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Combined First and Second Semester B.Tech. Degree Examination, April 2015 (2008 Scheme) 08-102: ENGINEERING PHYSICS (CMNPHETARUFBS)

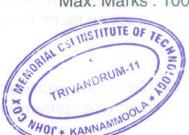
Time: 3 Hours

Max. Marks: 100

PART-A

Answer all questions. Each question carries 4 marks.





- 2. Explain the concept of displacement current using Maxwell's fourth equation.
- 3. What are nanomaterials? List the important applications of nanomaterials.
- White light falls normally on a film of soapy water whose thickness is 5×10⁻⁵ cm.
 Refractive index = 1.33. Which wavelength in the visible region will be reflected most strongly.
- 5. What is meant by resolving power of an optical instrument? Explain briefly Rayleigh's criterion for resolution.
- 6. Explain the phenomenon of double refraction.
- 7. Briefly explain the term simultaneity in relativity.
- 8. Explain the concept of wavefunction. Represent the probability distribution of a particle in a one dimensional box.
- Discuss Fermi Dirac system at absolute zero and arrive the expression for Fermi energy.
- 10. Distinguish between spontaneous emission and stimulated emission.



PART-B

Answer any two questions from each Module. Each question carries 10 marks.

Module - I

- 11. Establish the differential equation of a forced harmonic oscillator and obtain its solution. Explain amplitude resonance.
- 12. Show that Electric fields and magnetic fields in an electromagnetic wave are at right angles to each either.
- 13. Define Co-ordination number and packing factor for crystal lattice and obtain the packing factor for various cubic structures.

Module - II

- 14. Derive the expression for the wavelength of a monochromatic light using Newton's ring arrangement with necessary theory.
- 15. a) Distinguish between Fresnel and Fraunhofer diffraction.
 - b) Describe and explain Fraunhofer diffraction at a single slit.
- 16. Explain the construction and working of a Nicol Prism. List some uses of polaroid.

Module - III

- Derive Schrodinger time dependent equation and then deduce time independent wave equation.
- What are the postulates of Base-Einstein statistics? Derive Planck's radiation formula. Assuming black body radiation as an ideal boson gas.
- 19. Explain the construction and working of Ruby Laser.