Roll No. ⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚   Total No. of Pages : 02

Total No. of Questions : 07

B.Sc.(CS) (2013 & Onwards)   (Sem.–2)
THEORY OF WAVES & OSCILLATIONS
Subject Code : BCS-204
M.Code : 71509

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTION TO CANDIDATES :
1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains SIX questions carrying TEN marks each and a student has to attempt any FOUR questions.**

SECTION-A

1. **Answer briefly :**

    (a) Differentiate between simple harmonic motion and oscillatory motion.

    (b) What is a compound pendulum?

    (c) Define logarithmic decrement.

    (d) Define quality factor for a damped oscillator.

    (e) What is the effect of damping on natural frequency of an oscillator?

    (f) When is the power supplied to an oscillator by the driving force maximum?

    (g) Is the energy stored in a forced oscillator?

    (h) What are transverse and longitudinal waves?

    (i) Two electric transmission cables are joined at a point. What special acre should be taken for proper transmission of power?

    (j) What do you mean by standing waves?

SECTION-B

2. Derive a general differential equation of motion of a simple harmonic oscillator and obtain its various solutions.

3. Calculate the resultant of two simple harmonic motions at right angles when their periods are in the ratio 2 : 1.

4. Establish the differential equation of motion for a damped harmonic oscillator and obtain an expression for displacement. Discuss the case of heavy damping.

5. Derive an expression for the Q-value of a forced oscillator in terms of resonance band width.

6. Derive the relation for the characteristic impedance of a string. Explain the factors on which it depends.

7. Show that all energy arriving at the boundary in the incident wave leaves the boundary in the reflected and transmitted wave. Define reflection and transmission coefficients of energy. Show that the sum of the reflection and transmission coefficients of energy is always in unity.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.