

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

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|---|----|---|---|
| 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 | | | |
| 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 | | | |
| 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

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

Hall Ticket Number :

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

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

UNIT-II

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

OR

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|---|----|---|---|
| 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

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|--|----|---|---|
| 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

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

OR

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|---|----|---|---|
| 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)

UNIT-I

- | | Marks | CO | BL |
|---|-------|-----|----|
| 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

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|--|-----|-----|----|
| 2. Write about operator precedence in detail | 14M | CO1 | L4 |
|--|-----|-----|----|

UNIT-II

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|--|-----|-----|----|
| 3. Define set and illustrate set in Python with suitable example | 14M | CO2 | L2 |
|--|-----|-----|----|

OR

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|--|-----|-----|----|
| 4. Write a python program for temperature conversion using functions | 14M | CO2 | L4 |
|--|-----|-----|----|

UNIT-III

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|---|-----|-----|----|
| 5. Write a python program to count the number of vowels in a string provided by the user. | 14M | CO3 | L3 |
|---|-----|-----|----|

OR

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|--|----|-----|----|
| 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

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|---|----|-----|----|
| 7. a) Define class and explain it with suitable example | 7M | CO4 | L2 |
| b) Explain the concept of an object | 7M | CO4 | L2 |

OR

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|--|-----|-----|----|
| 8. Write in detail about special methods in python | 14M | CO4 | L3 |
|--|-----|-----|----|

UNIT-V

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|---|-----|-----|----|
| 9. Define queue. Illustrate queue operations with the examples. | 14M | CO5 | L3 |
|---|-----|-----|----|

OR

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|---|-----|-----|----|
| 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 $\int_C (xy + y^2)dx + x^2 dy$ where C is the region bounded by $y = x$ and $y = x^2$ 14M CO5 L3
OR
10. Use Divergence theorem to evaluate $\iint_S (x\vec{i} + y\vec{j} + z\vec{k}) \cdot \vec{n} \cdot ds$, where S is the surface bounded by the cone $x^2 + y^2 = z^2$ in the plane $z = 4$. 14M CO5 L3
