Register Number: ……………………..

B.E DEGREE EXAMINATIONS:MAY/JUNE2014

(Regulation 2007)

First Semester

MECHANICAL ENGINEERING

U07PH101: Physics - I

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1.   Ultrasonic waves are
     a) Highly energetic   b) Low energetic
     c) Travel smaller distance   d) Electromagnetic

2.   The primitives a, b, c of an unit cell and the Interfacial angles α , β and г are called as
     a) Miller indices   b) Lattice Parameters
     c) Crystallo graphic axes   d) Amorphous

3.   In A mode scan method of NDT which of the technique used
     a) Brightness modulation   b) Analog modulation
     c) Amplitude modulation   d) Avalanche modulation

4.   The value of (c/a) ratio in Hexagonal Close Packed structure is
     a) 1.63   b) 2.63
     c) 3.63   d) 1

5.   Which is not an application of Air wedge?
     a) Testing the flatness of the surface   b) Measuring the thickness of the paper
     c) Measuring the radius of the thin wire   d) Standardization of a meter

6.   Uniaxial crystals are:
     a) Calcite   b) Tourmaline
     c) Quartz   d) All the above

7.   De-Broglie wave corresponding to a particle of mass m and velocity v has awavelength associated with it
     a) h/mv   b) h mv
     c) mh/v   d) m/hv

8.   Emission of electrons from a metal surface whrn illuminated by light of suitable wave length is called
     a) Compton effect   b) Photo electric effect

     c) Ferro electric effect   d) Piezo electric effect

9.   The use of Nitrogen in Carbon dioxide laser is
     a) Excite carbon dioxide molecules b) Remove the heat
     c) Stablise carbon dioxide molecules d) Scatter carbon dioxide molecules

10. The light gathering capacity of an optical fibre is measured by
     a) Total internal reflection   b) Numerical Aperture
     c) Fractional index change   d) Critical angle

PART B (10 x 2 = 20 Marks)

11. What is meant by acoustics of the building?

12. What is Magnetostriction effect?

13. What are miller indices?

14. Give the principle of Thermography.

15. What is half wave plate?

16. What is the principle of Michelson's Interferometer?

17. What are de-Broglie matter waves?

18. What are degenerate and nondegenerate energy levels?

19. What are the Characteristics of laser?

20. Define Numerical Aperture of a fibre.

PART C (5 x 14 = 70 Marks)

21. a)   Derive Sabine's formula for reverberation time.

(OR)

     b)   What is Piezo electric effect? Explain the principle, construction and working of Piezoelectric oscillator in producing Ultrasonic waves.

22. a)   Mention the atomic radius , coordination number and derive the expression for packing density of HCP structure. Show that the c/a ratio is 1.633.

(OR)

     b)   Explain the X-ray radiography and Fluoroscopy method of NDT.

23. a) Discuss the theory of Air Wedge and explain how the thickness of thin transparent sheet is to be measured using the same.

(OR)

b) Explain in detail the production and detection of plane, circularly and elliptically polarized light.

24. a) What is Compton effect? Derive an expression for the frequency of the scattered photon in terms of the frequency of incident radiation and scattering angle.

(OR)

b) Derive the Schrodinger's time independent equation and also obtain the time dependent equation for a moving particle.

25. a) (i) Explain the construction and working of Carbon dioxide laser. (10)

(ii) Explain the construction of Hologram. (4)

(OR)

b) (i) State the principle and propagation of light in Optical Fibre. (7)

(ii) Explain the different types of Optical Fibre. (7)

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