

Online Examinations (Even Sem/Part-I/Part-II Examinations 2020 - 2021)

Course Name -Physical Optics

Course Code - BOPT0204

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Answer all the questions. Each question carry one mark.

9. 1. Electromagnetic waves are

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- longitudinal
- transverse
- both longitudinal and transverse
- none of the above

10. 2. The separation of white light into its component colours is called

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- dispersion
- refraction
- reflection
- radiation

11. 3. The idea of secondary wavelets for the propagation of a wave was first given by

Mark only one oval.

- Newton
- Huygens
- Maxwell
- Fresnel

12. 4. Light propagates rectilinearly, due to

Mark only one oval.

- wave nature
- wavelengths
- velocity
- frequency

13. 5. According to Huygens' principle, light is a form of

Mark only one oval.

- particle
- rays
- wave
- radiation

14. 6. Why light is said to have a dual nature?

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- it exhibits the properties of wave and particles
- it exhibits the properties of reflection and diffraction
- It has both interference and polarization effect
- none of the above

15. 7. The wavenumber of a transition is 2000 cm^{-1} . In what part of the electromagnetic spectrum does this come?

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- ultraviolet-visible
- infrared
- microwave
- radio-wave

16. 8. Sun appears red at sun rise and sunset. This is due to scattering of

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- longer wavelengths
- shorter wavelengths
- lower frequencies
- all frequencies

17. 9. Which of the following are fundamentally different from the others?

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- Gamma rays
- radio waves
- sound waves
- light waves

18. 10. The number of optic axes in a uniaxial crystal is

Mark only one oval.

- 1
- 2
- 5
- 10

19. 11. Which of the following phenomena causes polarization of light?

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- reflection
- refraction
- double Refraction
- none of these

20. 12. A window which can transmit all the incident light without any reflection is called as

Mark only one oval.

- Option 1
- polarized Window
- Malus Window
- Brewster Window
- non-reflecting window

21. 13. From the polarization of light, one can conclude that

Mark only one oval.

- light is a transverse wave
- light is a longitudinal wave
- light can bend while facing a sharp edge of an object
- none of these

22. 14. When light is reflected from glass at the polarizing angle,

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- the reflected and refracted rays are parallel
- the reflected and refracted rays are perpendicular
- the electric vector is perpendicular to the reflecting plane
- none of these

23. 15. Polaroid sunglasses decrease glare on a sunny day because

Mark only one oval.

- block a portion of light
- refract the light
- have a special colour
- completely absorb the light

24. 16. Interference phenomena indicated

Mark only one oval.

- light is electromagnetic wave
- rectilinear propagation of light
- the wave nature of light
- none of these

25. 17. In Newton's ring experiment, coherent waves are produced by means of

Mark only one oval.

- division of wavefront
- diffraction
- division of amplitude
- none of these

26. 18. The center of the Newton's rings for the reflected system of a monochromatic source of light is

Mark only one oval.

- dark
- bright
- partially dark
- none of these

27. 19. Radii of Newton's rings are proportional to

Mark only one oval.

- square root of natural number
- square of natural number
- natural number
- none of these

28. 20. If white light is used in Newton's rings experiment, then

Mark only one oval.

- a number of coloured rings will be observed
- no rings will be observed
- black and white rings will be observed
- none of these

29. 21. If Young's double slit experiment with one source of light and two slits be performed in water instead of air

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- the fringes will be smaller in number
- the fringes will be narrower
- the fringes will be broader
- no fringes will be obtained

30. 22. Two waves having intensities in the ratio of 9:1 produce interference. The ratio of maximum to minimum intensity is equal to

Mark only one oval.

- 10 : 8
- 9 : 1
- 4 : 1
- 2 : 1

31. 23. When compact disk is illuminated by a source of white light, coloured lines are observed. This is due to

Mark only one oval.

- dispersion
- diffraction
- interference
- refraction

32. 24. The phenomenon of interference is based on

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- conservation of momentum
- conservation of energy
- conservation of momentum and energy
- quantum nature of light

33. 25. Two waves with phase difference 180° have resultant of amplitude

Mark only one oval.

- one
- zero
- same as the single wave
- doubles the single wave

34. 26. Extra distance travelled by one of waves compared with other is called

Mark only one oval.

- path
- displacement
- phase difference
- path difference

35. 27. Fraunhofer diffraction arises when the source of light and screen is effectively at

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- finite distance
- infinite
- semi-infinite
- none of these

36. 28. In Fraunhofer diffraction minima are

Mark only one oval.

- all perfectly dark
- never perfectly dark
- perfectly bright
- none of these

37. 29. The intensity of central maximum due to double slit diffraction pattern is -----
---times greater than that of single slit pattern.

Mark only one oval.

- 2
 3
 4
 8

38. 30. The resolving power of a grating, having N number of total rulings, in nth order is

Mark only one oval.

- n/N
 nN
 N/n
 none of these

39. 31. The nature of the wave front due to a point source of light is

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- it is abnormal in patient with spherical
 plane
 cylindrical
 none of these

40. 32. A diffraction pattern is obtained using a beam of red light. What happens if the red light is replaced by blue light

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- bands disappear
- bands become broader and farther apart
- no change
- diffraction bands become narrower and crowded

41. 33. The intensity of principal maximum in the Fraunhofer diffraction spectrum produced by a grating with N number of lines is proportional to

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- $1/N$
- N
- N^2
- $1/N^2$

42. 34. Resolving power of telescope can be increased by increasing

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- the wavelength
- the diameter of objective
- the diameter of eyepiece
- the focal length of eyepiece

43. 35. Resolving power of microscope depends upon

Mark only one oval.

- wavelength of light used (directly proportional)
- wavelength of light used (inversely proportional)
- frequency of light used
- focal length of objective

44. 36. The radius of the half period zone is proportional to _____

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- the wavelength of light
- the square root of the frequency of light
- the square root of the wavelength light
- the frequency of light

45. 37. Light of 600 nm is incident on a circular hole and is received on a screen 50 cm away. What is the radius of the hole, if the intensity of light on the screen is 4 times the intensity without the hole?

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- 0.0258 cm
- 0.0478 cm
- 0.0548 cm
- 0.0898 cm

46. 38. Tyndall effect is the scattering of the light by

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- air particles
- solid particles
- liquid particles
- colloidal particles

47. 39. Raman Effect supports

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- corpuscular theory
- wave theory
- quantum theory
- electromagnetic theory

48. 40. Why red light is at the top while violet at the bottom of the spectrum?

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- violet light has the medium speed so it is refracted the least.
- violet light has the highest speed so it is refracted the least
- red light has the slowest speed so it is refracted the least
- red light has the highest speed so it is refracted the least.

49. 41. Luminescence is because of

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- photons emitted while excited electrons drops down
- knocking out of electrons by photons
- photons stimulated by photons
- all

50. 42. Which photon processes are dominant in the context of diagnostic radiology?

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- Compton scattering and photoelectric effect
- Photoelectric effect and pair production
- Compton scattering and pair production
- Compton and Rayleigh scattering

51. 43. Flocculation refers to

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- purification of colloidal solution
- neutralization of charge on colloidal particles
- separating the particles of colloidal solution
- movement of colloidal particles

52. 44. Emission without a change in spin multiplicity

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- is called phosphorescence
- is called fluorescence
- is spin forbidden
- involves an intersystem crossing

53. 45. If the absorption of electromagnetic radiation by matter results in the emission of radiation of the same or longer wavelengths for a long time, the phenomenon is termed as which of the following?

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- Luminescence
- Fluorescence
- Phosphorescence
- Spontaneous emission

54. 46. The measurement of intensity of fluorescent X-rays provide a simple and _____ way of _____ analysis

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- destructive, quantitative
- non-destructive, quantitative
- destructive, qualitative
- Non-destructive, quantitative

55. 47. The energy of the emitted X-rays depends upon the _____ of the atom and their intensity depends upon the _____

Mark only one oval.

- Atomic number, amount of sample
- Mass number, amount of sample
- Mass number, concentration of atoms
- atomic number, concentration of atoms

56. 48. The fluorescence intensity increases with all of the following except

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- rigidity
- planarity
- No. of rings
- dissolved oxygen

57. 49. Heavy atom effect is not more with

Mark only one oval.

- F
- Cl
- Br
- all have equal effect and it depends on valency

58. 50. fluorometry

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- Mercury vapor lamp
- Xenon discharge lamp
- Deuterium lamp
- Lasers

59. 51. In He-Ne laser neon atoms get energy

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- on collision with He atoms
- from chemical reactions
- from electrical pumping
- from optical pumping

60. 52. In lasing action, the spontaneous emission does not depend on

Mark only one oval.

- the number of atoms present in the excited state
- the intensity of the incident light
- both intensity and number of atoms
- none of these

61. 53. The wavelength of of He-Ne laser is

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632.8 nm

600 nm

532.8 nm

500 nm

62. 54. For laser action to occur, the medium used must have at least

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4 energy levels

2 energy levels

3 energy levels

5 energy levels

63. 55. A three level laser system will be

Mark only one oval.

always pulsed

either CW or pulse

always CW

none of these

64. 56. The coherence length of laser is

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- directly proportional to the length of the active lasing medium
- directly proportional to the width of the spectral line
- inversely proportional to the width of the spectral line
- inversely proportional to the length of the active lasing medium

65. 57. A laser beam is used for locating distant objects because

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- it is monochromatic
- it is highly intense
- it is not observed
- it has small angular spread

66. 58. In case of laser, variation of divergence of a laser beam with distance gives us an idea about

Mark only one oval.

- brightness
- colour
- monochromaticity
- directionality

67. 59. The population of electron in different energy states of a system in the thermal equilibrium is governed by

Mark only one oval.

- Bragg's law
- Stefan's law
- Boltzmann distribution law
- Wien's displacement law

68. 60. Coherence of light is measured by

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- wave length of the beam
- interferometer
- brightness of the beam
- none of these

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