

Name of the Student: _____

Question No. 1 Encircle the correct option.**(20)**

- i. Polarization of light shows that light waves are
 - a. Compression waves
 - b. Transverse waves
 - c. Longitudinal waves
 - d. Matter waves
- ii. The central point of Newton's rings with transmitted light is
 - a. red
 - b. blue
 - c. dark
 - d. bright
- iii. Formation of colorful pattern in a thin film of oil is due to
 - a. Interference
 - b. diffraction
 - c. scattering
 - d. dispersion
- iv. When electromagnetic waves strike the boundary of denser medium they are
 - a. reflected in phase
 - b. reflected out of phase
 - c. absorbed
 - d. refracted
- v. The points of constructive interference of monochromatic light are
 - a. always dark
 - b. always bright
 - c. neither bright nor dark
 - d. both a&b
- vi. In Young's double slit experiment, the fringe spacing is equal to
 - a. $\lambda L / d$
 - b. $d / \lambda L$
 - c. $\lambda d / L$
 - d. $2\lambda L / d$
- vii. The wave nature of light was proposed by
 - a. Thomas Young
 - b. Fresnel
 - c. Maxwell
 - d. Huygens
- viii. Huygen's principle is used to
 - a. explain polarization
 - b. locate new wave front
 - c. find the speed of light
 - d. find refractive index
- ix. The distance between two consecutive dark fringes is called
 - a. wave length
 - b. fringe spacing
 - c. wavelet
 - d. amplitude
- x. The fringe spacing in a double slit experiment can be increased by decreasing
 - a. wavelength of light
 - b. width of slits
 - c. slit separation
 - d. distance b/w slit and screen
- xi. Oscillating charges produce
 - a. Mechanical waves
 - b. electromagnetic waves
 - c. matter waves
 - d. longitudinal waves
- xii. The angle of 180° is equivalent to a path difference of
 - a. λ
 - b. $\lambda/2$
 - c. $\lambda/4$
 - d. 2λ
- xiii. The polarization of light can be achieved by the process of
 - a. selective absorption
 - b. reflection
 - c. refraction
 - d. all of these
- xiv. When sunlight passes through atmosphere, its energy reduces due to
 - a. reflection of dust particles
 - b. scattering by dust particles
 - c. absorption by dust particles
 - d. all of these
- xv. If mirror M_1 in Michelson Interferometer is moved by a distance of $\lambda/4$, then path difference is
 - a. 2λ
 - b. λ
 - c. $\lambda/2$
 - d. $\lambda/4$
- xvi. A line normal to wave front indicating the direction of motion is called
 - a. wave
 - b. ray
 - c. pulse
 - d. none of these
- xvii. The condition for constructive interference of two coherent beams is that the path difference should be
 - a. odd integral multiple of $\lambda/2$
 - b. integral multiple of λ
 - c. integral multiple of $\lambda/2$
 - d. integral multiple of $\lambda/4$
- xviii. The distance between two bright fringes ----- distance between two consecutive dark fringes
 - a. is greater than
 - b. is equal to
 - c. is less than
 - d. has no comparison
- xix. The appearance of colors in the bubble of soap when sun light falls on it, is due to
 - a. diffraction
 - b. polarization
 - c. interference
 - d. dispersion
- xx. Bending of light around sharp obstacles is called
 - a. diffraction
 - b. polarization
 - c. interference
 - d. dispersion

Question No. 2 Write short answers.**2x6=12**

- i. Under what conditions two or more sources of light behave as coherent sources?
- ii. Can visible light produce interference fringes? Explain.
- iii. Explain whether the Young's experiment is an experiment for studying interference or diffraction effects of light?
- iv. An oil film spreading over a wet footpath shows colors. Explain how does it happen?
- v. How would you manage to get more orders of spectra using a diffraction grating?
- vi. Why the Polaroid sunglasses are better than ordinary sunglasses?
- vii. Define fringe spacing? On which factors it depend?
- viii. Define polarization of light.

Q. No. 3 a. Describe in detail the interference pattern formed on the screen due to Young's double slit. **(5)**

b. Yellow sodium light of wavelength 589 nm, emitted by a single source passes through two narrow slits 1 mm apart. The interference pattern is observed on a screen 225 cm away. How far apart are two adjacent bright fringes? **(3)**

OR**Q.No. 4 a.** Explain the x-ray diffraction from nickel crystal. Also calculate Bragg's formula for path difference. **(5)**

b. In a double slit experiment the second order maximum occurs at 0.25° . The wavelength is 650 nm. Determine the slit separation. **(3)**