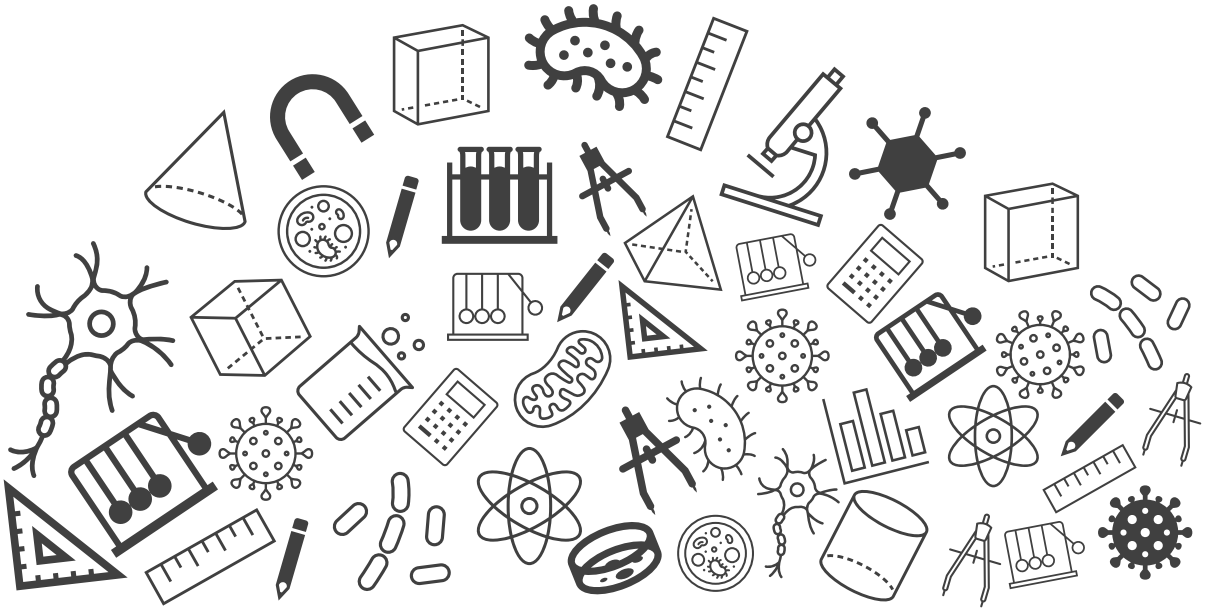
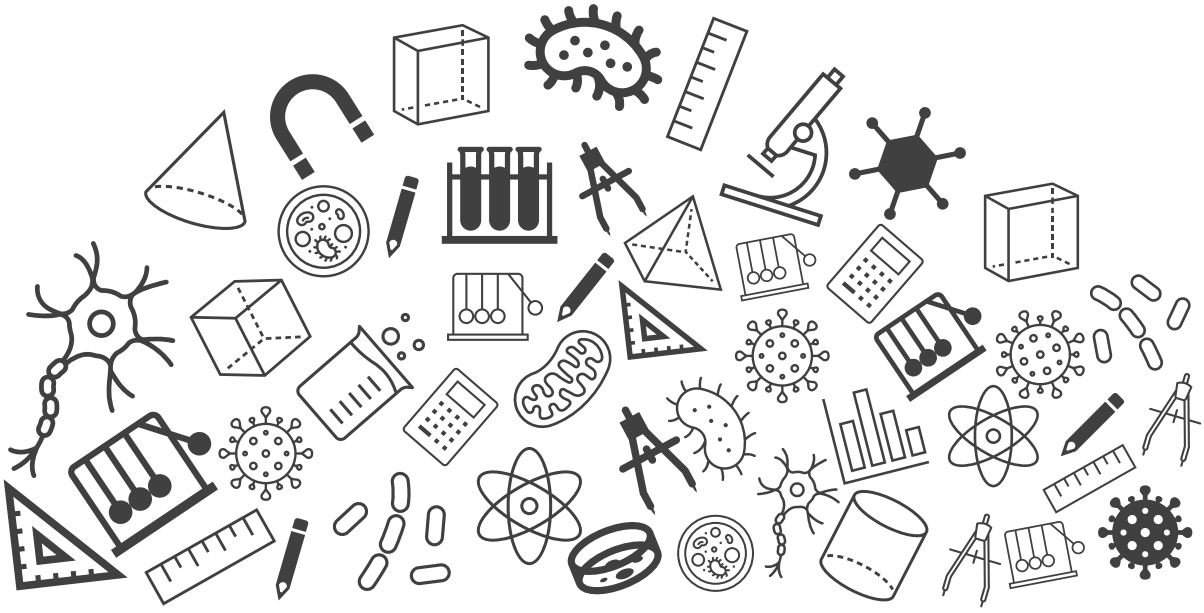
Grade 08 : Science
Exam Important Questions



Sound



Sound: Audible Range and Noise Pollution

Topic : Exam Important Questions

1. The sound from a mosquito is produced when it vibrates its wings at an average rate of 500 vibrations per second. What is the time period of the vibration? [2 marks]

   1. Time Period given by the inverse of the frequency.
   [1 Mark]
   2. Time Period= 1/Frequency of oscillation = 1/500 = 0.002 sec.
   [1 Mark]

2. A pendulum oscillates 40 times in 4 seconds. Find its time period and frequency.
   [3 marks]

   Given:
   Total number of oscillations = 40
   Total time taken to complete 40 oscillations = 4 seconds

   We know that frequency refers to the number of waves that pass a fixed point in unit time. [0.5 marks]

   So,
   f = $\frac{40}{4}$
   f = 10 Hz
   [1 mark]

   Time period is the time taken for one oscillation. [0.5 marks]
   Also, Time period = $\frac{1}{frequency}$
   So,
   T = $\frac{1}{10}$
   T = 0.1 s
   [1 mark]

   So, the time period is 0.1 s and the frequency is 10 Hz.

3. Explain in what ways is noise pollution is harmful.

[3 marks]

[NCERT]

[Noise pollution]

Solution:
Many health issues are associated with noise pollution. Some of them are as follows-

(a) Stress

(b) Headache

(c) Hearing loss

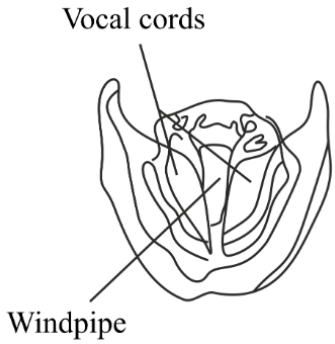
(d) Insomnia

(e) Hypertension

Not just humans, even for animals, noise pollution can have these adverse effects. For example, birds and bats may have trouble finding food in noisy areas as they can't hear their prey.
[3 marks]

4. Sketch larynx and explain its function in your own words.
[3 marks]

Solution:
In humans, sound is produced by the larynx or voice box which is located at the upper end of the windpipe.
[0.5 marks]

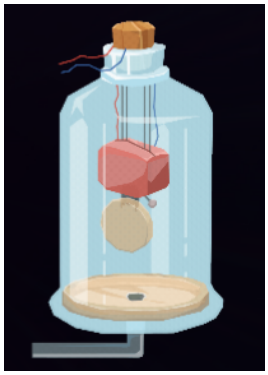


[1 mark]

Two vocal cords are stretched across the larynx in such a way that it leaves a narrow slit between them for passage of air. The lungs force air into the gap when we speak. This causes the vocal cords to vibrate due to which sound is produced.
[1.5 marks]

Sound: Audible Range and Noise Pollution

5. An alarm bell is kept inside a vessel as shown below. A person standing close to it can distinctly hear the sound of alarm. Now if the air inside the vessel is removed completely how will the loudness of alarm get affected for the same person. [2 mark]



Solution:
The loudness of the sound will decrease as the air is slowly removed from the vessel. [1 mark]
When the air inside the vessel is completely removed, there is a vacuum created in the bottle. The sound cannot travel through vacuum, and the person cannot hear sound of the alarm clock at all. [1 mark]

6. What determines the loudness of a sound? What is the unit of loudness? [1 marks]

1. Loudness is determined by the amplitude of vibration.
[0.5 Mark]
2. Unit of loudness is decibel.
[0.5 Mark]

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7. Lightning and thunder occur at the same time and at the same distance from us. Yet, lightning is seen earlier than thunder is heard. Can you explain this? [2 marks]

Speed of sound is much less compared to the speed of light. For instance, the speed of sound in air is approximately 330 m/s while the speed of light in air is approximately 3×10^8 m/s. (1 mark)

As speed of light is much greater than the speed of sound, light takes less time to reach us and lightning is seen earlier than thunder is heard. (1 mark)

8. Two astronauts are floating close to each other in space. Can they talk to each other without using any special device?
Give reason.
[2 marks]

No, they cannot talk to each other without using any special device.
[1 mark]

This is because there is no medium in space and sound needs medium to propagate.
[1 mark]

9. Pitch of sound is determined by its
a. frequency
b. amplitude
c. speed
d. loudness

Pitch of sound

- **Pitch** is defined as the highness and the lowness of sound. The pitch or shrillness of the sound depends on its frequency.
- If the frequency of the sound is high, the pitch is also high. Similarly, if the frequency is low, the pitch is also low.
- It can help to distinguish between sounds of the same loudness.

Hence, option a is correct.

Sound: Audible Range and Noise Pollution

10. Voice of which of the following is likely to have a minimum frequency?
[2 marks]
[NCERT]
[Frequency and pitch]

- **A.** Baby girl
- **B.** Baby boy
- **C.** A man
- **D.** A woman

Solution:
When compared to the voice of a baby girl, a baby boy, and a woman, the frequency of the voice of a man is the least.
[1 mark]

This is because men have comparitively longer vocal cords. And we know that more the length of the vocal cords, less is the frequency.
[1 mark]