

# Science

## Prep.2

*Second Term 2025*

# February Revision

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Unit One

\* طبقاً لأخر تعديل في المادة للعام الدراسي 2024-2025



# February Revision

**Mr. Ahmed Elbasha**

✱ **(1) Write the scientific term:**

- 1 The distance covered by the wave in one second. (.....)

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- 2 Maximum displacement of the oscillating body away from its rest position. (.....)

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- 3 It is a disturbance in which the particles of the medium vibrate along the direction of wave propagation. (.....)

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- 4 The motion produced as a result of the vibration of the particles of the medium at a certain moment in a definite direction. (.....)

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- 5 The number of complete oscillations produced by the oscillating body in one second. (.....)

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- 6 The time taken by the oscillating body to make one complete oscillation. (.....)

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- 7 The highest point in the transverse wave. (.....)

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- 8 Waves that need medium to travel and can't travel in space (.....)

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- 9 The point of the lowest density and pressure in the longitudinal wave (.....)

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- 10 The time needed by the oscillatory body to make a complete oscillation. (.....)

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- 11 The maximum displacement achieved by an oscillating body away from its point of rest. (.....)

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- 12 The area in the longitudinal wave, at which the medium particles are of the highest density and pressure (.....)

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- 13 Wave consists of crests and troughs. (.....)

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- 14 The waves which need a medium to propagate. (.....)

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- 15 The motion produced because of the vibration of the particles of the medium at a certain moment and in a certain direction (.....)

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- 16 The distance between two successive compressions or rarefactions in a longitudinal wave. (.....)

**\*(2) Choose the right answer:**

1. **The amplitude of the simple pendulum is ..... of a complete vibration.**  
a. four times.                      b. a quarter.                      c. a half.                      d. double.
2. **Light waves are ..... waves.**  
a. mechanical transverse                      b. electromagnetic longitudinal  
c. electromagnetic transverse                      d. mechanical longitudinal
3. **Speed of ball of simple pendulum ..... as we move away from the rest position.**  
a. doesn't affect                      b. decreases                      c. is doubled                      d. no correct answer
4. **If the distance between the center of the third compression and that of the fifth compression is 20 cm, the wavelength of this wave is .....**  
a. 40 cm.                      b. 20 cm.                      c. 10 cm.                      d. 5 cm.
5. **The distance between two successive compressions is called .....**  
a. frequency.                      b. periodic time.                      c. wavelength.                      d. velocity.
6. **The periodic time of a tuning fork which makes 240 waves in one minute equals ....**  
a. 1 sec.                      b. 4 sec.                      c. 0.5 sec.                      d. 0.25 sec.
7. **..... waves are longitudinal waves.**  
a. Water                      b. Light                      c. Sound                      d. Radio
8. **The measuring unit of wave velocity is .....**  
a. metre.                      b. metre/sec.                      c. Hz.                      d. sec.
9. **All the following are electromagnetic waves except ..... waves.**  
a. light                      b. sound                      c. infrared                      d. radio
10. **The maximum displacement made by the oscillating body away from its original position is .....**  
a. amplitude.                      b. frequency.                      c. periodic time.                      d. complete.
11. **Velocity of sound in air equals ..... m/s.**  
a. 340                      b. 1500                      c.  $3 \times 10^8$
12. **The result of multiplying frequency of an oscillating body by its periodic time equals .....**  
a. one.                      b. negative value.                      c. constant value.                      d. variable value.
13. **Each complete oscillation consists of ..... amplitudes.**  
a. 3                      b. 4                      c. 2                      d. 5

✱(3) **Complete the following :**

1. The crest in the ..... wave is equivalent to the ..... in the longitudinal wave.
2. Transverse wave consists of ..... and .....
3. Waves are classified according to the ability to propagate and transfer energy to ..... and ..... waves.
4. Complete oscillation consists of ..... displacements (amplitudes).
5. Sound wave velocity = ..... x .....
6. Sound travels through air as pulses of ..... and .....
7. .... are transverse waves, while ..... waves may be longitudinal or transverse waves.
8. There are two types of periodic motion which are ..... motion and ..... motion.
9. Sound waves are longitudinal waves because particles of the medium vibrate ..... the direction of wave propagation.

✱(4) **Correct the underlined words:**

1	The crest in the transverse wave is equivalent to the <u>bottom</u> in the longitudinal wave	( ..... )
2	The movement of the clock pendulum is an example of <u>wave motion</u> .	( ..... )
3	<u>Oscillatory</u> motion is the motion that is repeated regularly in equal periods of time.	( ..... )
4	Speed of sound in water is slower than in <u>air</u> .	( ..... )
5	The result of multiplying the frequency of an oscillating body by its periodic time equals <u>variable value</u> .	( ..... )
6	Particles of the medium vibrate along the direction of the wave propagation in the <u>transvers waves</u> .	( ..... )

**\*(5) Give reason for:**

1. The periodic time decreases as the number of complete oscillations increases.  
.....  
.....
2. The waves produced due to vibration of strings are transverse mechanical waves.  
.....  
.....
3. Sound waves are mechanical waves while radio waves are electromagnetic waves.  
.....  
.....
4. Light can travel through free space.  
.....  
.....
5. We see lightning before hearing thunder.  
.....  
.....
6. Oscillatory motion is considered as a periodic motion.  
.....  
.....
7. Sound can be heard from all surrounding directions.  
.....  
.....
8. Water waves are mechanical transverse waves.  
.....  
.....
9. A light wave are considered electromagnetic waves.  
.....  
.....

**\*(6) What happen if:**

1. The frequency of an oscillating body increases (concerning its periodic time) .  
.....
2. The oscillating body passes its rest position during its movement  
(Concerning its velocity).  
.....
3. The frequency of a wave is doubled (concerning the wavelength) when the wave  
velocity is constant.  
.....
4. Vibration of particles of a medium perpendicularly to the direction of wave  
propagation.  
.....
5. The sound wave travels from solid to water (concerning its velocity)  
.....

**\*(7) Put (√) or (X) :**

1. The movement of pendulum is an example for wave motion. ( )

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2. Sound can be heard from all directions that surround the sound source. ( )

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3. Sound velocity through liquids is more than that through gases. ( )

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4. The particles of the medium vibrate along the direction of the wave propagation in longitudinal wave ( )

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5. Light waves are electromagnetic transverse wave. ( )

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6. The sound velocity through solids is less than that through liquids. ( )

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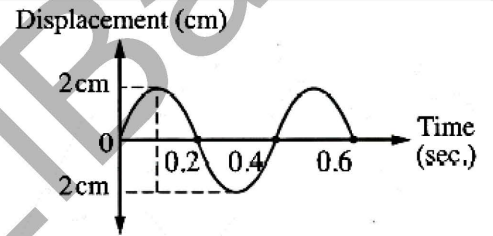
7. The transverse wave consists of compressions and troughs. ( )

**\*(8) Problems**

1

From the opposite figure, calculate :

1. Amplitude.
2. Periodic time.
3. Frequency.



.....

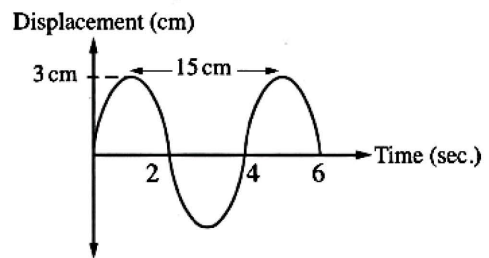
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2

From the opposite figure, calculate :

1. Wavelength.
2. Frequency.
3. Amplitude.
4. Periodic time.



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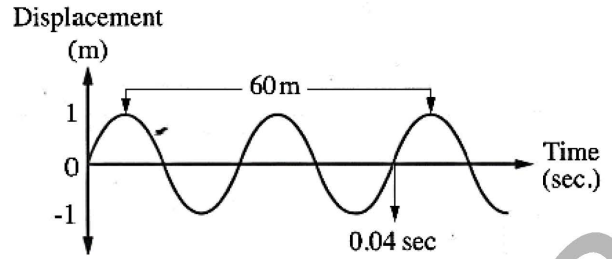
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3

From the opposite figure, calculate :

1. Frequency.
2. Wavelength.
3. Velocity of the wave.



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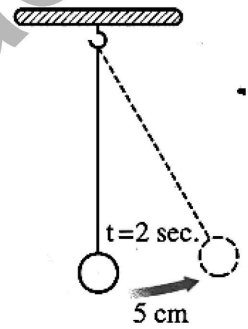
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4

From the opposite figure, calculate the following :

1. Amplitude.
2. Periodic time.
3. Frequency.



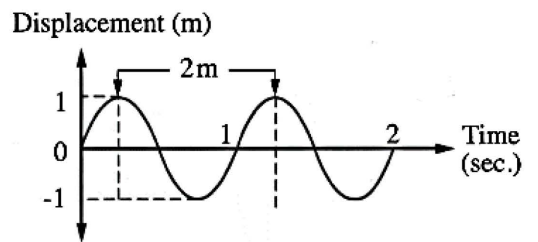
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5

From the opposite figure, find :

1. Wavelength.
2. Frequency.
3. Amplitude.
4. Wave velocity.



.....

.....

.....

## Model Answer

### ✱ (1) Write the scientific term :

- |                      |                     |                      |                                      |
|----------------------|---------------------|----------------------|--------------------------------------|
| 1. Wave velocity     | 6. Periodic time    | 11. Amplitude        | 16. Wavelength of longitudinal waves |
| 2. Amplitude         | 7. Crest            | 12. Compression      |                                      |
| 3. Longitudinal wave | 8. Mechanical waves | 13. Transvers waves  |                                      |
| 4. Wave motion       | 9. Rarefaction      | 14. Mechanical waves |                                      |
| 5. Frequency         | 10. Periodic time   | 15. Wave motion      |                                      |

### ✱ (2) Choose the right answer:

- |      |      |      |      |      |
|------|------|------|------|------|
| 1. B | 4. C | 7. C | 10.A | 13.B |
| 2. C | 5. C | 8. B | 11.A |      |
| 3. B | 6. D | 9. B | 12.A |      |

### ✱ (3) Complete the following:

- |                                 |                              |                                 |
|---------------------------------|------------------------------|---------------------------------|
| 1. Transverse – compression     | 4. Four                      | 7. Electromagnetic – mechanical |
| 2. Crest - trough               | 5. Frequency x wavelength    | 8. Oscillatory – wave           |
| 3. Electromagnetic – mechanical | 6. Compression – rarefaction | 9. Along                        |

### ✱ (4) Correct the underlined words:

- |                |             |                       |
|----------------|-------------|-----------------------|
| 1. Compression | 3. Periodic | 6. Longitudinal waves |
| 2. Oscillatory | 4. Wood     |                       |
|                | 5. One      |                       |

### ✱ (5) Give reason for:

1. Because the number of complete oscillations is inversely proportional to the periodic time.
2. They are transverse because the medium particles vibrate perpendicular to the direction of wave propagation forming crests and troughs and mechanical because they need a medium to propagate through.
3. Because sound waves need a medium to propagate through, while radio waves don't need a medium to propagate through.
4. Because it is electromagnetic waves which don't need a medium to travel through.
5. Because the velocity of light waves of lightning (electromagnetic waves) is much greater than that of sound waves of thunder (mechanical waves).
6. Because it is repeated regularly in equal periods of time.
7. Because sound travels through air as spheres of compressions and rarefactions whose center is the sound source
8. They are transverse because the medium particles vibrate perpendicular to the direction of wave propagation forming crests and troughs and mechanical because they need a medium to propagate through.
9. Because Light waves don't need a medium to propagate through.

### \*(6) What happen if:

1. The periodic time will decrease
2. Its velocity increases to the maximum value.
3. The wavelength decreases to its half value.
4. Transverse waves are formed
5. Sound velocity will decrease, since velocity of sound through solids is higher than the velocity of sound through liquids

### \*(7) Put ( $\checkmark$ ) or ( X ) :

- |                     |                     |          |
|---------------------|---------------------|----------|
| 1. ( X )            | 4. ( $\checkmark$ ) | 7. ( X ) |
| 2. ( $\checkmark$ ) | 5. ( $\checkmark$ ) |          |
| 3. ( $\checkmark$ ) | 6. ( X )            |          |

### \*(8) Problems

<b>1</b>	1. Amplitude = 2 cm = 0.02 m. 2. Periodic time = 0.4 sec. 3. Frequency = $\frac{1}{\text{Periodic time}} = \frac{1}{0.4} = 2.5 \text{ Hz.}$	<b>5</b>	1. Amplitude = 5 cm = 0.05 m. 2. Periodic time = $4 \times 2 = 8 \text{ sec.}$ 3. Frequency = $\frac{1}{\text{Periodic time}} = \frac{1}{8} = 0.125 \text{ Hz.}$
<b>2</b>	1. Wavelength = 15 cm = 0.15 m. 2. Frequency = $\frac{1}{4} = 0.25 \text{ Hz.}$ 3. Amplitude = 3 cm = 0.03 m. 4. Periodic time = $\frac{1}{0.25} = 4 \text{ sec.}$	<b>6</b>	1. Wavelength = 2 m. 2. Frequency = $\frac{\text{Number of complete oscillations}}{\text{Time in seconds}} = \frac{2}{2} = 1 \text{ Hz.}$ 3. Amplitude = 1 m. 4. Wave velocity = Wavelength $\times$ Frequency $= 2 \times 1 = 2 \text{ m/sec.}$
<b>3</b>	1. Frequency = $\frac{2}{0.04} = 50 \text{ Hz.}$ 2. Wavelength = $\frac{60}{2} = 30 \text{ m.}$ 3. Wave velocity = Frequency $\times$ Wavelength $= 50 \times 30 = 1500 \text{ m/sec.}$		