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Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 45263

5 Years M.Sc. DEGREE EXAMINATION, JANUARY 2015.

First Semester

Software Engineering

ESE 011 — APPLIED PHYSICS

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

(Regulation 2010)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the effect of temperature on elasticity of a material?
2. Define viscosity of a fluid.
3. Define sound absorption coefficient of a surface.
4. List any four medical applications of ultrasonics.
5. When a glass plate and a metal plate are heated at their centres separately, the glass plate breaks suddenly, while metal plate does not. Why?
6. State the first and second laws of thermodynamics.
7. What is anti-reflection coating? Mention any one use of it.
8. Mention the Uses of photoelasticity
9. What are the properties of laser?
10. A step index fiber is not suitable for multimode propagation. Why?

PART B — (5 × 16 = 80 marks)

11. (a) Derive an expression for the depression of a cantilever. Hence, use it to find the depression of non uniform bending of a beam.

Or

(b) (i) Discuss the principle and working of a diffusion pump with a neat diagram. (8)

(ii) Explain the use of Ostwald viscometer to compare viscosities. (8)

12. (a) Define reverberation time. Derive Sabine's formula of it.

Or

(b) (i) What is called magnetostriction effect? Explain the magnetostriction method of producing ultrasonic waves. (12)

(ii) Outline the use of ultrasonic waves in welding and drilling in industries. (4)

13. (a) (i) Discuss the theory and experimental procedure to determine the thermal conductivity of a bad conductor by Lee's disc method. (12)

(ii) Explain the method of providing thermal Insulation in buildings. (4)

Or

(b) (i) Discuss the various strokes of an Otto engine, and derive an expression for its efficiency. (12)

(ii) Explain the use of Carnot's cycle for refrigeration (4)

14. (a) (i) Discuss the theory and experimental procedure of air wedge to find the thickness of a thin wire. (12)

(ii) Using air wedge, outline the method of testing flatness of surfaces. (4)

Or

(b) (i) Discuss the theory and working of Michelson's interferometer and explain the different types of fringes formed. (12)

(ii) Mention the applications of electron microscope. (4)

15. (a) (i) Explain the working of Nd:YAG laser device with energy level scheme. (12)

(ii) He-Ne laser is more monochromatic than CO_2 laser. Why? (4)

Or

(b) (i) Discuss the propagation of light through an optical fiber and deduce expressions for the numerical aperture and maximum acceptance angle of the fiber. (12)

(ii) Outline the use of optical fiber as temperature sensor. (4)

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