

Waves Definitions

Learn them word for word: the highlighted words are the ones the examiner looks for.

1 Frequency	The number of oscillations (or cycles) per second .
2 (Time) period	The time taken for one complete cycle .
3 Wavelength	The distance from one peak to the adjacent peak .
4 Longitudinal wave	A wave whose oscillation is parallel to the direction of energy transfer , with a series of rarefactions (low pressure) and compressions (high pressure).
5 Transverse wave	A wave whose oscillation is perpendicular to the direction of energy transfer .
6 Plane polarisation	The electric field oscillations are in one direction only, perpendicular to the direction of energy transfer . OR: the electric field oscillates in one plane that includes the direction of energy transfer .
7 Amplitude	The maximum displacement from equilibrium .
8 Coherent	Two waves with the same frequency and a constant phase difference .
9 Superposition	When two waves of the same type coincide , the net displacement is the sum of the individual displacements .
10 Constructive interference	Waves coincide in phase , with a path difference of a whole number of wavelengths , so they superpose giving a greater resultant amplitude , called an antinode (brighter / louder / hotter).
11 Destructive interference	Waves coincide in antiphase , with a path difference of an odd number of half wavelengths , so they superpose giving a smaller or zero resultant amplitude , called a node (darker / quieter / colder).
12 Phase	The position in a cycle , expressed as a fraction of 360 degrees or 2π radians .
13 Phase difference	The difference, expressed as an angle , between two points on a wave , or two waves which coincide .
14 Path difference	The difference in length travelled by two waves which coincide .
15 Huygens' construction	Every point on a wavefront should be considered as the source of secondary wavelets . The new wavefront is the envelope of these secondary wavelets.
16 Progressive wave	Net transfer of energy without the medium being transferred .
17 Diffraction	Diffraction is the spreading out of the wave as it passes through a gap or passes around an obstacle .
18 Standing (stationary) wave	No net transfer of energy , with a pattern of nodes and antinodes in fixed positions .
19 Node	Point in a stationary wave at which there is no displacement at any time: destructive interference .
20 Antinode	Point in a stationary wave where the displacement varies by the maximum amount: constructive interference .



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21 Reflection	The change in direction of a wave at an interface between two different media so that the wave returns into the medium from which it originated .
22 Refraction	The change in direction of a wave that occurs when its speed changes due to a change in the density of the medium . The frequency does not change .
23 Total internal reflection	(When light strikes a boundary) the angle of incidence is greater than the critical angle , and all the light is reflected .
24 Critical angle	The angle of incidence where the angle of refraction is 90 degrees . It occurs in the denser medium .
25 Refractive index	The speed of light in a vacuum divided by the speed of light in the medium .
26 Focal point	The point where parallel rays of light will meet , or appear to diverge from , after passing through the lens .
27 Focal length	The distance from the optical centre of the lens to the focal point . It is negative for a diverging (concave) lens and positive for a converging (convex) lens.
28 Principal axis	A line that passes normally (at 90 degrees) through the optical centre of the lens.
29 Real image	A real image can be projected onto a screen and is formed by the actual intersection of rays of light.
30 Virtual image	A virtual image cannot be projected on a screen and is only seen through a lens .
31 Pulse-echo technique	Pulse reflected at the boundary where density changes ; the time for the pulse to return is measured. The distance is calculated as distance = $\frac{1}{2} \times \text{speed} \times \text{time taken}$.
32 Ultrasound	The frequency of sound is ABOVE the human audible range (above 20 kHz).
33 Infrasound	The frequency of sound is BELOW the human audible range (below 20 Hz).



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