8.1 Waves: Transverse & Longitudinal

Question Paper

Course	CIE A Level Physics (9702) 2019-2021
Section	8. Waves
Topic	8.1 Waves: Transverse & Longitudinal
Difficulty	Medium

Time allowed: **10**

Score: **/4**

Percentage: **/100**

Question 1

A source of sound of constant power *P* is situated in an open space. The intensity *I* of sound at distance *r* from this source is given by

$$I = \frac{P}{4\pi r^2}$$

How does the amplitude *A* of the vibrating air molecules vary with the distance *r* from the source?

A $A \propto \frac{1}{r}$ **B** $A \propto \frac{1}{r^2}$ **C** $A \propto r$ **D** $A \propto r^2$

[1 mark]

Question 2

A police car siren emits a sound wave with a frequency f_s of 440 Hz. The car is travelling away from an observer at a speed of 30 m s^{-1}.

The speed of sound is 340 m s^{-1}.

Which of the following is the frequency the observer hears?

A 478 Hz

B 460 Hz

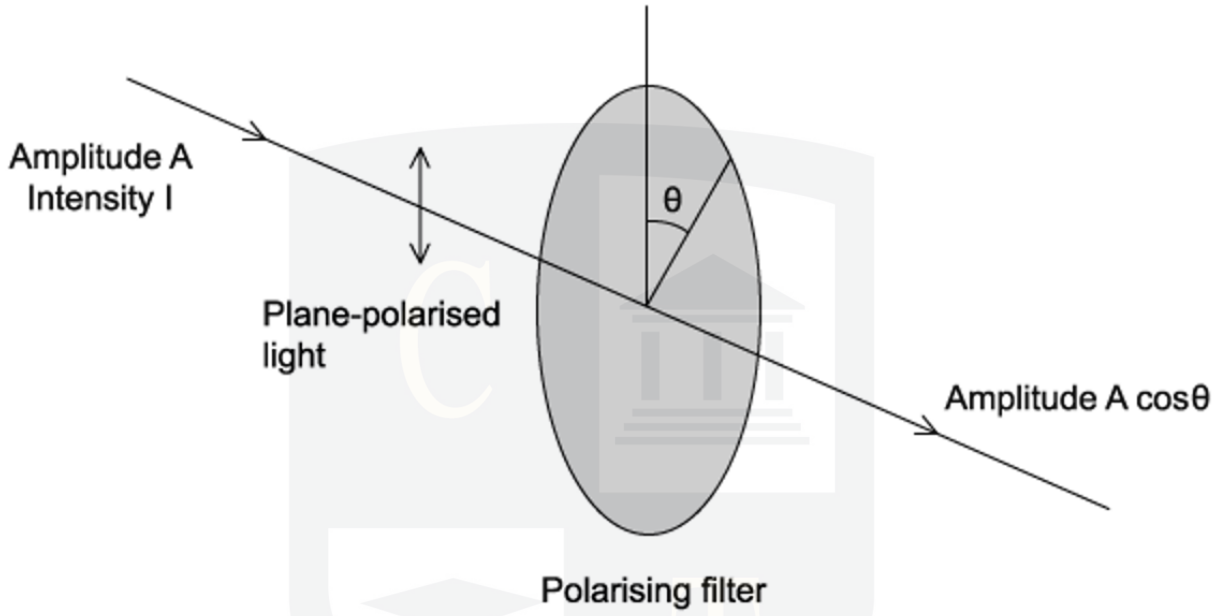
C 440 Hz

D 404 Hz

[1 mark]

Question 3

A plan polarised light of amplitude *A* is passed through a polarising filter as show in the diagram. The emerging light has an amplitude of $A\cos\theta$



If the intensity of the beam is *I*, what is the intensity of the emerging light when *θ* is 60.0˚?

A 0.866 *I*

B 0.750 *I*

C 0.500 *I*

D 0.250 *I*

[1 mark]

Question 4

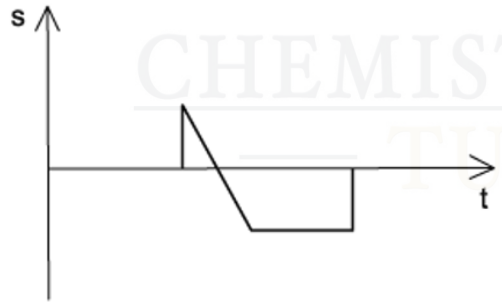
The diagram shows a wave moving along a stretched rope in the direction shown.

Which of the following will be the correct graph to show the variation with time *t* of the displacement *s* of the particle Q in the rope?

A

B

C



D

[1 mark]