# DPP
DAILY PRACTICE PROBLEMS

**Class : XIIth** **Subject : PHYSICS**
**Date :** **DPP No. : 7**

## Topic :-WAVE OPTICS

1. Light of wavelength $500nm$ is used to form interference pattern in Young's double slit experiment. A uniform glass plate of refractive index 1.5 and thickness $0.1nm$ is introduced in the path of one of the interfering beams. The number of fringes which will shift the cross wire due to this is
   a) 100 b) 200 c) 300 d) 400
2. If white light is used in the Newton's rings experiment, the colour observed in the reflected light is complementary to that observed in the transmitted light is complementary to that observed in the transmitted light through the same point. This is due to
   a) 90° change of phase in one of the reflected waves
   b) 180° change of phase in one of the reflected waves
   c) 145° change of phase in one of the reflected waves
   d) 45° change of phase in one of the reflected waves
3. A beam of light of wavelength 600 nm from a distance source falls on a single slit 1.00 mm wide and the resulting diffraction pattern is observed on a screen 2m away. The distance between the first dark fringes on either side of the central bright fringe is
   a) 1.2 cm b) 1.2 mm c) 2.4 cm d) 2.4 mm
4. Air has refractive index 1.003, the thickness of air column, which will have one more wave length of yellow light (6000 Å) than in the same thickness of vacuum is
   a) 2 mm b) 2 cm c) 2 m d) 2 km
5. Two stars are situated at a distance of 8 light year from the earth. These are to be just resolved by a telescope of diameter 0.25 m. If the wavelength of light used is 5000Å, then the distance between the stars must be
   a) $3 \times 10^{10}$ m b) $3.35 \times 10^{11}$ m c) $1.95 \times 10^{11}$ m d) $4.32 \times 10^{10}$ m
6. Electromagnetic waves travel in a medium which has relative permeability 1.3 and relative permittivity 2.14. Then the speed of the electromagnetic wave in the medium will be
   a) $13.6 \times 10^{6}\ m/s$ b) $1.8 \times 10^{2}\ m/s$ c) $3.6 \times 10^{8}\ m/s$ d) $1.8 \times 10^{8}\ m/s$
7. In Fresnel's biprism experiment, on increasing the prism angle, fringe width will
   a) Increase b) Decrease
   c) Remain unchanged d) Depend on the position of object
8. A slit 5 cm wide is irradiated normally with microwaves of wavelength 1.0 cm. Then the angular spread of the central maximum on either side if incident light is nearly
   a) 1/5 rad b) 4 rad c) 5 rad d) 6 rad

9. Which of the following phenomena can explain quantum nature of light
   a) Photoelectric effect b) Interference c) Diffraction d) Polarization
10. Two slits, 4 mm apart are illuminated by light of wavelength600 Å. What will be the fringe width on a screen placed 2 m from the slits?
   a) 0.12 mm b) 0.3 mm c) 3.0 mm d) 4.0 mm
11. Consider the following statements in case of Young's double slit experiment.
   . A slit $S$is necessary if we use an ordinary extended source of light.
   I. A slit $S$is not needed if we use an ordinary but well collimated beam of light.
   II. A slit $S$is not needed if we use a spetially coherent source of light.
   Which of the above statement are correct?
   a) (i)And (iii) b) (ii) and (iii) c) (i)and (ii) d) (i), (b) and (iii)
12. For skywave propagation of a 10 $MHz$ signal, what should be the maximum electron density in ionosphere
   a) $\sim 1.2 \times 10^{12} m^{-3}$ b) $\sim 10^{6} m^{-3}$ c) $\sim 10^{14} m^{-3}$ d) $\sim 10^{22} m^{-3}$
13. In a Young's double slit experiment the intensity at a point where the path difference is $\frac{\lambda}{6}$($\lambda$ being the wavelength of the light used) is $I$. If $I_0$ denotes the maximum intensity, $I/I_0$ is equal to
   a) $\frac{1}{\sqrt{2}}$ b) $\frac{\sqrt{3}}{2}$ c) $\frac{1}{2}$ d) $\frac{3}{4}$
14. Two sources of waves are called coherent if
   a) Both have the same amplitude of vibrations
   b) Both produce waves of the same wavelength
   c) Both produce waves of the same wavelength having constant phase difference
   d) Both produce waves having the same velocity
15. A beam of light of wavelength 600 nm from a distant source falls on a single slit 1 mm wide and the resulting diffraction pattern is observed on a screen 2 m away. The distance between the first dark fringes on either side of the central bright fringe is
   a) 1.2 cm b) 1.2 mm c) 2.4 cm d) 2.4 mm
16. $n$th Bright fringe if red light $(\lambda_1 = 7500\ \text{Å})$ coincides with $(n+1)^{th}$ bright fringe of green light $(\lambda_2 = 6000\ \text{Å})$. The value of $n = ?$
   a) 4 b) 5 c) 3 d) 2
17. Which of the following statements is true, when spherical waves fall on a plane refracting surface, separating two media
   a) The reflected waves form spherical wave fronts
   b) The reflected waves form plane wave fronts
   c) The refracted waves form plane wave fronts
   d) There are no refracted waves
18. Brewster's angle in terms of refractive index $(n)$ of the medium
   a) $\tan^{-1}[\sqrt{n}]$ b) $\sin^{-1}[n]$ c) $\sin^{-1}[\sqrt{n}]$ d) $\tan^{-1}[n]$
19. In double slit experiment, for light of which colour the fringe width will be minimum
   a) Violet b) Red c) Green d) Yellow

20. If a white light is used in Young's double slit experiments then a very large number of coloured fringes can be seen
    a) With first order violet fringes being closer to the central white fringes
    b) First order red fringes being closer to the central white fringes
    c) With a central white fringe
    d) With a central black fringe