

S.Y.B.SC. SEM – IV (2014 COURSE) : WINTER - 2017

SUBJECT : PHYSICS: WAVES AND OSCILLATIONS (P-41)

Day : Thursday
Date : 26/10/2017

Time : 03.00 PM TO 05.00 PM
Max. Marks: 40.

W-2017-0628

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the **RIGHT** indicate full marks.
- 3) Draw neat labeled diagrams **WHEREVER** necessary.

Q.1 Attempt any **TWO** of the following: (10)

- a) The phase difference between two S.H.Ms perpendicular to each other and having frequencies in the ratio 2:1 is zero. Discuss the nature of the resultant motion?
- b) Obtain expression for average power absorbed during the forced oscillations
- c) What is velocity resonance? Obtain the condition for velocity resonance.

Q.2 Attempt any **TWO** of the following: (10)

- a) An A. C. voltage of peak value 300 volts and frequency 50Hz is applied to a series LCR circuit containing a 40 mH inductor, 150 ohm resistor and 20 μ F capacitor. Calculate impedance of the circuit.
- b) Write a note on seismic waves.
- c) Describe one method used for production of ultrasonic waves

Q.3 Attempt any **TWO** of the following: (10)

- a) Explain optical method for obtaining lissajous figures.
- b) Write a note on log decrement and quality factor
- c) An object of mass 0.2 kg is hung from a spring whose force constant is 80 N/m. If it is subjected to a damping constant of 4 Ns/m, set up the differential equation for damped oscillations of the system and find the period of such oscillations.

Q.4 Attempt any **FIVE** of the following: (10)

- a) What is the period of oscillation of mass of 40 kg on a spring with constant $k= 10\text{N/m}$?
- b) What is meant by over damped motion and critically damped motion?
- c) What is forced oscillation? Give two examples.
- d) Define energy density of the wave and intensity of the wave.
- e) State any two applications of ultrasonic waves
- f) The velocity of transverse waves over stretched string is 200 cm/s. If its mass per unit length is 5 gm/cm. Find tension in the string.
- g) State any two application of Doppler effect

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