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Question Paper Code : 27379

5 Year M.Sc. DEGREE EXAMINATION, MAY/JUNE 2016

First Semester

Computer Technology

XCS 113/10677 SW 103 – APPLIED PHYSICS

(Common to M.Sc. – Software Engineering and M.Sc. – Information Technology)

(Regulations 2003/2010)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. What is the effect of impurities on the elasticity of a material ?
2. List the methods of producing high vacuum.
3. What are ultrasonics ?
4. A music hall has a volume of 7500 m^3 . The total absorption in the hall is 800 O.W.U. Estimate reverberation time of that hall.
5. State the second law of thermodynamics.
6. Define Entropy.
7. Distinguish between luminous intensity and intensity of illumination.
8. Give the principle used in photo-elastic stress analysis.
9. Calculate the band gap of a laser diode emitting light with wavelength $1.55 \mu\text{m}$.
10. A silica optical fiber has a core refractive index of 1.50 and a cladding refractive index of 1.47. Determine critical angle and numerical aperture of the fiber.

PART – B (5 × 16 = 80 Marks)

11. (a) (i) Define thermal conductivity. Describe Lee's method of determining the thermal conductivity of a bad conductor. (8)
- (ii) What are the requirements of thermal insulating materials ? Give a few examples for this type of materials. (4)
- (iii) A copper rod has cross sectional area 0.785×10^{-4} sq. m. and length 19×10^{-4} m. One of its ends is at 100 C and the other end is at 30 C. Calculate the thermal conductivity of copper if heat of 3.3×10^3 Joules is conducted through the rod in 5 minutes. (4)

OR

- (b) Describe the construction and working of penning gauge and Oswald viscometer. (8 + 8)

12. (a) (i) Define reverberation time and derive Sabine's formula for reverberation time. (8)
- (ii) What is Piezo-electric effect ? Explain with neat circuit, the generation of ultrasonic using a Piezo-electric oscillator. (8)

OR

- (b) (i) Discuss in detail about the factors affecting the acoustics of Building. (8)
- (ii) Explain in detail any four applications of ultrasonic waves. (8)

14. (a) (i) Discuss the theory of air-wedge and obtain an expression for the fringe-width. (12)
- (ii) Outline the applications of Michelson's interferometer. (4)

OR

- (b) With neat diagrams, explain the principle and working of (i) sextant, and (ii) metallurgical microscope. (8 + 8)

15. (a) (i) Describe the construction and working of Nd-YAG laser. (10)
- (ii) Give the applications of laser. (8)

OR

- (b) (i) Discuss the different types optical fibers. (8)
- (ii) List any four applications of optical fibre. (8)