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Question Paper Code : X21071

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020

First Semester

Civil Engineering

PH 6151 – ENGINEERING PHYSICS – I

(Common to All Branches)

(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. What is a primitive cell ?
2. Name few techniques of crystal growth from melt.
3. How does change in temperature affect the elastic property of a material ?
4. State Newton's law of cooling.
5. State Compton effect.
6. What is the basic principle in transmission electron microscope ?
7. An auditorium has a plastered walls with sound absorption co-efficient of 0.10 O.W.U. The speech inside the auditorium is not clear due to too much of reverberation. It has been proposed to improve the acoustics of the hall. Two different materials with sound absorption co-efficient of 0.050 O.W.U. and 0.150 O.W.U. are available. Which material you will choose ? Give reason.
8. Mention the techniques applied to determine the defects within a material through NDT.
9. Define numerical aperture.
10. Show that the stimulated emission is not possible for Sodium D line at 300°C.



PART – B

(5×16=80 Marks)

11. a) What are Miller indices ? Derive an expression for the interplanar spacing (hkl) planes of a cubic structure. (16)
(OR)
- b) Explain the following structures :
i) Diamond (10)
ii) Graphite (6)
12. a) i) Derive an expression for depression at the free end of cantilever due to load. (12)
ii) Give an account of I-shape Girders. (4)
(OR)
- b) Describe with theory Lee's disc method of determination of thermal conductivity of a bad conductor. (16)
13. a) Explain Compton effect and derive an expression for the wavelength of scattered photon, also briefly explain its experimental verification. (16)
(OR)
- b) Derive in time dependent Schrödinger wave equation and hence deduce the time independent Schrödinger wave equation. (8+8)
14. a) Derive an expression for growth and decay of sound energy inside a hall and represent them graphically. Find an expression for Reverberation time. (16)
(OR)
- b) i) Describe the construction and working principle of piezo-electric oscillator of producing ultrasonic waves. (10)
ii) Briefly explain the principle of sonogram. (6)
15. a) Describe with necessary energy level diagram, the construction and working of Nd-YAG laser. Mention any two applications of Nd-VAG laser. (12+4)
(OR)
- b) i) Derive expressions for numerical aperture and acceptance angle of an optical fibre. (12)
ii) Discuss the classification of optical fibre based on the materials. (4)
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