19U509

Name: ....

Reg.No: ....

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2021

(CBCSS - UG)

CC19U PHY5 B08 - OPTICS

(Physics - Core Course)

(2019 Admission - Regular)

Time : 2.00 Hours

Maximum : 60 Marks

Credit : 3

Part A (Short answer questions)

Answer *all* questions. Each question carries 2 marks.

1. Define lateral magnification. What is the meaning of m= +1 and m= -1?

2. Two sources of intensities I and 4I are superimposed. Obtain the intensities where the phase difference is a) $\pi/2$ and b) π.

3. Write down the cosine law in interference and explain the symbols used.

4. What are the uses of interference on wedge shaped film?

5. What are the uses of Michelson's interferometer?

6. Why the diffraction of sound is more evident in daily life than light?

7. Why is grating spectrum called a normal spectrum?

8. In a zone plate the focal length of red colour is less that of violet. How?

9. Distinguish between o - ray and e - ray.

10. What is a wave plate? Explain its function.

11. What are the advantages of a hologram over an ordinary photograph?

12. What are the advantages of optic sensors?

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

Answer *all* questions. Each question carries 2 marks.

13. State and prove Fermat's principle of least time.

14. Write down the condition for producing interference. How Newtons rings are produced?

15. A convex lens of focal length 20cm is placed after a slit of width 0.6mm. If a plane wave of wavelength 600 nm falls normally on the slit evalulate the separation between the second minima on either side of the central maximum.

16. Discuss the production of circularly and elliptically polarised light.

17. Give the working of Laurent's half shade polarimeter. What does it measures.

18. What are the applications of Holography?

19. An optic fiber has a core of refractive index 1.54 and cladding of refractive index 1.45. Calculate the numerical aperture and acceptance angle.

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any *one* question. The question carries 10 marks.

20. Describe an experiment to detemine the wave length of sodium light using Fresnel's biprism.

21. Explain the rectilinear propagation of light on the basis of Fresnels half period zones.

(1 × 10 = 10 Marks)

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