Code No: NR10103 **NR**

I B.Tech Supplementary Examinations, November/December 2005
ENGINEERING PHYSICS
(Common to Civil Engineering,Mechanical Engineering,Chemical Engineering,Mechatronics,Metallurgy & Material Technology,Production Engineering and Aeronautical Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Define spatial and temporal coherence.
   (b) Derive an expression for the width of fringes obtained in the case of air wedge.
   (c) Show that the radii of Newton's rings are in the ratio of the square roots of natural numbers. [4+6+6]
2. (a) What do you understand by diffraction of light? Distinguish clearly between interference and diffraction of light.
   (b) Discuss the Fraunhofer diffraction at a single slit. [6+10]
3. (a) What are Quarter and half wave plates?
   (b) Describe how circularly and elliptically polarized lights are produced.
   (c) Calculate the thickness of a Quarter wave plate for light of wave length 6000A.V. ($\mu_o = 1.554$, $\mu_e = 1.544$) [5+8+3]
4. (a) Describe the construction of a typical optical fiber.
   (b) Define NA and obtain its expression for an optical fiber.
   (c) Describe the light wave communication process using optical fibers. [3+5+8]
5. (a) Explain loss tangent or dielectric loss in dielectrics.
   (b) Write a note on polarization in dielectrics. [10+6]
6. (a) Write a short note on Type-I and Type-II super conductors.
   (b) Discuss the BCS theory of super conductivity. [8+8]
7. (a) Write a short note on soft and hard magnetic materials.
   (b) Discuss the mechanism of creep. [8+8]
8. Answer the following
   (a) Grating spectrum
   (b) Characteristics of laser light.
   (c) Ruby laser
   (d) Applications of ultrasonics. [3+3+6+4]

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