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Question Paper Code : 95291

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

First Semester

Software Engineering

ESE 011 — APPLIED PHYSICS

(Common to 5 Year M.Sc. Software Systems)

(Regulations 2010)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Mention the factors affecting elasticity of the material.

2. Define critical velocity of a fluid.

3. If the reverberation time is lower than the critical values, how will it affect the acoustical quality of à building?

4. Mention the properties of ultrasonic waves.

5. Define thermal conductivity of a material.

6. Define entropy.

7. Define photo elasticity.

8. What is photometry?

9. What is the role of helium atom in helium-neon laser?

10. Give any two applications of optical fibres.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Determine the rigidity modulus of a wire and the moment of inertia of a circular disc about the axis of its suspension. (10)

(ii) Give an account of I shaped griders. (6)

Or

(b) (i) Describe the method to determine the young's modulus of the rectangular beam by bending it uniformly. (8)

(ii) Describe the Oswald viscometer and explain how it can be used to compare the viscosities of two liquids. (8)

12. (a) Explain the factors affecting architectural acoustics and their remedies. (16)

Or

(b) What are magnetostriction and piezoelectric effects? Write down the complete experimental procedure, with a neat diagram of producing Ultrasonic waves by magnetostriction effect. (6 + 10)

13. (a) (i) Give the detailed theory and the experimental procedure involved in the Forbe's method for determination of thermal conductivity of a metal. (10)

(ii) Calculate the work done in a carnot's cycle of operations. Deduce the efficiency of a carnot's engine in terms of the temperatures between which it works. (6)

Or

(b) (i) Describe the cylindrical shell method to determine the thermal conductivity of bad conductors. Derive the formula for thermal conductivity of a rubber tube, and explain the experimental procedure involved. (12)

(ii) Explain the entropy of a substance. Show that entropy remains constant in a reversible process but increases in an irreversible one. (4)

14. (a) (i) Explain the working of a Lummer-Brodhum photometer with a neat diagram. (12)

(ii) Obtain an expression for the thickness of anti-reflection coating on a surface. (4)

Or

(b) With a neat diagram of a Michelson interferometer, explain its working and discuss the nature of different fringe patterns formed. (16)

15. (a) (i) Establish the relation between Einstein's coefficient. (6)

(ii) Describe the construction and working of CO_2 laser. (10)

Or

(b) Explain the propagation of light through optical fiber and the applications of optical fiber as a waveguide and sensor. (16)
