

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations February-2024

APPLIED PHYSICS

(Common to CSE, CAD, CCC, CSM, CIC, CIT & CAI)

Time: 3 Hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

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|---|---|---|-----|----|----|
| 1 | a | Discuss the theory of interference of light due to thin films by reflection with suitable ray diagram. | CO1 | L1 | 6M |
| | b | Derive the condition for bright and dark rings interference in the case of thin films by reflected light. | CO1 | L4 | 6M |

OR

- | | | | | | |
|---|---|---|-----|----|----|
| 2 | a | In the study of Fraunhofer diffraction due to single slit how the diffraction fringes are formed. | CO1 | L4 | 8M |
| | b | Obtain conditions for bright and dark fringes in single slit diffraction pattern and draw intensity distribution. | CO1 | L2 | 4M |

UNIT-II

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|---|---|--|-----|----|----|
| 3 | a | Derive an expression for electrical conductivity in a metal by using classical free electron theory. | CO2 | L4 | 6M |
| | b | What are the postulates, merits and drawbacks of classical free electron theory? | CO2 | L1 | 6M |

OR

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|---|--|---|-----|----|-----|
| 4 | | Derive the Maxwell's equations in differential and integral form. | CO2 | L4 | 12M |
|---|--|---|-----|----|-----|

UNIT-III

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|---|---|---|-----|----|----|
| 5 | a | Describe the construction and working principle of He-Ne Laser with the help of a neat diagram. | CO3 | L2 | 8M |
| | b | What are the advantages of He-Ne laser | CO3 | L1 | 4M |

OR

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|---|---|---|-----|----|----|
| 6 | a | Describe optical fiber communication system with block diagram. | CO3 | L2 | 8M |
| | b | Mention the application of optical fiber in sensors | CO3 | L1 | 4M |

UNIT-IV

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|---|---|---|-----|----|----|
| 7 | a | Derive the expression for Hall coefficient in semiconductors. | CO4 | L4 | 8M |
| | b | What are the applications of Hall Effect | CO4 | L1 | 4M |

OR

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|---|---|---|-----|----|----|
| 8 | a | Explain the formation of p-type semiconductors with band diagram . | CO4 | L2 | 8M |
| | b | Mobilities of electrons and holes in an intrinsic germanium at 300K are $0.36 \text{ m}^2/\text{Vs}$ and $0.17 \text{ m}^2/\text{Vs}$ respectively. If the resistivity is $2.12 \Omega \text{ m}$. Calculate the intrinsic concentration ? | CO4 | L4 | 4M |

UNIT-V

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|---|---|--|-----|----|----|
| 9 | a | Explain BCS theory of superconductors. | CO5 | L2 | 8M |
| | b | What is Meissner effect? Explain how Superconductors are behaving like a Diamagnetic material. | CO5 | L1 | 4M |

OR

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|----|---|--|-----|----|----|
| 10 | a | Explain why surface area to volume ratio very large for nano materials. | CO5 | L2 | 6M |
| | b | What are the mechanical, magnetic and optical properties of nanomaterials. | CO5 | L1 | 6M |

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