Avinashilingam Institute for Home Science and Higher Education for Women
(Deemed to be University under Category 'A' by MHRD, Estd. u/s 3 of UGC Act 1956)
Re-accredited with 'A+' Grade by NAAC. Recognised by UGC Under Section 12B
Coimbatore - 641 043, Tamil Nadu, India

Bachelor's Degree Examination – June / July 2021
II Semester

Class : I UG **Time : 3 Hours**
Major : Physics **Max. Marks : 100**

18BPHC05 Optics

Part A **10 x 1 = 10**
Choose the Correct Answer

1. The departures of real images from the ideal images, in respect of the actual size, shape and position are called CO1 K1
   a. aberrations b. coma
   c. distortion d. lens

2. A single lens cannot form an image free from CO1 K2
   a. aberrations b. chromatic aberration
   c. coma d. distortion

3. The magnifying power of simple microscope can be increased by decreasing the ___ of the lens. CO2 K3
   a. length b. objective
   c. focal length d. ocular

4. Ramsden's eyepiece consists of _____ lenses. CO2 K2
   a. one b. two
   c. three d. four

5. The continuous locus of all particles, which are in the same phase, is called a CO3 K1
   a. wave b. wave surface
   c. wave front d. ray

6. The destructive interference produces CO3 K4
   a. maximum intensity b. minimum intensity
   c. varying intensities d. all of the above

7. Each zone differs from its neighbour by a path difference of CO4 K2
   a. λ b. λ/2
   c. 2λ d. λ/3

8. Gratings used for the study of the visible region of the spectrum contain ___ lines per cm. CO4 K3
   a. 10 b. 100
   c. 10000 d. 1000

9. The polarization of light by reflection was discovered by CO5 K1
   a. bartholinus b. brewster
   c. malus d. fraunhofer

10. Identify an example of biaxial crystal is CO5 K1
   a. calcite b. quartz
   c. tourmaline d. aragonite

Part B **5 x 6 = 30**

Answer ALL questions

Each answer should not exceed 400 words or two pages

11.a. Discuss about longitudinal & lateral chromatic aberration with a neat diagram. CO1 K2

(or)

11.b. Describe circle of least chromatic aberration with a neat sketch. CO1 K1

12.a. Explain the construction and working of a Ramsden's eyepiece. CO2 K2

(or)

12.b. Distinguish between Ramsden's eyepiece & Huygens eyepiece. CO2 K4

13.a. Explain how will you determine the distance between coherent sources by using Fresnel biprism. CO3 K4

(or)

13.b. Write a note on circular fringes. CO3 K3

14.a. Compare the zone plate with a convex lens. CO4 K4

(or)

14.b. Derive an expression for dispersive power of grating. CO4 K4

15.a. State Brewster's law. Give its applications. CO5 K1

(or)

15.b. Compare the characteristics of positive & negative crystals. CO5 K4

Part C **5 x 12 = 60**

Answer ALL questions

Each answer should not exceed 800 words or four pages

16.a. Deduce the condition for achromatism when two lenses are placed in
i. contact and ii. separated. CO1 K4

(or)

16.b. Derive an expression for longitudinal chromatic aberration for
i. an object at infinity and ii. an object at finite distance. CO1 K4

17.a. Describe the following method for finding the velocity of light.
i. Michelson's rotating mirror method. (5)
ii. Kerr cell method. (7) CO2 K1

(or)

17.b. Explain the construction & theory of Huygens eyepiece. Find its focal length & position of cross wires. CO2 K3

18.a. Describe the principle, construction & working of Michelson's interferometer. CO3 K1

(or)

18.b. Discuss the theory of Newton's rings. Obtain the condition for bright & dark rings. CO3 K2

19.a. Describe and explain the Fraunhofer pattern obtained with a narrow slit and illuminated by a parallel beam of monochromatic light. CO4 K2

(or)

19.b. Explain the theory of plane transmission grating with a neat sketch. CO4 K3

20.a. Explain the theory & construction of quarter & half wave plates. CO5 K3

(or)

20.b. Explain how circularly polarized & elliptically polarized light are produced & detected. CO5 K2

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