the Q- point? | 7M | 1 | 1 |

UNIT-II

- | | | | |
|--|----|---|---|
| 3. a) Explain different FET Biasing methods. Also explain their merits and demerits. | 7M | 2 | 2 |
| b) Distinguish between Enhancement mode and Depletion mode MOSFETs. | 7M | 2 | 3 |

OR

- | | | | |
|--|----|---|---|
| 4. a) Write short notes on MOSFET Biasing Circuits. | 7M | 2 | 6 |
| b) The P-channel FET has a $I_{DSS} = -12\text{mA}$, $V_p = 5\text{V}$, $V_{gs} = 5.32\text{V}$ calculate I_D , g_m and g_{mo} . | 7M | 2 | 3 |

UNIT-III

- | | | | |
|---|----|---|---|
| 5. a) Explain the steps to be followed for drawing DC and AC equivalent circuits for transistor amplifier and sketch them | 7M | 3 | 2 |
| b) Write a short note on DC and AC load lines | 7M | 3 | 6 |

OR

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|---|----|---|---|
| 6. a) With the help a graphical demonstration, illustrate how a transistor can be used as an amplifier. | 7M | 3 | 2 |
| b) List out the characteristics of CE, CB and CC amplifiers | 7M | 3 | 1 |

UNIT-IV

- | | | | |
|--|-----|---|---|
| 7. Draw the small-signal model of common drain FET amplifier. Derive expressions for voltage gain and output resistance? | 14M | 4 | 3 |
|--|-----|---|---|

OR

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|---|----|---|---|
| 8. a) With neat diagrams, explain single stage amplifier with waveforms. | 7M | 4 | 3 |
| b) The gain of a certain FET amplifier with a source resistance of zero is 25. Determine the value of drain resistance, if the trans Conductance is $5500\mu\text{s}$. | 7M | 4 | 4 |

UNIT-V

- | | | | |
|---|----|---|---|
| 9. a) With a neat sketch, explain the characteristics of SCR. | 7M | 5 | 3 |
| b) Discuss about the Photo Diode with neat symbol. | 7M | 5 | 2 |

OR

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|--|----|---|---|
| 10. a) Write a note on LED. | 7M | 5 | 1 |
| b) Discuss in detail about Schottky Barrier Diode. | 7M | 5 | 3 |

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R-19

Code: 19AC24T

I B.Tech. II Semester Supplementary Examinations December 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)

UNIT-I

- | | Marks | CO | Blooms Level |
|--|-------|----|--------------|
| 1. a) Explain the working principles of electrolytic cell. | 8M | 1 | 2 |
| b) Explain the measurement of electrode potentials for copper. | 6M | 1 | 2 |

OR

- | | | | |
|---|----|---|---|
| 2. a) Illustrate the working principle of concentration cells | 7M | 1 | 4 |
| b) Derive Nernst equation. | 7M | 1 | 4 |

UNIT-II

- | | | | |
|---|----|---|---|
| 3. a) Differentiate the Primary and secondary batteries | 7M | 2 | 4 |
| b) Classify the fuel cells based on their electrolytes | 7M | 2 | 4 |

OR

- | | | | |
|---|----|---|---|
| 4. a) Write short notes on i) electrode ii) electrolyte iii) salt bridge. | 6M | 2 | 1 |
| b) What are the basic constituents of batteries | 8M | 2 | 1 |

UNIT-III

- | | | | |
|--|----|---|---|
| 5. a) What are the advantages of CVD method? | 8M | 3 | 1 |
| b) List out the steps involved in czochralski Process and float-zone process | 6M | 3 | 1 |

OR

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|--|-----|---|---|
| 6. Explain the production of solar grade silicon from Quartz | 14M | 3 | 2 |
|--|-----|---|---|

UNIT-IV

- | | | | |
|---|-----|---|---|
| 7. a) Illustrate the conducting mechanism of poly-acetylene | 10M | 4 | 4 |
| b) Discuss the difference between Thermoplastics and Thermosettings | 4M | 4 | 4 |

OR

- | | | | |
|---|----|---|---|
| 8. a) List out the uses of thermosetting polymers with examples, | 6M | 4 | 1 |
| b) Write the preparation, properties and uses of urea-formaldehyde resin. | 8M | 4 | 1 |

UNIT-V

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|---|----|---|---|
| 9. a) Describe the linear prototype motion of an autonomous light-powered molecular motor with example. | 7M | 5 | 3 |
| b) Discuss the molecular motion of molecular elevator | 7M | 5 | 2 |

OR

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|--|-----|---|---|
| 10. Illustrate the chemical synthesis of nanomaterials by using sol-gel method | 14M | 5 | 4 |
|--|-----|---|---|

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R-19

Code: 19A521T / 19A522T

I B.Tech. II Semester Supplementary Examinations December 2022

Python Programming / Programming through Python

(Common to CE, ME & CSE) (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)

		Marks	CO	BL
UNIT-I				
1. a)	Write a python program to find weather a given number is odd or even.	7M	CO1	L3
b)	Who invented python? Write what you know about python programming.	7M	CO1	L2
OR				
2.	Write about operator precedence in detail	14M	CO1	L4
UNIT-II				
3.	Define set and illustrate set in Python with suitable example	14M	CO2	L2
OR				
4.	Write a python program for temperature conversion using functions	14M	CO2	L4
UNIT-III				
5.	Write a python program to count the number of vowels in a string provided by the user.	14M	CO3	L3
OR				
6. a)	Explain the process of top-down design	7M	CO3	L2
b)	Differentiate between a text file and a binary file	7M	CO3	L3
UNIT-IV				
7. a)	Define class and explain it with suitable example	7M	CO4	L2
b)	Explain the concept of an object	7M	CO4	L2
OR				
8.	Write in detail about special methods in python	14M	CO4	L3
UNIT-V				
9.	Define queue. Illustrate queue operations with the examples.	14M	CO5	L3
OR				
10.	Draw and explain the operations on stack using linked list.	14M	CO5	L3

Code: 19AC21T

I B.Tech. II Semester Supplementary Examinations December 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)

UNIT-I

1. Solve $(D^2 + 3D + 2)y = e^{-x} + x^2 + \cos x$ Marks CO BL
14M CO1 L3
OR

2. Solve $\frac{d^2 y}{dx^2} + 4y = \sec 2x$ by using method of variation of parameters. 14M CO1 L3

UNIT-II

3. An uncharged condenser of capacity C is charged by applying an e.m.f $E \sin\left(\frac{t}{\sqrt{LC}}\right)$, through leads of self-inductance L and negligible resistance, prove that for any time t, the charge on one the plate is $\frac{EC}{2} \left[\sin\left(\frac{t}{\sqrt{LC}}\right) - \frac{t}{\sqrt{LC}} \cos\left(\frac{t}{\sqrt{LC}}\right) \right]$. 14M CO2 L3
OR

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

UNIT-III

5. Solve $(p^2 + q^2)y = qz$ by using Charpits method. 14M CO3 L3
OR
6. Form the partial differential equation by eliminating arbitrary constants a and b from $(x-a)^2 + (y-b)^2 = z^2 \cot^2 r$ 14M CO3 L3
Form the partial differential equation by eliminating arbitrary function from $z = f(x^2 + y^2)$ 14M CO3 L3

UNIT-IV

7. Find the work done by a force $\vec{F} = (x^2 - y^2 + x)\vec{i} - (2xy + y)\vec{j}$ which moves a particle in xy- plane from (0,0) to (1,1) along the parabola $y^2 = x$. 14M CO4 L2
OR
8. Show that the vector $(x^2 - yz)\vec{i} + (y^2 - zx)\vec{j} + (z^2 - xy)\vec{k}$ is irrotational and find its scalar potential. 14M CO4 L2

UNIT-V

9. Verify Green's theorem in the plane for $\int (xy + y^2)dx + x^2 dy$ where C is the region bounded by $y = x$ and $y = x^2$ 14M CO5 L3
OR
10. Use Divergence theorem to evaluate $\iint (x\vec{i} + y\vec{j} + z\vec{k}) \cdot \vec{n} \cdot ds$, where s is the surface bounded by the cone $x^2 + y^2 = z^2$ in the plane $z = 4$. 14M CO5 L3
