C. ABDUL HAKEEM COLLEGE (AUTONOMOUS),
MELVISHARAM - 632 509.
SEMESTER EXAMINATIONS, NOVEMBER - 2018

B.Sc., PHYSICS **SEMESTER V**

U15MPH501 - OPTICS

Time: Three Hours Maximum: 75 Marks

SECTION - A (10 X 2 = 20 Marks)

Answer **ALL** Questions.

1. What is meant by spherical aberration?
2. Can you define Coma?
3. Define air wedge.
4. What are Brewster fringes?
5. What are missing orders in Fraunhofer's diffraction?
6. Tell about the resolving power of a grating.
7. Define double refraction.
8. State Kerr effect.
9. Define optical mixing.
10. Define coherence length.

SECTION - B (5 X 5 = 25 Marks)

Answer **ALL** Questions.

11. a) Mention the methods of minimizing spherical aberration.

(Or)

b) Drive the condition for achromatism of two thin lenses in contact.

12. a) Give the relevant theory to derive condition for bright and dark fringes in thin films.

(Or)

b) Explain the construction and working of Jamin's interferometer.

13. a) Explain diffraction of a circular aperture.

(Or)

b) Drive the resolving power of a telescope.

14. a) Explain Huygens's explanation of double refraction in uniaxial crystals.

(Or)

b) Tell about Polaroid's and their applications.

15. a) Briefly explain harmonic generation.

(Or)

b) Give the index matching condition in non-linear optics.

SECTION - C (3 X10 = 30 Marks)

Answer **ANY THREE** Questions.

16. Explain in detail the principle, construction and working of a constant derivation spectrometer.
17. Explain the construction and working of Michelson's interferometer and explain how is it used to find the resolution of spectral lines.
18. Give the theory of plane diffraction grating and explain how is it used to determine the wavelength of a monochromatic light.
19. Explain the determination of specific rotatory power of a sugar solution using Laurent's half shade polarimeter.
20. How is second harmonic generation achieved? Explain the experimental arrangement in details for second harmonic generation.

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