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

Question Paper Code: 51103

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2016

First Semester

Civil Engineering

15UPH103 - ENGINEERING PHYSICS

(Common to ALL branches)

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The unit of thermal conductivity is

   (a) $Wm^{-2} K^{-2}$ (b) $Wm^{-1} K$ (c) $Wm K^{-2}$ (d) $Wm^{-1} K^{-1}$

2. Poisson's ratio values ranging is _____

   (a) - 0.5 to 0.5 (b) -0.5 to 0 (c) 0 to 1 (d) 0 to 0.5

3. The units of loudness are _____

   (a) 10 *dB* (b) phon and sone (c) 40 *dB* (d) decibel and phon

4. _____ materials are used in magnetostriction generator

   (a) Ferromagnetic (b) Antiferromagnetic
   (c) Diamagnetic (d) Paramagnetic

5. Nicol prism is used to _____

   (a) Produce polarized light (b) analyze polarized light
   (c) both a and b (d) none of these

6. It is used to populate CO_2 atoms to the upper level.

(a) Role of Nitrogen (b) Role of Helium
(c) Role of CO_2 (d) Mixure of N_2 and He

7. Calculate the equivalent wavelength of electron moving with a velocity of

(a) $\lambda = \frac{h}{mv}$ (b) $\lambda = mv$ (c) $\lambda = \frac{hc}{E}$ (d) $\lambda = \frac{h}{\sqrt{2mE}}$

8. Compton wavelength is

(a) h/mv (b) h/mc (c) λ/mv (d) λ/mc

9. The number of coordination number for HCP structure is

(a) 6 (b) 8 (c) 12 (d) 4

10. What is the coordination number for Simple cubic structure?

(a) 8 (b) 6 (c) 12 (d) 4

PART - B (5 x 2 = 10 Marks)

11. Define Poisson's ratio.

12. State Newton's law of cooling.

13. Define Decibel.

14. An electron is accelerated by a potential difference of 140 *V*. What is the wavelength of the electron?

15. What are all the parameters of unit cell?

PART - C (5 x 16 = 80 Marks)

16. (a) What is meant by a cantilever? Derive an expression for the bending moment of a beam. (16)

Or

(b) (i) Derive an expression for Young's modulus of uniform bending. (10)

(ii) Explain stress-strain diagram. (6)

17. (a) Derive an expression for reverberation time and explain how it can be used to determine the absorption coefficient of a material. (16)

Or

(b) (i) Explain how ultrasonic waves can be produced by using Magnetostriction method. (10)

(ii) Describe the method of determining the velocity of ultrasonic waves using acoustic grating. (6)

18. (a) (i) What is mean by Interference, refractive index, Birefrigence? (6)

(ii) Show that plane polarized and circularly polarized lights are special cases of ellipitically polarizes light. (10)

Or

(b) Discuss with theory, the construction and working of Homojunction and Heterojunction Semiconductor laser. (16)

19. (a) (i) Explain the de Broglie wavelength concept of wave nature. (4)

(ii) Derive Schrodinger time independent wave equations. (12)

Or

(b) (i) Explain the quantum theory of Compton effect. (12)

(ii) Describe the experimental verification of Compton effect. (4)

20. (a) (i) Show that the atomic packing density of FCC and HCP structures are equal. (10)

(ii) Describe the seven types of crystal systems. (6)

Or

(b) (i) Determine the atomic radius and packing factor of BCC structure of crystal growth. (10)

(ii) Explain with neat sketch the Bridgman method. (6)

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