**C 14943**

(Pages 2)

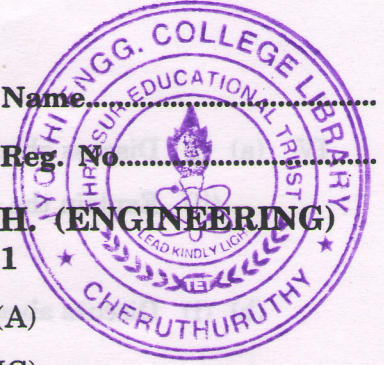Name......................................

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# COMBINED FIRST AND SECOND SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, MAY 2011

EN 2K 103 A—ENGINEERING PHYSICS (A)

(Common for AI, CS, EE, EC, IT, PT and IC)

Time : Three Hours                                                                      Maximum : 100 Marks

I.  (a) Derive the equation for plane parallel thin film and give the correction for phase change at reflection.

   (b) A plane polarised light is incident perpendicularly on a quartz plate cut with faces parallel to optic axis. Find the thickness of quartz plate, which introduces phase difference of 60° between $e^-$ and $O^-$ rays.

   (c) Explain degenerate and non-degenerate states.

   (d) Give some applications of Ultrasonics.

   (e) Write a short note on Holography.

   (f) What are Q-Switching and mode locking ?

   (g) Explain Type I and Type II superconductors.

   (h) Explain about LED with neat diagram.

                                                                                           (8 × 5 = 40 marks)

II.  (a) (i) Explain the experimental method of Lawren's Half shade Polari meter with neat diagram.
                                                                                           (8 marks)

        (ii) Explain the interfernece pattern in Air wedge.                              (7 marks)

                                        *Or*

     (b) (i) Explain the Newton rings formation in the wave optics.                      (8 marks)

        (ii) Explain the prinicples quarter wave plates.                                 (7 marks)

III. (a) (i) Explain the experimental methods of NMR and ESR spectrum.                   (8 marks)

        (ii) Explain the applications of NMR and ESR applications.                       (7 marks)

                                        *Or*

     (b) (i) Explain the prinicples of Piezo Effect.                                     (8 marks)

        (ii) Using Schrödinger equation get the equation for Particle in a Box.          (7 marks)

**Turn over**

IV.  (a)  (i)  Discuss about different types of Optical Fibers.                          (8 marks)

         (ii)  Explain the application of Lasers in industries.                          (7 marks)

*Or*

     (b)  (i)  Discuss about wave propagation in asymmetric waveguides with TE and TM modes.
                                                                                         (8 marks)

         (ii)  Explain the light wave communications using optical fibres and its advantages.
                                                                                         (7 marks)

V.  (a)  (i)  Describe about the Fermi level and Fermi energy in semiconductor.          (8 marks)

         (ii)  Explain Phototransistor.                                                  (7 marks)

*Or*

     (b)  (i)  State and explain BCS theory.                                             (8 marks)

         (ii)  Give the importance of Hall effect.                                       (7 marks)

[4 × 15 = 60 marks]