Unit 12: Waves

50 MCQs. Correct option in bold. 1 mark each.

1. Waves are carriers of
A. heat only — **B. energy and information**
C. matter only — D. mass only

2. Waves transfer
A. both matter and energy — B. neither matter nor energy
C. matter without transferring energy — **D. energy without transferring matter**

3. A wave in a rope is an example of a
A. transverse wave — B. sound wave
C. seismic P-wave — D. longitudinal wave

4. The shortest distance between points where the wave pattern repeats itself is the
A. amplitude — B. time period
C. wavelength — D. frequency

5. The maximum value of upward displacement within a cycle is called a
A. trough — **B. crest**
C. rarefaction — D. node

6. The lowest point in a cycle of a transverse wave is called a
A. compression — B. crest
C. trough — D. wavefront

7. The maximum displacement from the mean position on either side is called
A. amplitude — B. wave speed
C. wavelength — D. frequency

8. The number of cycles completed by an oscillating body in one second is called
A. amplitude — B. time period
C. wavelength — **D. frequency**

9. The SI unit of frequency is
A. hertz — B. metre — C. second — D. joule

10. The time required for one wave cycle to pass a point is called
A. wavelength — B. wave speed
C. frequency — **D. time period**

11. Time period and frequency are
A. directly proportional — **B. reciprocals of each other**
C. equal to each other — D. unrelated

12. The relation between time period T and frequency f is
A. $T = f^2$ — B. $T = 2f$ — **C. $T = 1/f$** — D. $T = f$

13. A body performing simple harmonic motion completes one vibration in 2 seconds. Its frequency is
A. 2 Hz — B. 10 Hz — C. 1 Hz — **D. 0.5 Hz**

14. 360 waves pass through a point in a river in one hour. The time period of the wave is
A. 10 s — B. 100 s — C. 1 s — D. 0.1 s

15. The time period of the vibrator of a ripple tank is 0.5 s. The frequency of the water waves is
A. 0.5 Hz — B. 200 Hz — **C. 2 Hz** — D. 50 Hz

16. The universal wave equation is
A. $v = \lambda/f$ — **B. $v = f\lambda$** — C. $v = f/\lambda$ — D. $v = f + \lambda$

17. The wave equation for electromagnetic waves is
A. $c = f/\lambda$ — B. $c = \lambda/f$ — **C. $c = f\lambda$** — D. $c = f - \lambda$

18. A rope wave has speed 2.5 m/s and wavelength 0.5 m. Its frequency is
A. 5 Hz — B. 0.2 Hz — C. 3 Hz — D. 1.25 Hz

19. A wave in a ripple tank has frequency 12 Hz and wavelength 3 cm. Its speed is
A. 36 m/s — **B. 0.36 m/s** — C. 4 m/s — D. 0.25 m/s

20. The frequency of red light of wavelength 700 nm in vacuum is about
A. 2.1×10^{15} Hz — B. 4.29×10^{8} Hz
C. 2.1×10^{2} Hz — **D. 4.29×10^{14} Hz**

21. The wavelength of radio waves from an FM station at 90 MHz is about
A. 33.3 m — B. 0.33 m — **C. 3.33 m** — D. 300 m

22. Which of the following characteristics of a wave is independent of the others?
A. amplitude — B. speed
C. wavelength — D. frequency

23. Waves that require a material medium for propagation are called
A. radio waves — **B. mechanical waves**
C. light waves — D. electromagnetic waves

24. Waves that do not require a material medium are called
A. seismic waves — B. mechanical waves
C. sound waves — **D. electromagnetic waves**

25. Which of the following is a mechanical wave?
A. Ultraviolet wave — **B. Sound wave**
C. Light wave — D. X-ray

26. In an electromagnetic wave, the electric and magnetic fields oscillate
A. perpendicular to each other and to the direction of propagation
B. along the direction of propagation
C. parallel to each other
D. only in the direction of the electric field

27. In a transverse wave, the vibrations are
A. parallel to the direction of wave motion
B. in the form of compressions
C. at right angles to the direction of wave motion
D. in circles

28. Which of the following is a transverse wave?
A. Sound — B. Seismic P-wave
C. Wave in a Slinky pushed along its length — **D. Light**

29. Waves on the surface of water are an example of
A. transverse waves — B. sound waves
C. longitudinal waves — D. seismic P-waves

30. Seismic S-waves are
A. longitudinal waves — B. sound waves
C. transverse waves — D. light waves

31. In a longitudinal wave, the vibrations are
A. absent
B. parallel to the direction of wave travel
C. circular
D. perpendicular to the direction of wave travel

32. Parts of a longitudinal wave having higher density and pressure are called
A. crests — B. troughs
C. rarefactions — **D. compressions**

33. Parts of a longitudinal wave having smaller density and pressure are called
A. compressions — B. troughs
C. rarefactions — D. crests

34. Which of the following is a longitudinal wave?
A. String waves — B. X-rays
C. Light — **D. Sound**

35. The fastest type of seismic wave is the
A. P-wave — B. light wave
C. surface wave — D. S-wave

36. Longitudinal waves move fastest through
A. gases — **B. solids** — C. vacuum — D. liquids

37. A ripple tank is used to study
A. properties of water waves — B. properties of sound only
C. heat transfer — D. electric current

38. The change in direction of a wavefront at a barrier so that it returns to the original medium is
A. refraction — B. diffraction
C. reflection — D. interference

39. The change in speed (and sometimes direction) of a wave when it enters another medium is
A. reflection — B. absorption
C. diffraction — **D. refraction**

40. When a water wave enters a medium in which it moves more slowly, its wavelength
A. increases — **B. decreases**
C. becomes infinite — D. remains the same

41. When water waves pass from deep to shallow water, their speed
A. increases
B. remains the same
C. becomes zero
D. decreases

42. When water waves pass from deep to shallow water, their frequency
A. decreases
B. increases
C. remains the same
D. becomes zero

43. The bending of waves around the corners of an obstacle is called
A. diffraction
B. reflection
C. refraction
D. interference

44. Diffraction is greatest when the size of the opening is
A. ten times the wavelength
B. less than or equal to the wavelength
C. a hundred times the wavelength
D. much greater than the wavelength

45. Wavelength or speed of a wave is _____ by diffraction.
A. decreased
B. increased
C. not affected
D. doubled

46. Waves with longer wavelengths diffract
A. not at all
B. equally with all wavelengths
C. less
D. more

47. Listening to radio transmission in the deep valleys of mountain areas is due to
A. reflection of waves
B. diffraction of waves
C. refraction of waves
D. interference of waves

48. Tsunamis are most often generated by
A. earthquakes
B. floods
C. bomb blasts
D. storms

49. In the deep sea, tsunami waves
A. are very high and fast
B. travel fast but are not very high
C. travel slowly and are very high
D. do not exist

50. When a tsunami approaches the coast, its speed
A. increases and its height increases
B. decreases and its height decreases
C. decreases while its height increases
D. increases while its height decreases