

## O Level Pure Physics MCQs

### General Wave Properties Test 2.0

Q1

A student makes five statements.

- All electromagnetic waves can travel in a vacuum.
- All waves obey the laws of reflection but some waves do not obey the laws of refraction.
- Sound is a longitudinal wave which travels in a direction parallel to the direction of vibrations.
- The distance between 3 consecutive crests of a transverse wave is equal to 3 wavelengths.
- Transverse waves transfer energy by transferring matter but longitudinal waves transfer energy without transferring matter.

How many statements is/are **not** correct?

- A 1
- B 2
- C 3
- D 4

Q2

Which of the following statement about waves is true?

- A They transfer energy with the transfer of particles of matter.
- B The frequency of the waves always increases as its wavelength decreases.
- C The period of a wave is the time taken for the particles to travel from the maximum positive displacement to the maximum negative displacement.
- D None of the above.

Q3

Fig 27.1 shows a transverse water wave that travels a distance 12 m from X to Y in 1.5 s. A particle O is on the wavefront A.

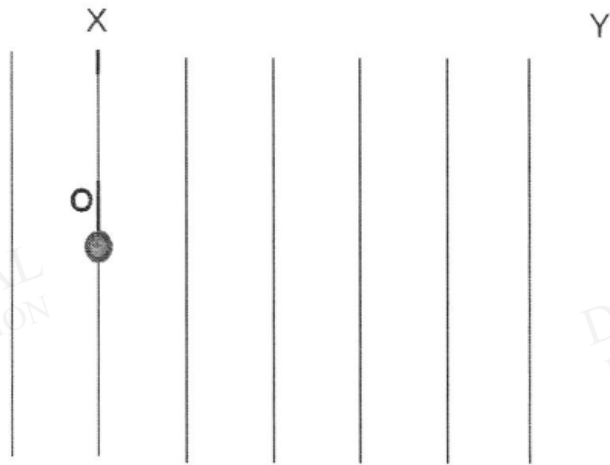


Fig 27.1

Fig 27.2 shows the displacement-distance graph of the same wave, where distance is measured from point X.

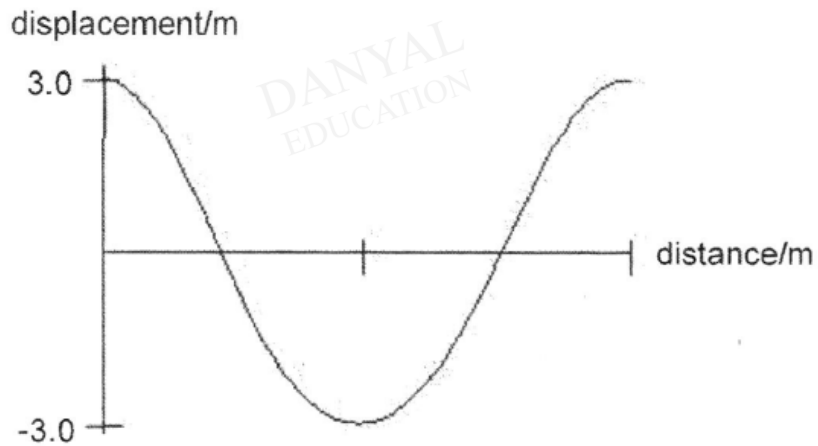


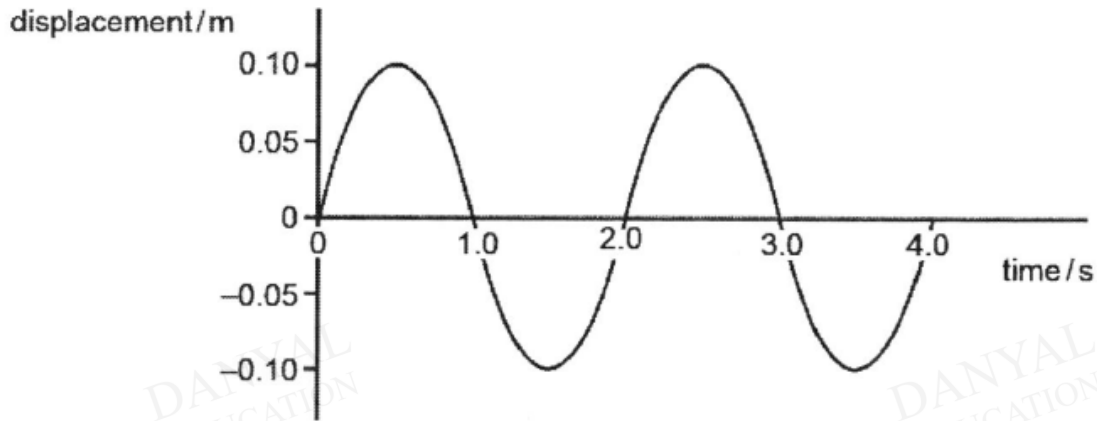
Fig 27.2

What is the displacement of O 0.50 s later from the instant shown in Fig 27.1?

- A** -3.0 m      **B** 0 m      **C** 1.5 m      **D** 3.0 m

Q4

The displacement-time graph below illustrates the motion of a wave.

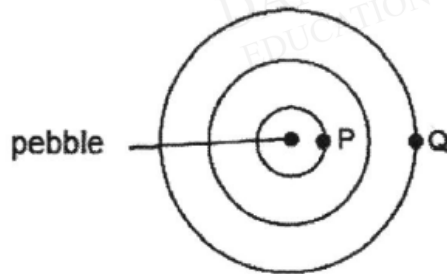


Given that the wavelength of the wave is 10 cm, the speed of this wave is \_\_\_\_\_.

- A 0.050 m/s
- B 0.20 m/s
- C 5.0 m/s
- D 20 m/s

Q5

A pebble is dropped into still water so that circular wavefronts are seen to travel outwards with a speed of  $v$ .

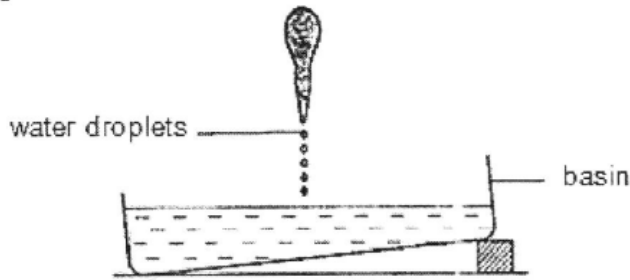


If the wavelength is  $\lambda$ , what is the time taken for the wave to travel from P to Q?

- A  $\lambda / (2v)$
- B  $\lambda / v$
- C  $3\lambda / (2v)$
- D  $2\lambda / v$

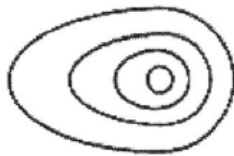
Q6

A tilted basin contains water. Water is dripped at a constant rate into the basin as shown in the diagram below.

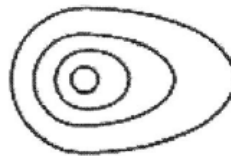


Which of the following pattern of the wavefronts will be observed in the basin as viewed from the top?

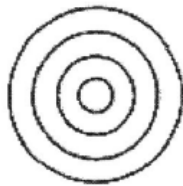
A



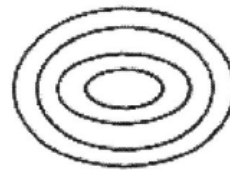
B



C



D

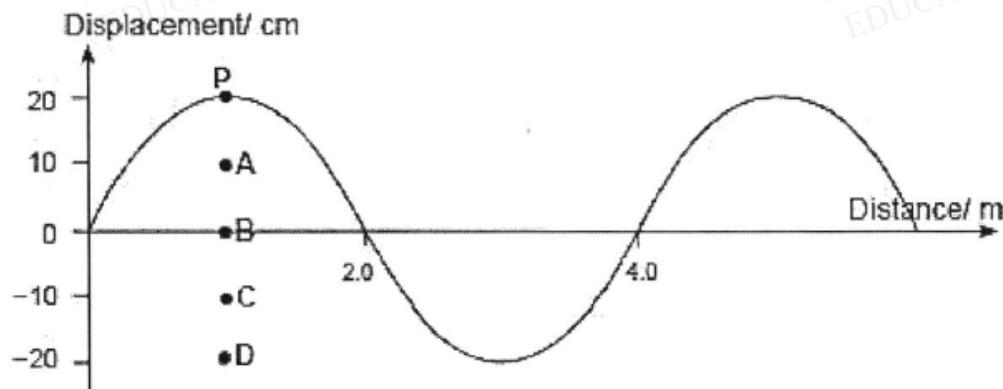


Q7

The graph below shows the relationship between the displacement and the distance travelled by a transverse wave.

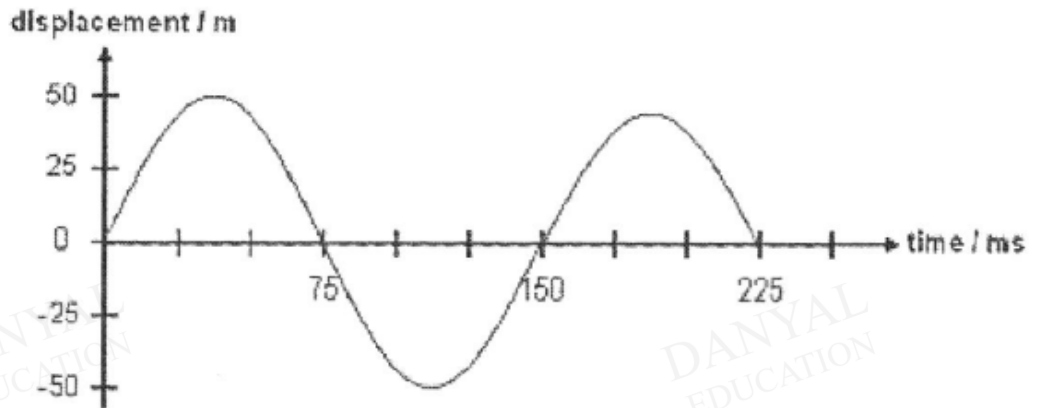
Point P represents the position of a wave particle at time  $t = 0$  s.

If the period of the wave is 0.50 s, what is the new position of P at  $t = 3.25$  s?



Q8

27. The displacement-time graph of a wave's particles is shown below.

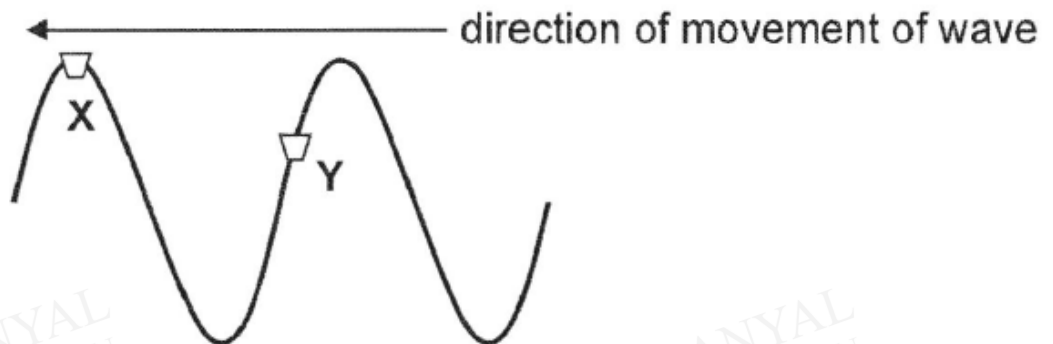


What is the wavelength of the wave if its speed is found to be  $60 \text{ ms}^{-1}$ ?

- A 0.9 m
- B 5.0 m
- C 9.0 m
- D 10.0 m

Q9

The diagram shows two corks, X and Y, floating on water.

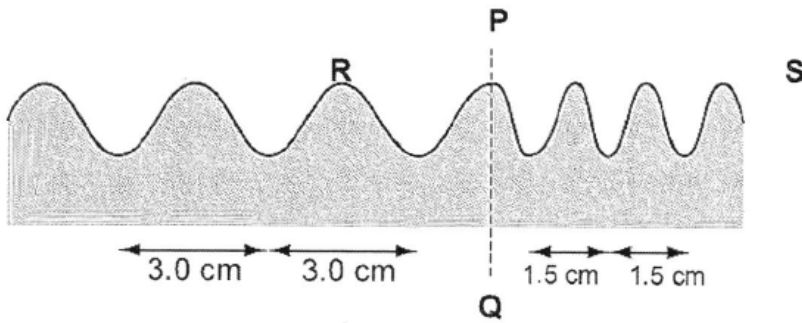


What will happen to both corks as the wave passes?

- A both X and Y will move downwards
- B both X and Y will move upwards
- C X will move upwards and Y will move downwards
- D X will move downwards and Y will move upwards

Q10

The diagram shows a water wave in a ripple tank.



The wave has a speed of  $12 \text{ cm s}^{-1}$  at R.

The wave crosses a boundary PQ where the distance between crests changes from 3.0 cm to 1.5 cm.

What is the speed of the wave at S?

- A 3.0  $\text{cm s}^{-1}$     B 6.0  $\text{cm s}^{-1}$     C 12  $\text{cm s}^{-1}$     D 24  $\text{cm s}^{-1}$

**Answers**

**General Wave Properties Test 2.0**

- Q1 C
- Q2 D
- Q3 D
- Q4 A
- Q5 D
- Q6 A
- Q7 D
- Q8 C
- Q9 D
- Q10 B

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