

C 5802

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Name: .....

Reg. No. ....

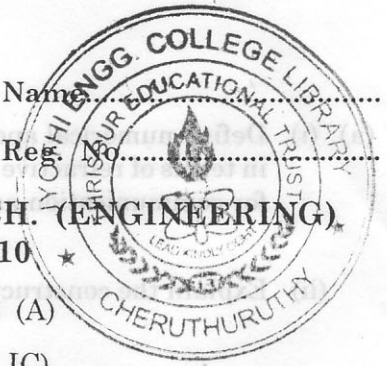
COMBINED FIRST AND SECOND SEMESTER B.TECH. (ENGINEERING)  
DEGREE EXAMINATION, JUNE 2010

EN 2K 103 (A)—ENGINEERING PHYSICS (A)

(Common to AI, CS, EE, EC, IT, PT AND IC)

Time : Three Hours

Maximum : 100 Marks



Answer all questions.

- I. (a) Explain the principle of Nickel Prism.  
(b) Differentiate Fresnel and Fraunhofer diffraction.  
(c) Differentiate NMR and ESR.  
(d) Give the application of ultrasonics.  
(e) Explain with neat diagram about the optical pumping concept in Laser.  
(f) Explain the advantages optical fibres in communications.  
(g) Write the working principle of solar cell.  
(h) Explain BCS theory. (8 × 5 = 40 marks)
- II. (a) (i) Give the theory of plane, circular and elliptical polarized light in wave optics. (10 marks)  
(ii) Explain the theory of Double refraction. (5 marks)
- Or
- (b) (i) Give the theory and experiments of air wedge. (10 marks)  
(ii) Give theory of plane transmission grating. (5 marks)
- III. (a) (i) What are ultrasonic waves ? Explain with neat circuit, the generation of ultrasonic waves using piezoelectric oscillator. (8 marks)  
(ii) Using quantum mechanics derive the second order Schrödinger equation for time independent condition. (7 marks)
- Or
- (b) (i) Explain in detail about the experimental methods of NMR and ESR spectrum. (10 marks)  
(ii) Applications of NMR and ESR. (5 marks)

Turn over

- IV. (a) (i) Define numerical aperture and derive expression for NA and angle of acceptance of fiber in terms of refractive index of the core and fiber. Mention some advantages of optical fiber for communication as a wave guide. (8 marks)
- (ii) Explain the construction of working Nd-YAG laser with a neat diagram. (7 marks)

Or

- (b) (i) Classify different types of lasers based on the active medium with one example for each. (10 marks)
- (ii) Explain the basic principles of holography. (5 marks)
- V. (a) (i) Give the theory of Hall effect. (5 marks)
- (ii) Derive the measurements of Hall voltage and Hall coefficient from Hall effect set up. (10 marks)

Or

- (b) (i) Give the basic properties of super conductors. (10 marks)
- (ii) State and explain Josephson effect. (5 marks)

[4 × 15 = 60 marks]