

17/05/14 (N) FN

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(Pages : 2)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2014

First and Second Semesters

EN 010 102—ENGINEERING PHYSICS

(New Scheme—2010 Admission onwards—Regular/Improvement/Supplementary)

[Common for all branches]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. Enlist the applications of lasers in medicine.
2. What is meant by Silsbee effect ?
3. Define atomic packing factor. What is its unit ?
4. Classify shape memory alloys.
5. Define piezoelectric effect. Draw a diagram to show piezoelectric axes of quartz.

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. Explain the principle of laser and hence explain the importance of metastable state.
7. What is meant by ac Josephson effect ? Derive the expression for ac supercurrent through a Josephson junction.
8. Prove the relationship between the edge of the unit cell and the atomic radius for the *bcc* and *fcc* lattices.
9. Give the details of Rayleigh scattering.
10. Write a short note on liquid crystals and their applications.

(5 × 5 = 25 marks)

Turn over

Part C

Answer all questions.

Each question carries 12 marks.

11. Describe the construction and working of ruby laser. What are its (i) merits ; (ii) demerits ; (iii) any two important applications.

(9 + 1 + 1 + 1 = 12 marks)

Or

12. Explain (a) the principle of holography ; (b) Method of recording a hologram ; (c) Reconstruction of image from a hologram ; (iv) Why a laser beam only can be used for recoding and reconstructing hologram ?

(1 + 5 + 4 + 3 = 12 marks)

13. (a) Explain the stability of nanoclusters in relation with magic number.

- (b) Discuss the electric and magnetic properties of nanomaterials.

(6 + 6 = 12 marks)

Or

14. (a) Explain isotope effect and flux quantization.

- (b) Give a comparative treatment between type I and type II superconductors.

(6 + 6 = 12 marks)

15. Give the details of crystal systems and related Bravais lattices.

Or

16. Discuss the structural, electrical, magnetic and chemical properties of metallic glasses.

17. Explain the principle, construction and working and merits and demerits of magnetostriction ultrasound generator.

Or

18. What is meant by Raman effect ? Explain the details of experimental study of Raman effect.

(2 + 10 = 12 marks)

19. (a) Define acceptance angle and Numerical Aperture.

- (b) Derive an expression for N.A.

- (c) What are the differences between Step Index multimode fibres and GRIN fibres.

(3 + 5 + 4 = 12 marks)

Or

20. Explain the working of any three optical fibre sensors with suitable block diagrams.

[5 × 12 = 60 marks]