



MAL-003-001503

Seat No. _____

B. Sc. (Sem. V) (CBCS) Examination

October / November – 2016

Physics : Paper - 503

(Optics & Spectroscopy) (New Course)

Faculty Code : 003

Subject Code : 001503

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

- Instructions :** (1) All questions are compulsory.
(2) Symbols have their usual meaning.
(3) Figures on right hand side indicate full marks.

1 Answer all questions in short : 20

- (1) What do you mean by interference fringes ?
- (2) When the circular fringes are obtained in M.I. ?
- (3) Write down the path difference formula in case of M.I.
- (4) What do you mean by induced birefringence ?
- (5) Where pockets cell is used ?
- (6) Which effect is electrooptic effect ?
- (7) In Cotton-mouten effect the induced birefringence is given by which equation ?
- (8) In which crystal the velocity of e-ray is maximum along the optic axis ?
- (9) In which crystal E-ray leads O-Ray ?
- (10) According to wave mechanics the angular momentum is given by which equation ?
- (11) Which component is absent in Zeeman Effect in parallel view ?
- (12) Who introduced the idea of electron spin ?
- (13) Shape of an orbital is define by which quantum number ?
- (14) How many maximum number of electrons allowed in sub-shell ?
- (15) Which quantum number gives the energy as an electron ?
- (16) Which type of spectra falls in visible and UV region ?

- (17) If the change in energy is due to rotation of molecule, then which spectra is observed ?
- (18) Which line is observed when Raman Shift is negative ?
- (19) Raman Spectra are consisting of which lines ?
- (20) Why Raman tube is surrounded by a water jacket ?
- 2** (a) Answer any three : **6**
- (1) What is F.P. Interferometer ?
 - (2) What is anisotropic crystal ?
 - (3) What is Cotton-mouten effect ?
 - (4) What is Stark effect ?
 - (5) What are the Stokes and Antistokes lines ?
 - (6) How the linearly polarized light may be produced ?
- (b) Answer any three : **9**
- (1) Explain L.G. Plate
 - (2) Explain Retarders or wave plate
 - (3) Write advantages and disadvantages of TEM
 - (4) Write note on Quantum Numbers.
 - (5) Write the theory of Electronic Band Spectra.
 - (6) Write six applications of Raman Spectroscopy.
- (c) Answer any two : **10**
- (1) Explain F.P. Interferrometer with necessary diagram.
 - (2) Discuss Nichol prism in detail.
 - (3) What do you mean by SEM ? Discuss SEM with necessary diagram.
 - (4) Discuss Zeeman Effect in detail.
 - (5) Give the theory of rotational-vibrational Spectra.
- 3** (a) Answer any three : **6**
- (1) In M.I. why plate G_2 is known as compensating plate ?
 - (2) What is LCD ? Write its uses.
 - (3) What is Babinet Compensator ?
 - (4) What is the difference between Zeeman Effect and Paschen Back Effect ?
 - (5) Write the difference between E-Ray and O-Ray.
 - (6) What do you mean by Polarizer and Analyzer ?

- (b) Answer any three : 9
- (1) Explain determination of wavelength with M.I.
 - (2) Explain types of polarized light.
 - (3) Give the advantages of AFM.
 - (4) Explain Anomalous Zeeman Effect.
 - (5) Explain Space quantization.
 - (6) Give the difference between Raman Spectra and Fluorescence Spectra.
- (c) Answer any two : 10
- (1) Discuss intensity distribution in multiple beam interference.
 - (2) Explain Huygens explanation of Double refraction.
 - (3) Discuss superposition of waves linearly polarized at right angles.
 - (4) Explain Vector atom model and Normal Zeeman Effect.
 - (5) Discuss observation of Raman Spectra in detail with necessary diagram.
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