43 (6) 6·6

2019

BUILDING SERVICES–IV

Paper : ARC-6·6

(Acoustic)

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer ***all*** *questions.*

1. *(a)* Write a short note an Sound Energy. Show the following with proper diagram which is derived from "Pure Tone Wave form" (i.e. by tuning fork) 10

   (i) High tone

   (ii) Low tone

   (iii) Amplitude

   (iv) Periodic time '*T*'

(v) Compressions

(vi) Rarefaction

(vii) Frequency 'f' $\left(f = \frac{1}{T}\right)$

(viii) Wavelength 'λ'

(ix) Velocity 'v' $(v = \lambda \times f)$

(b) Define : (1) Wavelength (λ) (2) Frequency (f) (3) Hertz (Hz) (4) Velocity (v) and (5) Amplitude. 10

2. Write short notes on the following : ***(answer any five)*** 5×5=25

(a) Live room and dead room

(b) Reverberation

(c) Threshold intensity of sound

(d) Porosity

(e) Decibel scale

(f) Sound Level Meter.

3. Explain all the acoustical defects and state the remedial methods to overcome the defects. 20

4. Fill up the gaps with proper words : 5×1=5

(i) In _____ P.E. Sabine came up with automatic recording of reverberation time.

(ii) 'f' is the number of cycles of vibration per _____ called Hertz (Hz).

(iii) Sensitivity of hearing depends upon the sound _____, pressure, power and also the frequency range of the _____.

(iv) The reflected sound and direct sound must reach the listener within _____ *millisec.* for proper sound reinforcement.

5. Describe with proper diagram, how the sound is distributed in a room from a single source of sound. 10

6. What is the effect of Mass Law in a partition wall ? 10

7. Answer Yes ***or*** No: 5×1=5

(a) For every vibration of the sound source, the wave moves forward by several wavelengths.

(b) Sound energy impinging on the eardrum causes it to be stable.

(c) A sound produced at one end of a long metal tube is heard thrice at the other end in an interval of 2 *sec.*

(d) Sound reflectors are used for sending sound energy at longer places in desired direction.

(e) Fabric seats (not leather) with perforated seat pans provide stable R.T. when auditorium is partially occupied.

8. Answer ***any one***: 5

(a) What is the impact of Mass Law in the case of partition walls?

(b) What is Crosstalk? What are the measures to avoid it?