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Question Paper Code : 65241

M.Sc. (5 Year) DEGREE EXAMINATION, MAY/JUNE 2013.

First Semester

Software Engineering

ESE 011 – APPLIED PHYSICS

(Regulation 2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. The level of stress at which strain ceases to be wholly elastic is known as elastic limit. Justify your answer.
2. What are I shape grids?
3. If the reverberation time is lower than the critical values, how will it affect the acoustical quality of a building?
4. Mention the properties of ultrasonic waves.
5. Define the term thermal conductivity.
6. Write about the working of a Carnot engine as a refrigerator.
7. Mention the applications of Michelson's interferometer.
8. What are antireflection coatings?
9. Atleast how many energy levels are minimum required for the production of laser by a medium? Justify your answer.
10. What is fiber optic sensor?

PART B — (5 × 16 = 80 marks)

11. (a) Describe in detail how a torsion pendulum is helpful in determining the rigidity modulus of a wire and the moment of inertia of the disc. (16)
- Or
- (b) What is Reynold's number? Give its expression. Deduce Poiseuille's formula for the flow of the liquid through a capillary tube. Also determine the coefficient of viscosity of a liquid. (3+8+5)

12. (a) Write in detail about 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) Obtain an expression for the quantity of heat conducted radially out of a hollow cylinder. Using this, explain how the thermal conductivity of rubber can be determined. (16)

Or

- (b) State the laws of thermodynamics and carnot's theorem. Show that the area of the temperature entropy diagram of a carnot cycle is the useful work done the engine in one cycle. (8+8)
14. (a) Explain the principle used in antireflection coating. Determine the condition for destructive interference involving the refractive indices of glass film and air. With theory explain how thickness of a thin wire can be determined by forming air- wedge? (16)

Or

- (b) Describe the construction and working of
- (i) Sextant and
- (ii) Scanning electron Microscope. (8+8)
15. (a) Explain the basic principle used in lasers. Explain with a neat diagram the working of a semiconductor laser and discuss its merits and demerits over other lasers.s (4+9+3)

Or

- (b) Derive an expression for Numerical aperture and angle of acceptance of a fiber interms of refractive indices of the core and cladding. What are different types of fiber optical sensors? Explain the working of pressure sensor. (7+2+7)