

C 40921

(Pages 2)

Name.....

Reg. No.....

**COMBINED FIRST AND SECOND SEMESTER B.TECH. (ENGINEERING)
DEGREE EXAMINATION, APRIL 2013**

EN/PTEN 09 103—ENGINEERING PHYSICS

(2009 Scheme—Regular/Supplementary/Improvement)

Time : Three Hours

Maximum : 70 Marks

Part A

Answer all questions.

1. What is the difference between the optical and geometrical paths ?
2. Explain Reciprocal lattice.
3. What is the physical meaning of numerical aperture ?
4. Explain Avalanche breakdown.
5. What is Stationary state ?

(5 × 2 = 10 marks)

Part B

Answer any four questions.

6. Explain the formation of Newton's ring and show that the radius for the n^{th} dark ring is proportional to the under root of wavelength.
7. Prove the reciprocal lattice of BCC is FCC.
8. The volume of the hall is 475 cm^3 . Suppose the wall has an area of 200 m^2 and it contains two open windows, each having an area of 25 m^2 . The area of floor and ceiling of the hall is 100 m^2 each. If the absorption coefficient of the wall, ceiling and floor are 0.025, 0.02 and 0.55 respectively, calculate the reverberation time for the hall.
9. Electrons are accelerated through 300 V and are reflected from a crystal. If the first order reflection maximum occurs at a glancing angle of 60 degrees, calculate the inter-planar distance ?
10. Derive the expression for numerical aperture of step index fiber. Show that it does not depend on the physical dimension of the fiber ?
11. Explain how the Fermi level changes with the increasing amount of impurity in n -type and p -type semiconductor.

(4 × 5 = 20 marks)

Turn over

Part C

Answer section (a) or section (b) of each question.

12. (a) Explain why thin film observed in sunlight exhibit colors. What does an excursive thin film of uniform thickness seen by reflected light shown no color but appears dark ? Deduce the condition.

Or

- (b) Explain the Bravais lattice of three dimensional crystal systems.

13. (a) Explain the principle and working of He-Ne laser with energy level diagram.

Or

- (b) Explain the basic structure of optical fiber with suitable diagrams. Distinguish between step index fiber and graded index fiber.

14. (a) What is Meissner effect ? Explain the properties of Type I and Type II super conductors with suitable diagrams and examples.

Or

- (b) Explain characteristics of a NPN transistor in CE configuration.

15. (a) Derive the eigen functions and eigen values of particle in a box problem.

Or

- (b) Explain the principle and working of acoustic grating with diagram.

(4 × 10 = 40 marks)