Assignment 1 Chapter 9 Subject: Physics Class: First year Total Marks: 60
Name _____

Question No. 1. Encircle the correct option

1. Polarization of light shows that light waves are
   a. Compression waves b. Transverse waves c. Longitudinal waves d. Matter waves
2. The central point of Newton's rings with transmitted light is
   a. red b. blue c. dark d. bright
3. Formation of colorful pattern in a thin film of oil is due to
   a. Interference b. diffraction c. scattering d. dispersion
4. When electromagnetic waves strike the boundary of denser medium they are
   a. reflected in phase b. reflected out of phase c. absorbed d. refracted
5. The points of constructive interference of monochromatic light are
   a. always dark b. always bright c. neither bright nor dark d. both a&b
6. 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. $2\lambda L / d$
7. The wave nature of light was proposed by
   a. Thomas Young b. Fresnel c. Maxwell d. Huygens
8. Huygen's principle is used to
   a. explain polarization b. locate new wave front c. find the speed of light d. find refractive index
9. The distance between two consecutive dark fringes is called
   a. wave length b. fringe spacing c. wavelet d. amplitude
10. 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
11. Oscillating charges produces
    a. Mechanical waves b. electromagnetic waves c. matte waves d. longitudinal waves
12. The angle of 180^o is equivalent to a path difference of
    a. λ b. $\lambda/2$ c. $\lambda/4$ d. 2λ
13. The polarization of light can be achieved by the process of
    a. selective absorption b. reflection c. refraction d. all of these
14. 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
15. 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. $\lambda/4$
16. A line normal to wave front indicating the direction of motion is called
    a. wave b. ray c. pulse d. none of these
17. 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 $\lambda/4$
18. 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
19. 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
20. Bending of light around sharp obstacles is called
    a. diffraction b. polarization c. interference d. dispersion
21. The distance b/w two consecutive wave fronts is called
    a. time period b. frequency c. wavelength d. displacement
22. Newton's rings are formed due to
    a. diffraction b. interference c. polarization d. refraction
23. The wave nature of light was proposed by
    a. Thomas Young b. Fresnel c. Maxwell d. Huygens
24. Phase angle of 180^o is equivalent of a path difference of
    a. $\lambda/2$ b. $\lambda/4$ c. 2λ d. $3\lambda/2$
25. 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
26. The polaroid sun glasses are better than ordinary sun glasses because they
    a. increase intensity of light b. decrease intensity of light c. do not change intensity of light d. none
27. Michelson's interferometer can be used to measure
    a. amplitude of light b. wavelength of light c. speed of light d. intensity of light
28. One angstrom is equal to
    a. 10^{-10} m b. 10^{-9} m c. 10^{-12}m d. 10^{-15}m
29. 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. $\lambda/4$
30. If N is number of lines per meter in grating of length L, its grating element is given by
    a. N/L b. L/N c. L/2N d. 2N/L
31. Confinement of light into one plane of vibration is called
    a. diffraction b. polarization c. interference d. dispersion

32. When one mirror of a Michelson interferometer is move a distance of 05 mm, 2000 fringes are observed, the wavelength of light used is
a. 2000 A^o b. 5000 A^o c. 1000 cm d. none of these

33. The blue color of sky is due to
a. diffraction b. interference c. polarization d. scattering

34. The effective path difference b/w two reflected beams in x-ray diffraction by nickel crystal is
a. $d\sin\theta$ b. $2d\sin\theta$ c. $d/2\ \sin\theta$ d. $d\sin(\theta/2)$

35. Oscillating charges produces
a. mechanical waves b. electromagnetic waves c. matter waves d. longitudinal waves

36. Light reaches from the sun to the earth in the form of
a. spherical wave front b. plane wave front c. circular wave front d. cylindrical wave front

37. One angstrom is equal to
a. 10^{-9} b. 10^{-10} c. 10^{-8} d. 10^{-11}

38. The velocity of light was determined accurately by:
(a) Newton (b) Michelson (c) Huygen (d) Young

39. In case of point source the shape of wave front is
(a) circular (b) spherical (c) elliptical (d) square

40. The phenomena of interference of light is a
a) wave characteristics b) Particle characteristic c) Both wave and particle characteristic d) None

41. Huygen's principle is used to determine the
a) Interference of wave fronts b) Nature of light
c) Shape and location of new wave front d) Speed of light

42. An oil film floating on water surface exhibits beautiful colors due to
a) Diffraction b) Polarization c) Interference d) None

43. Light waves produce interference when they are
a) Monochromatic b) Coherent c) Sources are close together d) All of these

44. Two wave traveling in the same direction interfere destructively if their path difference is
a) $m\lambda$ b) $(m + ½)\ \lambda$ c) $(m - ½)\ \lambda$ d) $2\ m\lambda$

45. Basically young's double slit experiment exhibits
a) Diffraction b) Polarization c) Reflection d) Interference

46. The fringe spacing in young's double slit experiment varies
a) Inversely with wavelength b) Directly with 'd' c) Inversely with 'd' d) Inversely with 'L'

47. The dark and bright fringes, in young's double slit experiment are of
a) Variable width b) Same width c) Zero width d) None of these

48. Which of the following light is used to increase the fringe spacing?
a) Red light b) Yellow light c) Green light d) Blue light

49. In Newton's rings, the them film between convex less and the glass plate is the
a) glass film b) air film c) light film d) oil film

50. In Michelson interferometer, the path difference is varied by moving the
a) compensator plate b) movable mirror c) telescope d) fixed mirror

51. Diffraction is prominent when the wavelength of light as compared with size of obstacle is
a) large b) small c) very small d) zero

52. Diffraction of X-rays will be prominent when inter-planer spacing of obstacle is ------ wavelength of x-rays
a) greater than b) less than c) comparable with d) much greater than

53. The wavelength of x-rays incident at Bray angle of 30^0 on a sodium crystal with atomic spacing 2×10^{-10} m for the first order reflection is
a) 0.5×10^{-10} m b) 1×10^{-10} m c) 2×10^{-10} m d) 3.46×10^{-10} m

54. Which one of the following cannot be polarized?
a) x-rays b) light waves c) sound waves d) ultraviolet rays

55. At the point of contact of lens and glass plate in Newton's rings, the thickness of air film is
a. zero b. 0.1 mm c. 0.2 mm d. 0.3 mm

56. The precision of Michelson interferometer is
a. 10^{-2} mm b. 10^{-3} mm c. 10^{-4} mm d. 10^{-5} mm

57. A typical diffraction grating has about -------- lines per centimeter.
a. 300 to 3000 b. 300 to 4000 c. 400 to 4000 d. 400 to 5000

58. X-ray diffraction is useful to find the structure of
a. hemoglobin b. DNA c. both a&b d. none of these

59. Optical rotation can be done with
a. sugar solution b. tartaric acid c. both a&b d. HCl

60. Light is produced by oscillating charges. Light can be polarized when this oscillation is confined to
a. one plane b. two planes c. three planes d. four planes

Assignment 2 Chapter 9 Subject: Physics Class: First year Total Marks: 8

Note: Write short answers

Q.1 What is the difference b/w interference and diffraction?

Q.2 What is polarization of light?

Q.3 What is fringe spacing? On what factors it depend?

Q.4 What do you mean by polaroid?