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Question Paper Code : 95379

5 Year M.Sc. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

First Semester

Software Engineering

XCS 113/10677 SW 103 — APPLIED PHYSICS

(Common to 5 Year M.Sc. Information Technology and M.Sc. Computer Technology)

(Regulation 2003/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Give the relation between three moduli.
2. Define co-efficient of viscosity.
3. Show that an intensity level of 1 dB corresponds to an intensity change by 26%.
4. Mention the adverse effects of noise pollution on human beings.
5. Define thermal conductivity of a material.
6. State the first and second laws of thermodynamics.
7. The top of a tower has an angle of elevation of 45° with respect to the horizontal as measured by the Sextant from a point. After moving 25 m towards the tower, the angle of elevation is found to increase by 10° . Hence find the height of the tower.
8. Give the working principle of SEM.
9. Distinguish between spontaneous and stimulated emission.
10. What is a sensor?

PART B — (5 × 16 = 80 marks)

11. (a) Discuss the theory of a cantilever and hence use it to obtain the depression of non-uniform bending of beams. Also explain why girders are made in I-shape. (12 + 4)

Or

- (b) Explain the principle and working of
- (i) Diffusion pump, and,
 - (ii) Pirani gauge. (8 + 8)
12. (a) (i) Draw a typical stress-strain diagram of a wire subjected to increasing tension. Explain the various regions in it. (8)
- (ii) Derive an expression for the elevation of the midpoint of a beam supported symmetrically on two knife edges and loaded equally at the ends. Assume the expression for the bending moments. (8)

Or

- (b) (i) Describe Ostwald viscometer with a neat diagram. Explain how it is used to compare the viscosities of two liquids. (8)
- (ii) Describe a Penning gauge with a neat diagram and explain the principle of its working. What are the advantages of this gauge? (8)
13. (a) Explain determination of thermal conductivity of a given material using Forbe's method. Give the necessary theory.

Or

- (b) Deduce an expression for the efficiency of Otto engine.
14. (a) Describe the construction of Michelson's interferometer and explain any of its application in a detailed manner. (12 + 4)

Or

- (b) (i) Explain the principle, construction and action of Sextant. (6)
- (ii) Explain the construction and working of scanning electron microscope. (10)
15. (a) (i) Describe the construction and working of semi conductor laser. (10)
- (ii) Write an essay on fiber optic sensors. (6)

Or

- (b) (i) With a neat diagram, discuss the construction and working of CO₂ Laser. (10)
- (ii) Discuss the different types of fibers along with the diagram for refractive index profile and light ray propagation. (6)