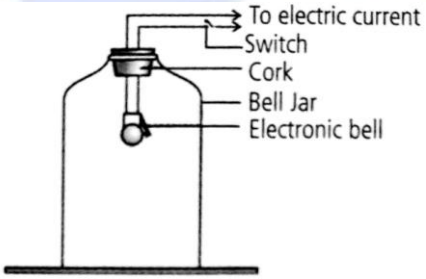
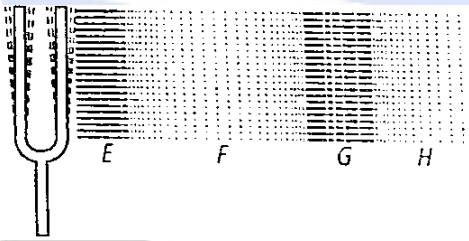
1. Which of the following statements are correct?
   (a) Sound is a form of energy which produces a sensation of hearing in our ears.
   (b) Sound cannot be produced without utilizing energy.
   (c) Vibrating objects produce sound.
   (d) All of these
2. the membrane of a drum vibrates to produce sound. Similarly the string of a sitar vibrates to produce sound. Which part of a whistle vibrates to produce sound?
   (a) Body of whistle (b) Air column
   (c) Mouth of the person (d) All of these
3. _____ is the vibrating part which enables us to speak.
   (a) Vocal cords (b) Larynx (c) Ears (d) Fingers
4. Mechanical wave can travel
   (a) in vacuum as well as in a medium (b) in vacuum but not in a medium
   (c) in a medium but not in vacuum (d) neither in a medium nor in vacuum.
5. An electric bell is suspended in a bell jar as shown. An observer outside the bell jar can see the clapper striking the bell but cannot hear any sound produced by the striking. What is a possible reason?



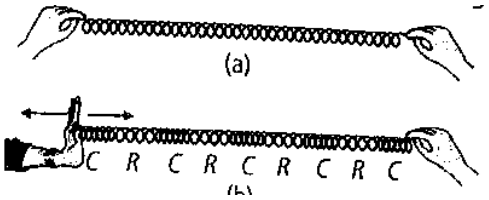
   (a) The bell jar is filled with water. (b) The bell jar has very thick glass.
   (c) The bell jar is filled with inert gas. (d) There is a vacuum in the bell jar.
6. In the figure given below, which of the following points shows the region of high density and low pressure respectively?



	High density	Low Pressure
(a)	F and H	E and G
(b)	E and G	E and G
(c)	E and G	F and H
(d)	F and H	F and H

7. Which of the following statement(s) is/are true about sound waves?
   (I) They are produced by vibrating objects. (II) They can travel through a vacuum.
   (III) They are longitudinal waves.
   (IV) The speed of sound is highest in gas and lowest in a solid.
   (a) I and II (b) I and III (c) I and IV (d) III and IV

8. A stretched slinky is given a sharp push along its length.



A wave travels from one end to another. The wave so produced is

(a) transverse wave (b) longitudinal wave

(c) stationary wave (d) none of these

9. A big explosion on the moon cannot be heard on the earth because

(a) the explosion produces high frequency sound waves which are inaudible

(b) sound waves require a material medium for propagation

(c) sound waves are absorbed in the moon's atmosphere

(d) sound waves are absorbed in the earth's atmosphere

10. Which one of the following properties of sound is affected by change in the air temperature?

(a) Frequency (c) Intensity (b) Amplitude (d) Wavelength

11. If you go on increasing the stretching force on a wire in? a guitar, its frequency

(a) increases (b) decreases

(c) remains unchanged (d) none of these

12. The speed of sound in a medium

(a) decreases with the increase in temperature

(b) decreases with the increase in pressure

(c) remains the same with the increase in temperature

(d) has different variations for different media.

13. A series of compressions and rarefactions of a sound wave is shown below. Given that the sound wave has a frequency of 1600Hz and a speed of 320ms^{-1}.

Calculate the distance between P and Q.

(a) 0.3 m (b) 0.4 m (c) 0.6 m (d) 0.8 m

14. The frequency of a high note is greater than that of a low note. It follows that the higher note has

(a) a shorter wavelength (b) a slower speed in air

(c) a longer wavelength (d) a greater speed in air.

15. A longitudinal wave is produced on a toy slinky. The wave travels at a speed of 30cms^{-1} and the frequency of the wave is 20Hz. What is the minimum separation between the consecutive compressions of the slinky?

(a) 1.0cm (b) 1.5cm (c) 2.5cm (d) 3.0cm

16. A light pointer fixed to one prong to a tuning fork touches a vertical plate. The fork is set vibrating and the plate is allowed to fall freely. If eight oscillations are counted when the plate falls through 10cm, the frequency of the tuning fork is

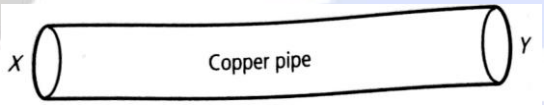
(a) 36Hz (b) 100Hz (c) 560Hz (d) 56Hz.

17. A boy sitting in a boat fires a gun. An observer P is at a distance of 50m from the boat. Another observer Q is a diver, who is 50m under water. Both hear the sound of gun, then
    (a) P hears the sound first
    (b) Q hears the sound first
    (c) both P and Q hear the sound at the same time
    (d) none of these

18. A gun is fired in the air at a distance of 660m from a person. He hears the sound of the gun after 2s . What is the speed of sound?
    (a) $330ms^{-1}$ (b) $360ms^{-1}$ (c) $370ms^{-1}$ (d) $390ms^{-1}$

19. An echo repeats two syllables. If the velocity of sound is $\beta 30ms^{-1}$, then the distance of the reflecting surface is
    (a) 66.0m (b) 33.0m (c) 99.0m (d) 16.5m .

20. The diagram below shows a large diameter copper pipe.



    In an experiment, a student at Y bangs the pipe and his helper at X hears two sounds, one arriving before the other. The most likely explanation for this is
    (a) the speed of sound through copper is greater than that through air
    (b) the speed of sound through copper is smaller than that through air
    (c) the speed of the reflected sound is greater than that of the incident sound
    (d) the speed of the reflected sound is smaller than that of the incident sound.

21. Which of the following changes when sound is reflected?
    (a) Wavelength (b) Frequency (c) Speed (d) Amplitude

22. A construction worker's helmet slips and falls when he is 78.4m above the ground. He hears the sound of the helmet hitting the ground 4.23 seconds after it slipped. Find the speed of sound in air.
    (a) $330ms^{-1}$ (b) $1500ms^{-1}$ (c) $341ms^{-1}$ (d) $746ms^{-1}$

23. A bat produces ultrasound and audible sound at the same time. Which of the following statements is true?
    (a) Ultrasound travels faster than the audible sound.
    (b) Ultrasound and audible sound have the same frequency.
    (c) The wavelength of the ultrasound is longer than the wavelength of the audible sound.
    (d) Ultrasound and audible sound will reach the same distance at the same time.

24. Human ear cannot hear those mechanical waves whose frequency lies in the frequency range
    (a) less than 100Hz but greater than 10000Hz
    (b) between 1000Hz and 5000Hz
    (c) between 500Hz and 20000Hz
    (d) less than 20Hz and more than 20000Hz .

25. The sound waves having a frequency more than 20,000Hz are called
    (a) infrasonic waves (b) supersonic waves
    (c) ultrasonic waves (d) hypersonic waves.

26. Of the following, the one which emits sound of higher pitch is
(a) mosquito (b) man (c) lion (d) woman.

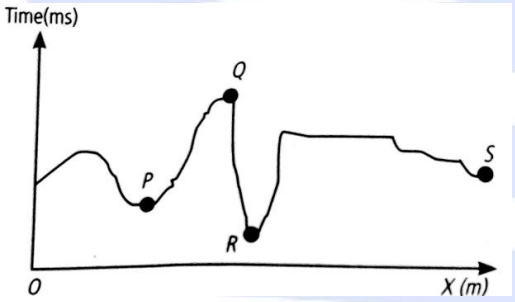
27. Ultrasonic, infrasonic and audible waves travel through a medium with speeds v_u, v_i and v_a respectively, then
(a) $v_1 = v_a = v_u$ (b) $v_u > v_0 > v_1$ (c) $v_u < v_a < v_i$ (d) $v_a \le v_a = v_u$.

28. A pendulum vibrates with a time period of 1 second. The sound produced by it is
(a) supersonic (b) audible (c) infrasonic (d) ultrasonic.

29. Which waves are used in sonography?
(a) Micro waves (b) Infrared rays (c) Sound waves (d) Ultrasonic waves

30. A submarine emits a sonar pulse, which returns from underwater cliff in $1.02s$. If the speed of sound in water is $1531ms^{-1}$, the submarine is at a distance of
(a) $780.8m$ from cliff (b) $718.8m$ from cliff
(c) $714.8m$ from cliff (d) none of these

31. Ultrasound is emitted from a ship directly downwards into the water. The diagram below shows the duration for ultrasound to return to the receiver on the ship as the ship travels from point X to point Y along the surface of the water. At which position is the water deepest?



(a) P (b) Q (c) R (d) S

32. A marine survey ship emits a sound wave straight to the sea bed. It detects an echo $4.0s$ later. Which is a possible depth of the sea?
(a) $600m$ (b) $1500m$ (c) $3000m$ (d) $10000m$

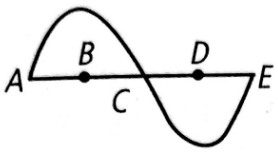
33. A sonar signal from a ship is emitted underwater towards the sea bed. It takes $0.7s$ for the signal to bounce back from the sea bed. If sound travels at $1500ms^{-1}$ in water, how deep is the sea?
(a) $525m$ (b) $1050m$ (c) $1071m$ (d) $2143m$

34. Note is a sound
(a) of mixture of several frequencies (b) of mixture of two frequencies only
(c) of a single frequency (d) always unpleasant to listen.

35. In SONAR, we use
(a) ultrasonic waves (b) infrasonic waves
(c) radio waves (d) audible sound waves.

36. When we change feeble sound to loud sound we increase its
(a) frequency (b) amplitude (c) velocity (d) wavelength.

37. In the curve half the wavelength is



(a) AB (b) B (c) DED (d) AE

38. Earthquake produces which kind of sound before the main shock wave begins?

(a) Ultrasound (b) Infrasound (c) Audible sound (d) None of these

39. Before playing the orchestra in a musical concert, a sitarist tries to adjust the tension and pluck the string suitably. By doing so, he is adjusting

(a) intensity of sound only

(b) amplitude of sound only

(c) frequency of the sitar string with the frequency of other musical instruments

(d) loudness of sound.

Assertion-Reason Codes:

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true and Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.

(d) If both Assertion and Reason are false.

40. Assertion: The flash of lightening is seen before the sound of thunder is heard.

Reason : Speed of sound is greater than speed of light.

41. Assertion: The frequency of an open organ pipe increases as the temperature is increased.

Reason : This is because as the temperature increases, the velocity of sound increases more rapidly than length of the pipe.

42. Assertion: On a rainy day sound travels slower than on a dry day.

Reason: When moisture is present in air the density of air increases.

43. Assertion: The longitudinal waves are called pressure waves.

Reason: Propagation of longitudinal waves through a medium involves changes in pressure and volume of air, when compression and rarefaction are formed.

44. Assertion: Waves produced in a cylinder containing a liquid by moving its piston back and forth are longitudinal waves.

Reason: In longitudinal waves, the particle of the medium oscillate parallel to the direction of propagation of the wave.

45. Assertion: Transverse waves can be produced in liquids

Reason : Light waves are transverse waves.

46. Assertion: Sound would travel faster on a hot summer day than on a cold winter day.

Reason : Velocity of sound is directly proportional to the square of its absolute temperature.