

MDCAT Physics Chapter 7 Light Online Test

Sr	Questions	Answers Choice
1	Which of the following is not an advantages of using optical fibres over copper cables?	A. signal attenuation B. number of signals carried per wire C. cost of installation D. none of the above
2	Optical fibres function on the principle of	A. reflection B. refraction C. total internal reflection D. total internal refraction
3	Light of wavelength 800 nm is incident on a pair of slits, forming fringes 4.0 mm apart on a screen. What is the fringe when light of 400 nm is used and the slit separation is halved?	A. 2.0 mm B. 1.0 mm C. 4.0 mm D. 0.5 mm
4	Which electromagnetic wave would cause the most significant diffraction effect for an atomic lattice of spacing around 10^{-10}m ?	A. microwave B. infrared C. ultraviolet D. X-ray
5	Polarisation is a phenomenon associated with a certain type of wave. Which condition must be fulfilled if the wave is to be polarised?	A. It must be a light wave B. It must be a longitudinal wave C. It must be a light wave D. It must be a transverse wave
6	Which of the following atoms cannot be detected by X-ray crystallography?	A. carbon B. nitrogen C. hydrogen D. neon
7	For interference to occur, the light coming from the two slits should	A. be monochromatic B. come from the same source C. have a constant path difference D. all of them
8	X-rays interact with	A. solid crystal B. atoms in the crystal C. nuclei of atoms in the crystal D. electrons of atoms in the crystal
9	How are X-rays diffracted by crystals in X-rays crystallography?	A. they bounce off the nucleus B. they are diffracted when they pass from between them acting as a slit C. they are diffracted by the electron clouds in the atoms D. they hit the side the nucleus and change direction and thus are diffracted
10	X-ray crystallography can be used to get what information about the structure of a compound?	A. the bond angles in a molecules B. the number of molecules per unit cell C. a picture of the electron density in a unit D. all of them
11	When the light from two lamps falls on a screen, no interference pattern can be obtained. Why is this?	A. the light from the lamps is white B. the lamps emit light of different amplitudes C. the light from the lamps is not coherent D. the lamps are not point sources
12	In which situation does diffraction occur?	A. a wave bounces back from a surface B. a wave meets another wave to produce a new wave C. a wave passes from one medium into another D. a wave passes through an aperture

Using monochromatic light, interference fringes are produced on a screen placed a distance D from a pair of slits of separation a .

A. 16 X

13	The separation of the fringes is X. a is now halved and D is increased by a factor of 4. What is the new fringe separation?	B. 8 X C. 4 X D. 2 X
14	Electromagnetic waves from a source were found to be significantly diffracted when passing through gaps of the order of 10 m. What type of waves are they likely to be?	A. gamma waves B. light waves C. microwaves D. radiowaves
15	A two-slit arrangement is set up to produce an interference pattern on a screen. The fringes are too close together for convenient observation. How could the distance between them be increased?	A. by using a light of longer wavelength B. by increasing the width of the slits C. by decreasing the distance between the screen and slits D. the distance between the fringes is impossible
16	With a graded index fibre, the overall time difference between all the wavelengths arrived at the other end may be about	A. 1 ns per km B. 10 ns per km C. 43 s per km D. 33 ns per km
17	With a step-index fibre, the overall time difference between all the wavelengths arrived at the other end may be about	A. 43 s per km B. 33 s per km C. 1 ns per km D. 33 ns per km
18	The information received at the other end of a fibre can be inaccurate due to	A. dispersion of light signal B. spreading of light signal C. both of them D. none of them
19	When light signal travels along fibres, the power losses are mainly due to	A. scattering B. absorption C. both of them D. either of them
20	Light signals in an optical fibre eventually become dim and must be regenerated by devices called	A. transmitters B. receivers C. photodiodes D. none of them