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

B.Tech I Year II Semester Regular & Supplementary Examinations October-2022

APPLIED PHYSICS

(Common to EEE & ECE)

Time: 3 hours

Max. Marks: 60

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

UNIT-I

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|---|---|--|----|----|
| 1 | a | Describe the formation of Newton's ring with necessary theory with relevant diagram and derive the expressions for dark and bright fringes. | L3 | 9M |
| | b | In a Newton's rings experiment, the diameter of the 5 th ring is 0.30 cm and the diameter of the 15 th ring is 0.62 cm. Calculate the diameter of the 25 th ring. | L4 | 3M |

OR

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|---|---|---|-------|----|
| 2 | a | Define diffraction. Distinguish between Fraunhofer and Fresnel's diffraction. | L1&L4 | 6M |
| | b | Distinguish between Interference and Diffraction. | L4 | 6M |

UNIT-II

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|---|---|--|----|----|
| 3 | a | What are the salient features of classical free electron theory? | L4 | 4M |
| | b | Derive an expression for electrical conductivity in a metal. | L4 | 8M |

OR

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|---|---|---|----|----|
| 4 | a | Write a significance of divergence of a vector. | L1 | 4M |
| | b | State and Explain Gauss's theorem for divergence. | L4 | 8M |

UNIT-III

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|---|---|---|----|----|
| 5 | a | Describe the important characteristic of laser beam. | L3 | 4M |
| | b | Describe the construction and working principle of He-Ne Laser with the help of a neat diagram. | L3 | 8M |

OR

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|---|---|--|----|----|
| 6 | a | What is acceptance angle of an optical fiber and derive an expression for it. | L1 | 8M |
| | b | An optical fibre has a core refractive index of 1.44 and cladding refractive index of 1.40. Find its numerical aperture and θ_a . | L1 | 4M |

UNIT-IV

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|---|---|--|----|----|
| 7 | a | What is Fermi level? Prove that the Fermi level lies exactly in between conduction band and valance band of intrinsic semiconductor. | L4 | 8M |
| | b | Draw the energy band structure of intrinsic semiconductor. | L3 | 4M |

OR

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|---|---|---|----|----|
| 8 | a | Describe the Hall Effect in semiconductors. | L3 | 8M |
| | b | Write the applications of Hall Effect. | L1 | 4M |

UNIT-V

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|---|---|---|----|----|
| 9 | a | What is Meissner effect? | L1 | 4M |
| | b | Explain the Type-I and Type-II superconductors. | L4 | 8M |

OR

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|----|---|---|----|----|
| 10 | a | What are the techniques available for synthesizing nanomaterials? | L1 | 4M |
| | b | Explain ball milling technique for synthesis of nanomaterial. | L4 | 8M |

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