

Waves Multiple Choice Questions (Eduqas A-level Physics)

1. A single slit diffraction experiment is performed with light of wavelength 600 nm. What will happen to the diffraction pattern if the slit is made narrower?
 - A. The central maximum becomes narrower
 - B. The central maximum becomes wider
 - C. There are fewer fringes
 - D. The wavelength of light increases
2. Two waves of frequency 500 Hz and 505 Hz interfere. What is the beat frequency?
 - A. 5.05 Hz
 - B. 5 Hz
 - C. 1005 Hz
 - D. 2.5 Hz
3. In a Young's double slit experiment, the slit separation is 0.25 mm and the screen is 1.5 m away. If the fringe spacing is 3.6 mm, what is the wavelength of the light?
 - A. 400 nm
 - B. 600 nm
 - C. 720 nm
 - D. 900 nm
4. A stationary wave is formed on a string. At the second harmonic, how many nodes are present (including the ends)?
 - A. 1
 - B. 2
 - C. 3
 - D. 4
5. In a ripple tank, two point sources 6 cm apart produce a 3rd order maximum at an angle of 30° to

the central line. What is the wavelength if the screen is 1.5 m away?

- A. 0.5 cm
- B. 1 cm
- C. 2 cm
- D. 3 cm

6. Light travels from air into water ($n = 1.33$). If its wavelength in air is 600 nm, what is its wavelength in water?

- A. 798 nm
- B. 600 nm
- C. 451 nm
- D. 133 nm

7. Light enters a material with a higher refractive index. Which of the following statements is true?

- A. Its speed increases
- B. Its wavelength decreases
- C. Its frequency decreases
- D. It bends away from the normal

8. A wave has a frequency of 5 Hz and a wavelength of 2 m. What is its speed?

- A. 2.5 m/s
- B. 7 m/s
- C. 10 m/s
- D. 0.4 m/s

9. A string supports standing waves. The fundamental frequency is 120 Hz. The 3rd harmonic is measured at 360 Hz and the 5th at 600 Hz. If the length of the string is 1.2 m, what is the wave speed on the string?

- A. 96 m/s
- B. 288 m/s

C. 144 m/s

D. 720 m/s

10. Which of the following is a longitudinal wave?

A. Light

B. Water wave

C. Sound

D. Microwaves

11. In Young's double slit experiment, the fringe spacing increases when:

A. The wavelength decreases

B. The slit separation increases

C. The screen is moved further away

D. The intensity of light increases

12. Two loudspeakers are 4 m apart and emit sound of wavelength 0.8 m in phase. A student walks along a line perpendicular to the midpoint and hears the first minimum at 3 m away. What is the path difference?

A. 0.4 m

B. 0.8 m

C. 1.6 m

D. 2.0 m

13. Two waves of equal frequency and amplitude meet in anti-phase. What is the result of their superposition?

A. Constructive interference

B. Complete destructive interference

C. Increased wavelength

D. A standing wave

14. Which of the following quantities does not change when a wave passes from air into glass?

- A. Speed
- B. Wavelength
- C. Frequency
- D. Direction

15. A wave has a frequency of 50 Hz and a wavelength of 2 m. What is its speed?

- A. 25 m/s
- B. 48 m/s
- C. 100 m/s
- D. 150 m/s

16. The time period of a wave is 0.005 s. What is its frequency?

- A. 50 Hz
- B. 100 Hz
- C. 200 Hz
- D. 2000 Hz

17. A wave travels at 340 m/s. If a stationary observer detects a frequency of 680 Hz, what is the wavelength of the wave?

- A. 0.25 m
- B. 0.5 m
- C. 0.5 m
- D. 2 m

18. The period of a wave is:

- A. The number of waves passing a point each second
- B. The time taken for one complete oscillation
- C. The maximum displacement from equilibrium
- D. The speed of the wave

19. A string of length 0.8 m fixed at both ends vibrates in its third harmonic. If the wave speed on the

string is 120 m/s, what is the frequency?

- A. 150 Hz
- B. 180 Hz
- C. 225 Hz
- D. 360 Hz

20. Two waves are said to be coherent if they:

- A. Have the same amplitude
- B. Are transverse
- C. Have the same frequency and amplitude
- D. Have a constant phase difference

Answer Key

1. B
2. B
3. B
4. C
5. B
6. C
7. B
8. C
9. B
10. C
11. C
12. B
13. B
14. C
15. C
16. D
17. C
18. B
19. C
20. D