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Reg. No. : .....

Name : .....

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.

1. Distinguish between a plane wave and a spherical wave.
2. Explain the concept of displacement current using Maxwell's fourth equation.
3. What are nanomaterials ? List the important applications of nanomaterials.
4. 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.
9. Discuss Fermi – Dirac system at absolute zero and arrive the expression for Fermi energy.
10. Distinguish between spontaneous emission and stimulated emission.

P.T.O.

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

17. Derive Schrodinger time dependent equation and then deduce time independent wave equation.

18. 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.
