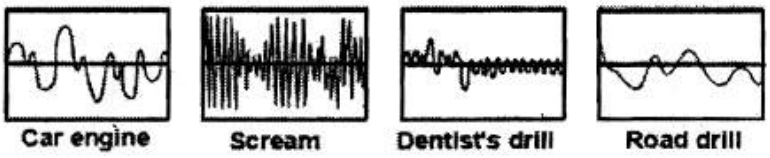
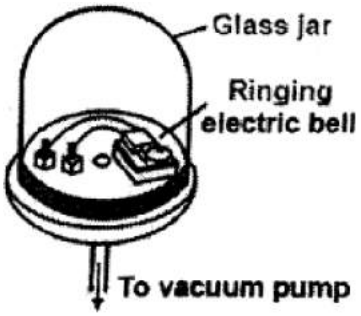
# CONCEPT APPLICATION LEVEL - III [Previous Years]

Q.1 The oscilloscope traces for sound waves with different frequencies are shown below. The noises shown in the diagram in the increasing order of frequency are a :



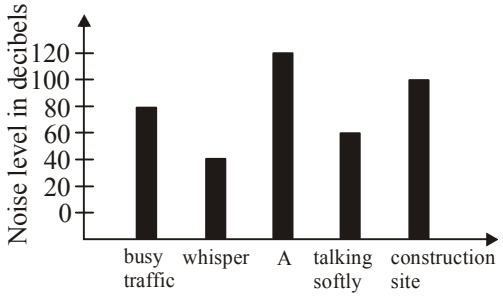

(1) Car engine, Scream, Dentist's drill, Road drill
(2) Road drill, Car engine, Dentist's drill, Scream
(3) Scream, Car engine, Dentist's drill, Road drill
(4) Dentist's drill, Road drill, Scream, Car engine

Q.2 A scientist performed an experiment as shown in the figure. What happened when air was pumped out of the jar completely and he rang the bell ?




(1) The sound became louder
(2) The sound became fainter first and then louder once all the air was pumped out
(3) The sound could not be heard anymore
(4) The sound was the same as before

Q.3 The graph shown here provides information about noise levels in different situations. Which of the following scenarios can create a noise level as indicated on the graph by the letter A ?




(1) A plane taking off
(2) A few dogs barking
(3) Some people talking loudly
(4) Metro train moving on tracks

Q.4 Which of the following is/are correct ?
(A) Besides helping in finding distance of an object, SONAR also indicates its range
(B) Megaphone is a device which works on the principle of reflection of sound
(C) Ultrasonics are used to detect earthquakes
(D) Like light, sound waves also obey laws of reflection.
(1) B, C and D (2) A, B and C (3) A, B and D (4) A, C and D

Q.5 Which of the following does not produce a sound wave ?
(1) A silencer fixed gun fired (2) A bell ringing under water
(3) A hammer hitting a block of rubber (4) An explosion on the moon

Q.6 Sonic vibrations were sent down from a ship return after 2 seconds. What is the depth of the sea, if the speed of sound in water is 1.5 km $s^{-1}$ ?
(1) 150 m (2) 3 km (3) 1.5 km (4) 750 m

Q.7 Read the given statements and select the correct option.
**Statement 1 :** The velocity of sound decreases with increases in humidity
**Statement 2 :** The velocity of sound depends upon the density of medium
(1) Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1
(2) Both statement s 1 and 2 are true but statement 2 is not the correct explanation of statement 1
(3) Statement 1 is true but statement 2 is false
(4) Statement 1 is false but statement 2 is true

Q.8 In an experiment to measure the speed of sound in air, a boy stands 40 m from a wall and bangs two pieces of wood together. At the instant he hears the echo, he bangs them together again. He does this activity 50 times. The time taken for 50 bangs is 12 s. Which calculation gives the speed of sound in air ?

(1) $\frac{12}{40\times 50}$ (2) $\frac{40\times 50}{12}$ (3) $\frac{40\times 2\times 50}{12}$ (4) $\frac{40\times 2\times 12}{50}$

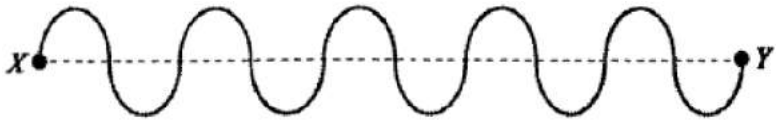
Q.9 Shweta observes lightning in her area. She hears the sound 5 s after the observed lighting. How far is she from the place where lightning occurs if speed of sound in air is 330 m $s^{-1}$.
(1) 1.65 km (2) 2.55 km (3) 3.65 km (4) 4.55 km

Q.10 While playing a violin, in which of the following the vibrations can take place ?
(1) The wire only (2) Air only
(3) The box only (4) Both the wire and box

Q.11 Bees which are not carrying honey fly with a flapping frequency of 440 Hz while those which are carrying honey fly with a flapping frequency of 300 Hz. The sound made by bees which are not carrying honey has :
(1) A lower pitch (2) A higher pitch (3) A smaller loudness (4) A greater loudness

Q.12 Two wave pulses travel in opposite directions on a string and approach each other. The shape of one pulse is inverted with respect to the other.
(1) The pulse will collide with each other and vanish after collision
(2) The pulses will reflect each other, that is pulse going towards right will finally move towards left and vice versa
(3) The pulses will pass through each other but their shapes will be modified
(4) The pulses will pass through each other without any change

Q.13 A particle follows a path XY as shown in the given figure. If the radius of semi-circular path is 2 cm then the approximate value of distance covered and displacement of the particle are respectively.

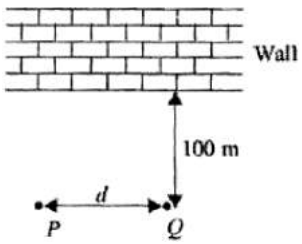



(1) 20 cm and 10 cm (2) 30 cm and 23 cm
(3) 20 cm and 60 cm (4) 63 cm and 40 cm

Q.14 A man standing in front of a large wall, claps two objects against each other at an interval of 1.2 s regularly. The echo of the first clap coincides with the fifth clap. If the speed of sound in air is 340 m $s^{-1}$, the distance between the man and the wall is _____ .
(1) 408 m (2) 1632 m (3) 816 m (4) 204 m

Q.15 When the tension in the string of a guitar is increased, but other factors remain unchanged, the sound produced _____ .
(1) Is louder
(2) Has higher pitch
(3) Has longer wavelength
(4) Travels faster

Q.16 Two persons P and Q are standing at a distance of 100 m from a high wall as shown in the given figure. When P gives a clap, the time interval between the two (direct and reflected) sounds heard by Q is 0.2 s. If the speed of sound is 340 m $s^{-1}$, then the distance d between P and Q is :




(1) 160 m (2) 260 m (3) 290 m (4) 320 m