Code No. 262 / E

FACULTY OF SCIENCE

B.Sc. II-Semester (CBCS) Examination, May / June 2017

Subject : Physics

Paper – II : Waves and Oscillations

Time : 3 Hours **Max. Marks: 80**

PART – A (5 x 4 = 20 Marks)

(Short Answer Type)

Note : Answer any FIVE of the following questions.

1 Write the characteristics of simple Harmonic motion.

2 A body of 0.5 kg mass is hanged to a spring and made to oscillate. For time t = 0, displacement is 0.44m, acceleration is 0.0176m/s^2. Find the force constant of the spring.

3 Define the term "Resonance" and explain its four applications.

4 A body of 100 gm is hanged to a loaded spring. It is stretched 5cm downwardly and released. If the Resistance of the medium is 100 Dyne / cm, Calculate the time taken for reduction of amplitude by 1 cm, when it begins to oscillate.

5 Write the laws of vibrations of strings and explain them.

6 A string of linear density 0.1 kg/m and tension 10 N is fixed at one end. Calculate the power required to make oscillate the other end with an amplitude of 0.1 m and with 10 Hz frequency.

7 How does acoustic wave propagate in a bar fixed at one end?

8 The velocity of sound in steel is 5050 m/s. If the density of steel is 700 kg /m^3, then determine Youngs modulus of steel.

PART – B (4 x 15 = 60 Marks)

(Essay Answer Type)

Note: Attempt ALL the questions.

9 (a) Write the advantages of using a compound pendulum over a simple pendulum and obtain the equation for the length of the compound pendulum.

OR

(b) Two simple harmonic motions in simple ratio acts in mutually perpendicular directions are recombined. Discuss the resultant motion.

10 (a) Explain that the energy of a damped oscillator decreases with time. Show that the energy dissipation increases with increase of damping factor.

OR

(b) Define "Relaxation damped harmonic oscillator and obtain the relation between the relaxation time and the damping factor.

11 (a) Obtain a general solution differential equation of wave passing through a medium.

OR

(b) Explain the modes of vibration of a stretched string clamped at both the ends.

12 (a) Obtain the equation for the longitudinal wave passing in a bar fixed at both the ends and solve it.

OR

(b) Obtain the equation to a transverse wave passing in a bar whose both the ends are free and solve it.

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