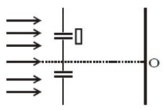
Wave Optics

1. **Assertion (A):** When a width of one of the slits of Young's double slit experiment is double that of the other than brighter frings are nine times brighter than the dark fringes.
Reason (R): The amplitude of the wave is proportional to the width of the slit.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

2. **Assertion (A):** When tiny circular obstacle is placed in the path of light from some distance, a bright spot is seen at the centre of shadow of the obstacle.
Reason (R): Constructive interference occurs at the centre of the shadow.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

3. **Assertion (A):** In the figure shown zero order maxima will be above point "O".

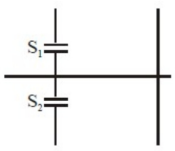


Reason (R): Zero order maxima means a point where the path difference is zero.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

4. **Assertion (A):** If width of one of the slit in YDSE is slightly increased, then maximum and minimum both Intensity will increase.
Reason (R): Intensity reaching from that slit on screen will slightly increase.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

5. **Assertion (A):** If white light is used in place of monochromatic light in YDSE then central point is white. Although at other places coloured fringes will be obtained.
Reason (R): At centre path difference is zero for all wave lengths. Hence all wave will interfere constructively.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

6. **Assertion (A):** White light is used in YDSE now a glass slab is inserted infront of the slit, then red fringe will shift less (in upward direction) compared to violet.



Reason (R): Refractive index of violet colour will be more
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

7. **Assertion (A):** Distance between two coherent sources S_1 and S_2 is 4λ. A large circle is drawn around these sources with centre of circle lying on centre of S_1 and S_2. there are total 16 maxima on the circle.
Reason (R): Total number of minima on this circle are less compare to total number of maximas.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

8. **Assertion (A):** As the separation between the two slits is increased width of fringes decreases.
Reason (R): On increasing separation between two slits, angular separation of fringes decreases.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

9. **Assertion (A):** In case of young double slit experiment width of all fringes were equal.
Reason (R): Angular width of fringes were equal.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

10. **Assertion (A):** In case of single slit diffraction intensity of higher order maxima decreases.
Reason (R): Higher order maxima are at larger distance.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

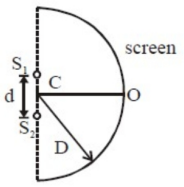
11. **Assertion (A):** If black strips of width w are separated by white strips of width d (d < w) are just distinguishable from a distance D. Then resolving power of eye will be higher for smaller d.
Reason (R): Resolution of eye is d/D and resolving power inversely proportional to resolution.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

12. **Assertion (A):** If light incident on surface of two different media. The refracted beam may be partially polarized.
Reason (R): If sum of angle of incidence and angle of refraction is $\pi/2$ then a reflected light is totally polarised.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

13. **Assertion (A):** On increasing wavelength of light used, resolving power increases.
Reason (R): On increasing wavelength, width of central maxima decreases.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

14. **Assertion (A):** If three polarisers are arranged such that the axis of any two successive polarisers make equal angle with each other. If unpolarised light of intensity I_0 incident on first polariser then intensity of emergent light after 3rd polariser is $\frac{I_0}{8}$. If angle between them is 45°.
Reason (R): Each time intensity becomes 50% by Malus law.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

15. **Assertion (A):** If in YDSE $\frac{d}{\lambda}$ =200 and screen is semicylinderical as shown. Axis of semicylinder is passing through mid point between slits.



then number of bright fringes are 200.
Reason (R): Maximum path difference is $n\lambda = d$ between lowest and highest position and $n = \frac{d}{\lambda} = 200$.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

16. **Assertion (A):** If in YDSE, wavelength of light used is increased, angular width remain unchanged only linear width of fringes increases.
Reason (R): Only linear fringe width proportional to wavelength and angular fringe width does not depends on wavelength.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

17. **Assertion (A):** As angle subtended by the diameter of objective lens at the focus of microscope increased, resolving limit also increases.
Reason (R): Resolving limit proportional to tangent of the angle subtended by the diameter of objective lens at the focus of microscope.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

18. **Assertion (A):** When refractive index of medium is increased resolving power also increases.
Reason (R): In medium of higher refractive index wavelength is higher
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

19. **Assertion (A):** The resolving power of a telescope is more if the diameter of the objective in more.
Reason (R): Objective lens of larger focal length collect more light.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

20. **Assertion (A):** In single slit diffraction arrangement, instead of keeping the screen far away, often a converging lens is placed after the slit and a screen is placed at its focus.
Reason (R): Lens doesn't introduce any extra path difference for a parallel beam.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

21. **Assertion (A):** The stars which are not resolved in the image produced by the objective of a telescope can't be further resolved by its eye piece.
Reason (R): The primary purpose of eyepiece of telescope is to provide the magnification of image produced by the objective.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

22. **Assertion (A):** When a monochromatic light beam is incident normally on a reflective surface, under some condition it is possible that all lights is transmitted without any reflection.
Reason (R): When light after passing through a polaroid is incident on a reflecting surface at angle of incidence equals to polarizing angle, then all light gets transmitted without any reflection.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

23. **Assertion (A):** Two persons separated by a 7m partition wall in a room of 10 m high can heard each other easily but cannot see each other.
Reason (R): Any sound wave can bend by the obstacle while light can't.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

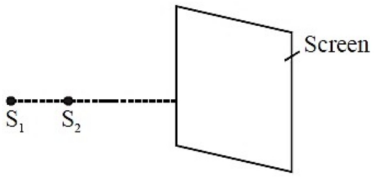
24. **Assertion (A):** The fringe pattern in Young's double slit experiment is result of both phenomena of interference and diffraction.
Reason (R): Diffraction results from superposition of wavelets of same wavefront.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

25. **Assertion (A):** Wave nature can be proved by phenomena of interference and diffraction.
Reason (R): Only transverse wave can show the phenomena of polarization.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

26. **Assertion (A):** Huygens's principle can explain converging nature of convex lens.
Reason (R): Snell's law can be derived from Huygens's principle.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

27. **Assertion (A):** In a YDSE, the two slits are at distance 'a' apart. Interference pattern is observed on a screen at a distance D from the slits. At a point on the screen which is directly opposite to the slit, a dark fringe is observed. Then the wavelength of wave is proportional to square of distance between slits.
Reason (R): The light ray coming from two slits do not interfere at the screen.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

28.



S_1 and S_2 are two pinhole coherent point sources and screen is perpendicular to line joining source.

Assertion (A): Shape of a fringe on screen is circular.

Reason (R): Fringe is locus of all points having common path difference.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

29. **Assertion (A):** In a Young's double slit experiment if slit separation is slightly greater than nl if n is integer No. of maxima on screen is 2n + 1 & no of minima is 2n.

Reason (R): In Young's double slit experiment path difference at different position are different.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

30. **Assertion (A):** In standard YDSE experiment if upper slit is slightly moved downward then central maxima shifts downward.

Reason (R): Fringe width in such case will increase.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

31. **Assertion (A):** If the phase difference between the light waves emerging from the slits of the Young's experiment is π radian, then central fringe will be dark.

Reason (R): Phase difference is equal to $\frac{2\pi}{\lambda}$ times the effective path difference.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

32. **Assertion (A):** In YDSE central maxima means the maxima formed with zero optical path difference. It may be formed anywhere on the screen.

Reason (R): In an interference pattern, whatever energy disappears at the minimum, appears at the maximum.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

33. **Assertion (A):** Diffraction takes place for all types of waves mechanical or non-mechanical, transverse or longitudinal.

Reason (R): Diffraction's effects are perceptible only if wavelength of wave is comparable to dimensions of diffracting device.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

34. **Assertion (A):** Light is diffracted around the edges of obstacles and it bend such a way which is not easily observed.
Reason (R): The wavelength of light is very small.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

35. **Assertion (A):** In Young's double slit experiment if intensity of each source is I_0 then minimum and maximum intensity is zero and $4I_0$ respectively.
Reason (R): In Young's double slit experiment energy conservation is not followed.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

36. **Assertion (A):** Radio waves cannot be diffracted by the buildings.
Reason (R): The wavelength of radio waves is very small.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

37. **Assertion (A):** In standard YDSE set up with visible light, the position on screen where phase difference is zero appears bright.
Reason (R): In YDSE set up amplitude of electromagnetic field at central bright fringe is not varying with time.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

38. **Assertion (A):** In Young's experiment, the fringe width for dark fringes is different from that for bright fringes.
Reason (R): In Young's double slit experiment with a source of white light, only black and white fringes are observed.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

39. **Assertion (A):** The plane of polarization of reflected ray is parallel to the refracting surface, when light is incident at polarising angle.
Reason (R): Vibration of electric field in refracted ray ceases about plane parallel to refracting surface.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

40. **Assertion (A):** Diffraction is common in sound but not common in light waves.
Reason (R): Wavelength of light wave is more than the wavelength of sound.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

41. **Assertion (A):** If a glass slab is placed in front of one of the slits, then fringe width will decrease.
Reason (R): Glass slab will produce no path difference.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

42. **Assertion (A):** If incident wavefront is plane, then after reflection or refraction the emerging wave front also must be plane.
Reason (R): Wavefronts are in the direction of energy propagation by light.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

43. **Assertion (A):** If two sodium lamps are used illuminating two pinholes, interference fringes will not be observed.
Reason (R): Light waves coming from an ordinary source like sodium lamp are unpolarised in nature.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

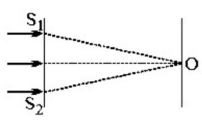
44. **Assertion (A):** In a Young's double slit experiment (YDSE), if the screen is move away from the plane of slits, Angular fringe width remains unchanged.
Reason (R): Linear and Angular fringe width is directly proportional to D.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

45. **Assertion (A):** In case of YDSE, if monochromatic light is replaced by white light then closest on either side of central white fringe will be blue and farthest will appear red.
Reason (R): Fringe width for blue will be greater than that for red for same bright fringe.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

46. **Assertion (A):** In everyday life, we do not encounter diffraction of light in contrast to that for sound.
Reason (R): Diffraction characteristic is not exhibited by all kind of waves.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

47. **Assertion (A):** In the double slit experiment, if one of the slit is closed, no fringe pattern will be observed on the screen.
Reason (R): In interference, phenomenon of diffraction is also included.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

48. **Assertion (A):** Incoherent sources do not produce an interference pattern.
Reason (R): Light from two coherent sources that are not in phase does not produce an interference pattern.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

49. 

Assertion (A): In YDSE, as shown in figure, central bright fringe is formed at O. If path difference at O increases y-coordinate of central bright fringe will change.
Reason (R): In YDSE, as shown in figure, central bright fringe is formed at O. If a liquid is filled between plane of slits and screen, the central bright fringe is shifted in upward direction.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

50. **Assertion (A):** Light is a wave phenomenon.
Reason (R): Light requires a material medium for its propagation.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

51. **Assertion (A):** Two sources of light emit light waves of same frequency but of different amplitudes. Also the phase difference between light waves from the two sources at any point is time independent. Therefore, observable interference will be obtained when light waves from the two sources superimpose.
Reason (R): The sources are not coherent due to unequal amplitudes.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

52. **Assertion (A):** Interference pattern is obtained on a screen due to two identical coherent sources of monochromatic light. The intensity at the central part of the screen becomes one-fourth if one of the sources is blocked.
Reason (R): The resultant intensity at any point is the algebraic sum of the intensities due to two sources.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

53. **Assertion (A):** Energy is created during constructive interference and destroyed during destructive interference.
Reason (R): The positions of constructive interference are sources of energy while the positions of destructive interference are sinks of energy.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

54. **Assertion (A):** In Young's double slit experiment, assuming slits to be of equal widths, intensity at interference maxima is four times the intensity due to each slit.
Reason (R): Intensity is proportional to the square of amplitude.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

55. **Assertion (A):** If Young's double slit experiment is performed with white light, the bright fringes produced are white and the dark fringes black.
Reason (R): In case of interference, there is no colour splitting.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

56. **Assertion (A):** In Young's double slit experiment, if one of the slits is closed, intensity at the position of central fringe becomes half.
Reason (R): Resultant intensity, being sum of intensities from individual slits, becomes half as one slit is closed.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

57. **Assertion (A):** In YDSE, fringes with blue light are thicker than those for red light.
Reason (R): In YDSE, the n^{th} maxima always comes before the n^{th} minima.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

58. **Assertion (A):** The best contrast of the interference pattern is obtained when the intensity of the emerging lights from the two slits of the Young's experimental set-up are equal.
Reason (R): Intensity is proportional to the square of the amplitude.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

59. **Assertion (A):** The central fringe is bright or dark, it dependents on the initial phase difference between the two coherent sources.
Reason (R): The pattern and position of fringes always remains same even after the introduction of transparent medium in a path of one of the slit.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

60. **Assertion (A):** Diffraction is a sure indication of wave nature.
Reason (R): Only transverse waves can be diffracted.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

61. **Assertion (A):** We cannot get diffraction pattern from a wide slit illuminated by monochromatic light.
Reason (R): In diffraction pattern, all the bright bands are not of the same intensity.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

62. **Assertion (A):** Diffraction of light is due to dispersion.
Reason (R): Change in path of light around "the corners separates the wavelength of various colours.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

63. **Assertion (A):** Sound waves in air cannot be polarised.
Reason (R): Polarisation is the characteristic of light wave only.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

64. **Assertion (A):** Two polaroids are crossed to each other. When either of them is rotated through 30°, then only one eighth of the incident unpolarised light passes through the combination.
Reason (R): According to Malus's law, $I \propto \cos^2 \theta$ where **I** is the resultant intensity transmitted and θ is the angle between the optical axis of analyser and polariser.
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

65. **Assertion (A):** At the first glance the top surface of a Morpho's butterfly's wing appears a beautiful blue-green. If the wing moves, the colour changes.
Reason (R): Different pigments in the wing reflect light at different angles.
[Hint: It is due to interference of light rays reflected from different layers of wing.]
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

ANSWER KEY																				
Que.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Ans.	4	1	1	1	1	1	3	2	2	2	1	2	4	1	4	4	4	3	3	2
Que.	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
Ans.	2	3	3	2	2	2	3	4	2	2	2	2	2	2	3	4	2	4	3	4
Que.	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
Ans.	4	4	2	3	4	3	2	3	3	3	3	3	3	2	2	4	4	2	3	3
Que.	**61**	**62**	**63**	**64**	**65**															
Ans.	2	4	3	1	3															