

4.4 Wave Behaviour

Question Paper

Course	DP IB Physics
Section	4. Waves
Topic	4.4 Wave Behaviour
Difficulty	Medium

Time allowed: 20
Score: /10
Percentage: /100

Question 1

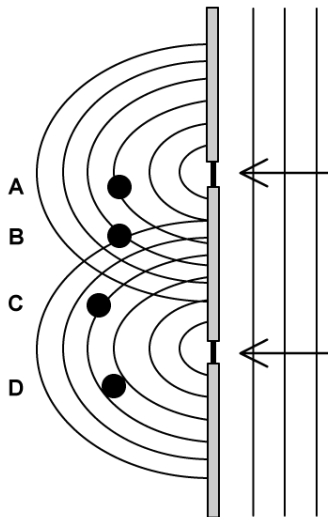
Two waves from individual point sources meet at a point X. Which of the following conditions is necessary for interference to be observed at point X?

- A. Waves of equal amplitude
- B. Waves of equal wavelength
- C. A constant phase difference between the waves
- D. The waves must be electromagnetic

[1 mark]

Question 2

This diagram below shows two apertures through which planar waves are passed as they are moving to the left. The wavefronts show crests moving in phase. Given this information, at which point will the amplitude of the waves be a minimum?



[1 mark]

Question 3

A flat plate made of glass has a refractive index of $n = 1.52$. What is the speed of light within this material?

- A. $1.36 \times 10^8 \text{ m s}^{-1}$
- B. $1.67 \times 10^8 \text{ m s}^{-1}$
- C. $1.97 \times 10^8 \text{ m s}^{-1}$
- D. $2.66 \times 10^8 \text{ m s}^{-1}$

[1 mark]

Question 4

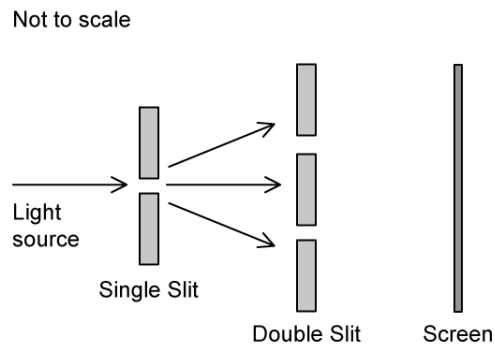
When a light ray enters a denser medium and refracts, some of the characteristics of the wave will change. Which of the following options is correct about this change?

	Speed	Frequency	Wavelength
A	Increases	Decreases	Stays constant
B	Decreases	Stays constant	Decreases
C	Stays constant	Decreases	Increases
D	Increases	Increases	Stays constant

[1 mark]

Question 5

The effect of a double slit on monochromatic light is observed by the set up in the diagram below.



Interference fringes are seen on the screen.

Which of the following changes would increase the distance between the adjacent fringes?

- A. Decrease the width of all the slits
- B. Move the screen closer to the double-slit
- C. Use light of a higher frequency
- D. Decrease the distance between the two slits

[1 mark]

Question 6

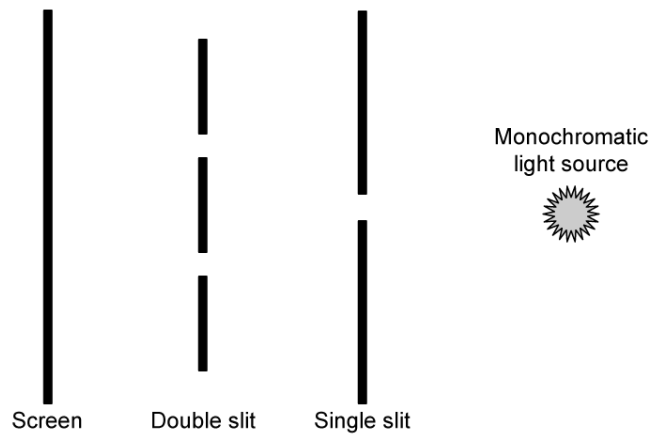
Which of the following options will alter the frequency of a wave?

- A. Reflection
- B. Refraction
- C. Diffraction
- D. None of the above

[1 mark]

Question 7

Young's double-slit experiment is setup as shown, including a monochromatic source, a single slit, a double slit and a screen. What is the purpose of the double slit in this experiment?



- A. To make sure there is equal intensity in the double-slits
- B. To make sure the light is coherent upon the double-slits
- C. To decrease intensity for the double-slits
- D. To reduce the wavelength of the light

[1 mark]

Question 8

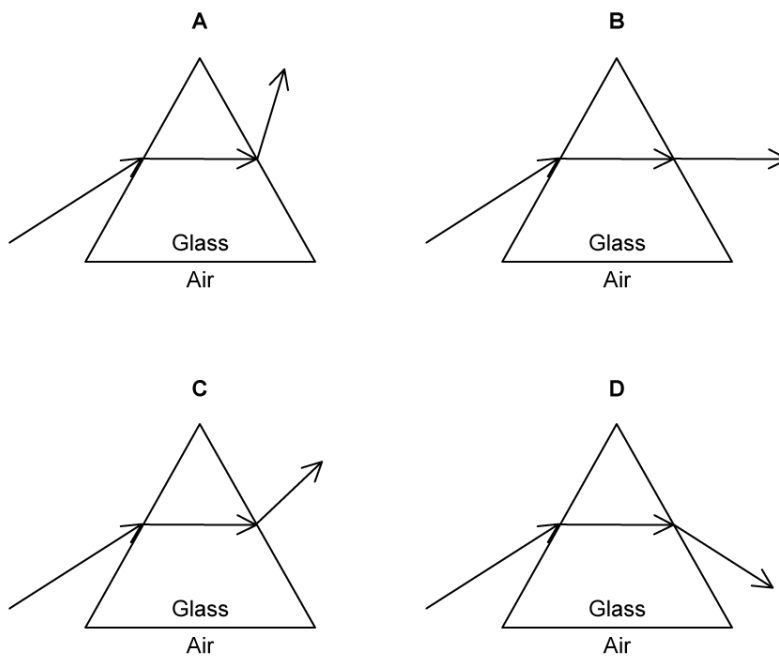
Identical waves that begin propagation at the same time leave from two different sources and arrive at the same point – point X. The first source is 18 m from point X. The second source is 10.5 m from point X. The waves of both sources have a wavelength of 3 m. What is observed at X?

- A. Complete destructive interference
- B. Partial destructive interference
- C. Partial constructive interference
- D. Complete constructive interference

[1 mark]

Question 9

Which of the following images shown below best represents the path of visible light traveling through a glass prism?



[1 mark]

Question 10

The **angle of incidence** should always be measured between:

- A. The normal and the reflected ray
- B. The incident ray and the normal
- C. The incident ray and the reflected ray
- D. The incident ray and the surface of the second medium

[1 mark]