

250 Waves Multiple Choice Questions

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Q1. What type of wave requires a medium for propagation?

- A) Electromagnetic wave
- B) Sound wave
- C) Light wave
- D) X-ray

Correct Answer: B

Explanation: Sound needs a material medium; it cannot travel through vacuum.

Q2. Which of the following is a longitudinal wave?

- A) Light wave
- B) Water wave
- C) Sound wave in air
- D) Radio wave

Correct Answer: C

Explanation: In a longitudinal wave, particles oscillate parallel to direction of propagation, as in sound.

Q3. Which quantity is the reciprocal of frequency?

- A) Wavelength
- B) Amplitude
- C) Period
- D) Velocity

Correct Answer: C

Explanation: Period $T = 1/f$.

Q4. The SI unit of frequency is:

- A) Joule
- B) Hertz
- C) Newton
- D) Watt

Correct Answer: B

Explanation: 1 Hertz = 1 cycle per second.

Q5. Which factor determines the loudness of sound?

- A) Frequency
- B) Wavelength
- C) Amplitude
- D) Velocity

Correct Answer: C

Explanation: Loudness increases with the square of amplitude.

Q6. Which type of wave is produced on the surface of water?

- A) Longitudinal
- B) Transverse
- C) Both longitudinal and transverse
- D) Electromagnetic

Correct Answer: C

Explanation: Water waves have both longitudinal and transverse components.

Q7. In a transverse wave, the particles of the medium move:

- A) Parallel to wave direction
- B) Perpendicular to wave direction

- C) Opposite to wave direction
- D) Randomly

Correct Answer: B

Explanation: Transverse motion is perpendicular to propagation.

Q8. What is the speed of a wave given by?

- A) $f \times \lambda$
- B) λ / f
- C) f / λ
- D) $1 / (\lambda f)$

Correct Answer: A

Explanation: Wave speed $v = \text{frequency} \times \text{wavelength}$.

Q9. The phenomenon of bending of waves around an obstacle is called:

- A) Reflection
- B) Refraction
- C) Diffraction
- D) Interference

Correct Answer: C

Explanation: Diffraction is bending of waves through openings or around edges.

Q10. The time required for one complete vibration is called:

- A) Amplitude
- B) Frequency
- C) Wavelength
- D) Time period

Correct Answer: D

Explanation: Time period T is time for one cycle.

Q11. What determines the pitch of a sound?

- A) Amplitude
- B) Frequency
- C) Velocity
- D) Medium

Correct Answer: B

Explanation: Higher frequency $\rightarrow$ higher pitch.

Q12. The distance between two consecutive crests is:

- A) Amplitude
- B) Period
- C) Wavelength
- D) Frequency

Correct Answer: C

Explanation: Wavelength λ is distance between identical points.

Q13. Which of the following waves can travel through vacuum?

- A) Sound
- B) Water
- C) Light
- D) Seismic P-waves

Correct Answer: C

Explanation: Light is an electromagnetic wave; no medium needed.

Q14. Which property of sound is affected by the medium's temperature?

- A) Frequency
- B) Velocity

- C) Amplitude
- D) Wavelength

Correct Answer: B

Explanation: Sound speed increases with temperature.

Q15. In which wave do particles oscillate about their mean positions?

- A) Electromagnetic wave
- B) Matter wave
- C) Mechanical wave
- D) Stationary wave

Correct Answer: C

Explanation: Mechanical waves involve particle vibrations about equilibrium.

Q16. The phenomenon of superposition leads to:

- A) Interference
- B) Diffraction
- C) Reflection
- D) Refraction

Correct Answer: A

Explanation: Interference occurs when two waves superimpose.

Q17. Beats are produced by:

- A) Two waves of same frequency
- B) Two waves of slightly different frequencies
- C) Two perpendicular waves
- D) Two waves of different amplitudes only

Correct Answer: B

Explanation: Beats result from interference of slightly different frequencies.