Time : 2 hr.   **M.M. : 40**

1. Draw a diagram to show cylindrical wavefront. [1]
2. A light wave enters from air to glass. How will the following be affected: [1]
   (i) Energy of the wave
   (ii) Frequency of the wave:
3. What is the shape of the wavefront when light is diverging from a point source? [1]
4. State the conditions that must be satisfied for two light sources to be coherent. [1]
5. In young's double slit experiment. The distance between the slits is halved, what change in the fringe width will take place? [1]
6. Obtain an expression for the ratio of intensities at maxima and minima in an interference pattern. [2]
7. A slit S is illuminated by a monochromatic source of light to give two coherent sources P_1 and P_2. These give bright and dark bands on a screen. At a point R on the screen there is a dark fringe. What relation must exist between the lengths P_1R and P_2R? [2]
8. State Brewster law? Using this law prove that, at the polarizing angle of incidence, the reflected and transmitted rays are perpendicular to each other? [3]
9. In a single slit experiment, how is the angular width of central bright fringe maximum changed when [3]
   (i) The slit width increased
   (ii) The distance between the slit and the screen is increased.
   (iii) Light of smaller wavelength is used.
10. (a) State Huygens's principle for constructing wavefronts. [3]
    (b) Using Huygens's principle deduce the laws of reflection of light. [4]
    (c) What changes in diffraction pattern of a single slit will you observe when the monochromatic source of light is replaced by a source of white light? [2]
11. In young's double slit experiment how is the fringe width change if:
    (i) Light of smaller frequency is used
    (ii) Distance between the slits is decreased [2]
12. Write two points of difference between interference and diffraction. [2]
13. Two coherent sources whose intensity ratio is 81:1 produce interference fringes. Calculate the ratio of intensity of maxima and minima in the interference pattern. [2]
14. Using Huygens's principle deduce the laws of refraction? [4]
15. (a) Coloured spectrum is seen, when we look through a muslin cloth. Why? [1]
    (b) What changes in diffraction pattern of a single slit will you observe when the monochromatic source of light is replaced by a source of white light? [2]
16. A slit of width 'a' is illuminated by light of wavelength 6000 A^O. For what value of 'a' will the :-
    (i) First maximum fall at an angle of diffraction of 30°?
    (ii) First minimum fall at an angle of diffraction 30°? [3]