Saitechinfo NEET JEE Academy

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SOUND

Class 09 - Science

Time Allowed: 1 hour and 30 minutes **Maximum Marks: 45**

1. A key of a mechanical piano struck gently and then struck again but much harder this time. In the second case **[1]**

   a) sound will be louder but pitch will not be differ

   b) both loudness and pitch will remain unaffected

   c) sound will be louder and pitch will also be higher

   d) sound will be louder but pitch will be lower

2. The penetrating power of ultrasonic waves and other audible sounds are given as f_1 and f_2 respectively. Then **[1]**

   a) $f_1 > f_2$

   b) $f_1 = 2f_2$

   c) $f_1 < f_2$

   d) $f_1 = f_2$

3. The minimum size of a room required to hear an echo of sound with a speed of 300 m/s is **[1]**

   a) 17 m

   b) 15 m

   c) 16 m

   d) 14 m

4. S.I unit of sound waves wavelength is: **[1]**

   a) Metres

   b) metres/second

   c) meters/second^2

   d) metres^2

5. SI unit of frequency is: **[1]**

   a) (second)^2

   b) second

   c) (second)$^{-2}$

   d) hertz

6. Sound of crackers is heard during festival days, but the sound of supernova explosion in space is not heard on the surface of earth because of **[1]**

   a) lesser gravity

   b) the influence of the other planets

   c) large distance

   d) absence of medium

7. A man who is standing at a point between two parallel walls fires a pistol. He hears echoes after 0.5 s and 0.8 s. A further echo is heard, after firing, at a time of _____. **[1]**

   (Speed of sound = 330 m s^{-1})

   a) 1.1 s

   b) 1.3 s

   c) 2.6 s

   d) 2.2 s

8. Infrasound can be heard by **[1]**

a) human beings
b) rats
c) rhinoceros
d) bat

9. Ramjeet, while verifying the laws of reflection of sound, measured the angled between the incident sound wave and reflected wound wave to be 130^o. The angle of incidence is: **[1]**

a) 65^o
b) 25^o
c) 130^o
d) data insufficient

10. Light is a: **[1]**

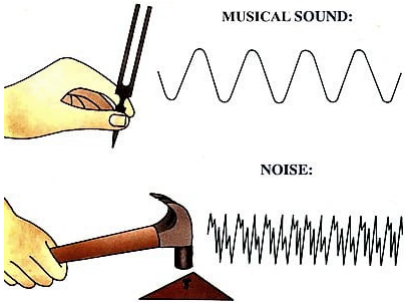
a) Transverse wave
b) Longitudinal wave
c) None
d) Both

11. Two children are at opposite ends of an aluminium rod. One strikes the end of the rod with a stone. Find the ratio of times taken by the sound wave in air and in aluminium to reach the second child. **[3]**

12. Study the given below diagram and answer the following questions: **[3]**

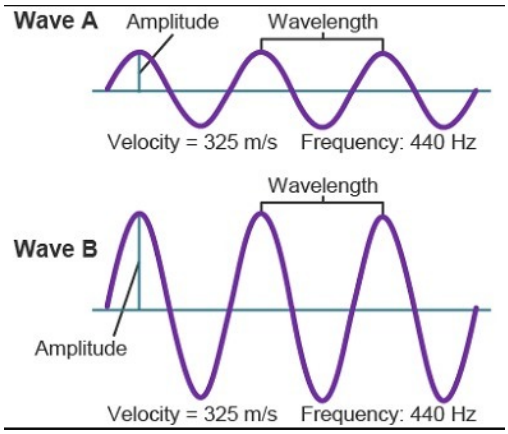
i. Identify the application of ultrasound in the above diagram.
ii. Explain the working principle of this medical procedure.
iii. What is the range of frequencies associated with ultrasound?

13. Observe the following diagram and answer the following questions: **[3]**



i. What is the difference between longitudinal and transverse wave?
ii. Mention the three characteristics of sound.
iii. What is the crest and trough?

14. Observe the given figure and answer the following questions: **[3]**



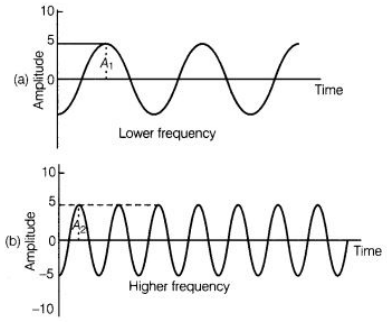
i. Identify the characteristics of the two graphs as shown above in the given figure.

ii. What is the relationship between the velocity of sound, its wavelength, and frequency?

iii. What is the term for the magnitude of the maximum disturbance in the medium on either side of the mean value?

iv. Give the unit of frequency?

15. Observe the following graphical diagram and answer the following questions: **[3]**



i. What is represented by the graphical diagram shown above?

ii. Which wave characteristic determine the pitch of sound?

iii. What is the relationship between pitch and frequency?

16. Explain the working and application of a sonar. **[5]**

17. i. Sound is produced when your school bell is struck with a hammer. Why? **[5]**

ii. A powerful sound signal sent from a ship is received again after 4.8 seconds. How deep is the ocean bottom? (Speed of sound in water = 1500 m/s).

18. i. How will you determine the depth of a sea using echo ranging in SONAR method? **[5]**

ii. A SONAR device on a submarine sends out a signal and receives an echo 5s later. Calculate the speed of sound in water if the distance of the object from the submarine in 2625 m.

19. i. What is echo ranging? State any one application of this technique. **[5]**

ii. The wavelength of waves produced on the surface of the water is 20 cm. If the wave velocity is 36 m/s. Calculate

a. The number of waves produced in one second.

b. The time required to produce one wave?