|--|

Total No. of Pages : 02

Total No. of Questions : 09

M.Sc (Physics) (Sem.–3) FIBRE OPTICS AND NON-LINEAR OPTICS Subject Code : MSPH-534-21 M.Code : 92538 Date of Examination : 21-12-22

Time: 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

- 1. Write briefly :
 - a) Write about the basic fibre construction and principle of light propagation through it.
 - b) What do you mean by numerical aperture?
 - c) What do you mean by bending losses?
 - d) What is the difference between uniaxial and biaxial crystals?
 - e) What is strain optic tensor?
 - f) What do you mean by longitudinal electro-optic modulator?
 - g) Give different Huygenian construction to get polarized light.
 - h) Discuss the importance of wave guide.
 - i) Write a short note on importance and characteristics of coatings of fibres.
 - j) What do you mean by anharmonic potential?

SECTION-B

- 2. Discuss the terms 'dispersion' and 'attenuation' related to fibres.
- 3. Discuss the comparison among different fibre fabrication processes.
- 4. Derive the relation for electromagnetic energy stored in an anisotropic medium.
- 5. What do you mean by electro-optic effect? Differentiate between linear and quadratic electro-optic effects.
- 6. What do you mean by non-linear susceptibilities? Differentiate between macroscopic ad microscopic susceptibility.

SECTION-C

- 7. What are the different kinds of optical fibres? Describe their construction and working. Discuss their advantages also.
- 8. What do you mean by Raman Nath diffraction? Describe Raman Nath acousto-optic modulator.
- 9. What do you mean by mass production of fibres? What are the cable design requirements? Discuss typical cable design and testing.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.