

G 6802

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Reg. No. 10021005.....

Name A.lem.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

First and Second Semesters

EN 010-102 – ENGINEERING PHYSICS

(Common for all branches)

[2010 Admissions – Regular]

Time : Three Hours

Maximum : 100 Marks

Part A

All questions are compulsory.

Each question carries 3 marks.

1. What are the characteristics of laser?
2. What is the significance of the term surface to volume ratio in nanoscience and technology?
3. Distinguish between Primitive cell and Unit cell.
4. What are the merits and demerits of Magneto-Striction method of ultra sound generation?
5. Define Shape memory effect. Mention any *three* properties of shape memory alloys.

(5 × 3 = 15 marks)

Part B

All questions are compulsory.

Each question carries 5 marks.

6. Give explanation about fundamental components of any laser. Using a schematic diagram, show how they are suitably connected together.
7. State and explain Meissner effect. Show that perfect diamagnetism is the deciding property of super conductors.
8. Derive an expression for the separation between lattice planes in a cubic crystal.
9. Describe a method of Non-Destructive Testing using ultrasonic waves.
10. Explain the quantum theory of Raman effect.

(5 × 5 = 25 marks)

Turn over

Part C

Each question carries 12 marks.

11. Describe the construction and working of a He-Ne laser. Discuss its merits and demerits.

(10 + 2 = 12 marks)

Or

12. Explain the principle of holography. Differentiate it from ordinary and photography. Describe the method of recording a hologram. What are the applications of holography.

(2 + 2 + 6 + 2 = 12 marks)

13. Explain the physical properties of carbon nano tubes. Explain the formulation of fullness of C_{60} .

(6 + 6 = 12 marks)

Or

14. Give the details of d.c. and a.c. Josephson effects. Give one of the applications of Josephson junction.

(8 + 4 = 12 marks)

15. Deduce Bragg's law of X-ray diffraction. Explain how NaCl crystal structure can be studied by X-ray diffraction method.

(6 + 6 = 12 marks)

Or

16. Give a detailed account on metallic glass, their method of production, types, properties and applications.

(12 marks)

17. Discuss the properties and applications of ultrasonics.

(12 marks)

Or

18. Discuss the factors affecting the acoustics of buildings. Suggest remedies.

(12 marks)

19. Explain the working principle of Optical fibres. What is meant by attenuation in an optical fibre? Derive an expression for attenuation.

(12 marks)

Or

20. Draw a labelled block diagram of an optical fibre communication system and explain the role of every component.

How many reflections will be made by a light ray entering a 2 m long optical fibre cable. If the angle of incidence with the axis of the core is 3.43° . Given that the core diameter and refractive index are $60 \mu\text{m}$ and 1.48 respectively.

(7 + 5 = 12 marks)

[5 × 12 = 60 marks]