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NAME OF FACULTY: ROSHNI PAWAR SUBJECT: ENGINEERING PHYSICS CODE : BT-201				

Unit-I

(Wave nature of particles and the Schrodinger equation)

Q.1 Explain the term Phase and particle velocity in context with De Broglie's hypothesis. Prove that for a relativistic and non-relativistic particle, phase velocity is not equal to particle velocity.

Q.2 Explain operators.

Q.3 State and prove Heisenberg uncertainty Principle.

Q.4 Obtain the expression of energy levels and wave function for a particle trapped in one dimensional square with infinitely deep potential well and also derive the formula for Eigen function?

Unit-II

(Wave Optics)

Q.1 Explain Huygens' Principle?

Q.2 Describe and explain the formation of Newton's rings in reflected monochromatic light. Explain why Newton's rings are circular? How wavelength of given monochromatic light is calculated?

Q.3 what is diffraction grating? How it is used to find the wavelength of light?

Q.4 Explain Rayleigh criterion of resolving power of optical instrument. Derive the Expression for resolving power of grating.

Q.5 Explain superposition of waves?

Unit-III

(Introduction to solids)

Q.1 Explain Fermi level of Intrinsic and extrinsic?

Q.2 what is Hall effect? Show that Hall coefficient is independent of the applied magnetic field and is inversely proportional to current density and electronic charge.

Q.3 Explain constructional working, with the help of I – V characteristics of Zener diode or tunnel diode.

Q.4 Explain Bloch's theorem for particles in a periodic potential?

Q.5 Describe Kronig-Penney model?

Unit-IV
(Laser and Fiber Optics)

Q.1 What is spontaneous and stimulated emission? Explain Einstein's coefficient and derive relationship between them.

Q.2 Discuss working and construction of Ruby or CO₂ Laser with the help of necessary diagram.

Q.3 Discuss construction and working of He-Ne laser.

Q.3 What are optical Fiber? Explain how glass fiber guides light from one end to other. Define acceptance angle and numerical aperture.

Q.4 Differentiate the step index and graded index optical fiber.

Q.5 Write a short note on different mechanism in optical fiber.

Unit-V
(Electrostatics in vacuum)

Q.1 Calculation of electric field?

Q.2 Explain Electric displacement?

Q.3 Explain Basic Introduction to Dielectrics?

Q.4 Explain Maxwell's equation in vacuum?

Q.5 What Gauss Theorem?