

DPP 01

- Q.1** 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
- Q.2** In a wave, the path difference corresponding to a phase difference of ϕ is
 (A) $\frac{\pi}{2\lambda} \phi$ (B) $\frac{\pi}{\lambda} \phi$ (C) $\frac{\lambda}{2\pi} \phi$ (D) $\frac{\lambda}{\pi} \phi$
- Q.3** Two coherent sources of intensities, I_1 and I_2 produce an interference pattern. The maximum intensity in the interference pattern will be
 (A) $I_1 + I_2$ (B) $I_1^2 + I_2^2$ (C) $(I_1 + I_2)^2$ (D) $(\sqrt{I_1} + \sqrt{I_2})^2$
- Q.4** If two light waves having same frequency have intensity ratio 4: 1 and they interfere, the ratio of maximum to minimum intensity in the pattern will be
 (A) 9: 1 (B) 3: 1 (C) 25: 9 (D) 16: 25
- Q.5** If the ratio of amplitude of two waves is 4: 3, then the ratio of maximum and minimum intensity is
 (A) 16: 18 (B) 18: 16 (C) 49: 1 (D) 94: 1
- Q.6** Four light waves are represented by
 (i) $y = a_1 \sin \omega t$ (ii) $y = a_2 \sin (\omega t + \phi)$
 (iii) $y = a_1 \sin 2\omega t$ (iv) $y = a_2 \sin 2(\omega t + \phi)$
 Interference fringes may be observed due to superposition of
 (A) (i) and (ii) (B) (i) and (iii) (C) (ii) and (iii) (D) (ii) and (iv)
- Q.7** The intensity ratio of two coherent sources of light is p . They are interfering in some region and produce interference pattern. Then the fringe visibility is
 (A) $\frac{1+p}{2\sqrt{p}}$ (B) $\frac{2\sqrt{p}}{1+p}$ (C) $\frac{p}{1+p}$ (D) $\frac{2p}{1+p}$
- Q.8** In a Young's double slit experiment, 16 fringes are observed in a certain segment of the screen when light of wavelength 700 nm is used. If the wavelength of light is changed to 400 nm, the number of fringes observed in the same segment of the screen would be
 (A) 24 (B) 28 (C) 30 (D) 18

(Physics)

WAVE OPTICS

- Q.9** In a Young's double slit experiment, light of 500 nm is used to produce an interference pattern. When the distance between the slits is 0.05 mm, the angular width (in degree) of the fringes formed on the distance screen is close to
- (A) 0.17° (B) 0.57° (C) 1.7° (D) 0.07°
- Q.10** In an interference experiment the ratio of amplitudes of coherent waves is $\frac{a_1}{a_2} = \frac{1}{3}$. The ratio of maximum and minimum intensities of fringes will be
- (A) 4 (B) 9 (C) 2 (D) 18



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ANSWER KEY

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|----|-----|----|-----|-----|-----|----|-----|----|-----|----|-----|----|-----|
| 1. | (C) | 2. | (C) | 3. | (D) | 4. | (A) | 5. | (C) | 6. | (A) | 7. | (B) |
| 8. | (B) | 9. | (B) | 10. | (A) | | | | | | | | |

