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Y—103—2019

FACULTY OF SCIENCE

B.Sc. (Third Year) (Sixth Semester) (Backlog) EXAMINATION

NOVEMBER/DECEMBER, 2019

(CBCS Pattern)

PHYSICS

Paper XIV

(Atomic, Molecular and Nuclear Physics)

(Thursday, 19-12-2019)

Time : 10.00 a.m. to 12.00 noon

Time— Two Hours

Maximum Marks—40

N.B. :—All questions are compulsory and carry equal marks.

1. Attempt any *four* (each of 2 marks) : 8
 - (i) Define Spin quantum number.
 - (ii) State interval rule.
 - (iii) What are the anti-Stokes lines ?
 - (iv) Define conservation of nucleons.
 - (v) Give the (n, α) transmutation reaction.
 - (vi) Define nuclear fusion.
2. Attempt any *two* of the following (each of 4 marks) : 8
 - (a) Explain vector atom model.
 - (b) Explain orbital and magnetic quantum number.
 - (c) Give the theory of pure rotational spectra.
3. Attempt any *one* of the following : 8
 - (a) Explain anomalous Zeeman effect.
 - (b) Give the theory of rotation-vibration spectra.

P.T.O.

4. Attempt any *two* of the following (each of 4 marks) : 8
- (a) Explain fission products in nuclear fission.
 - (b) Explain energy release in fission.
 - (c) Draw the neutron cycle in nuclear fusion.
5. Attempt any *one* of the following : 8
- (a) Explain nuclear reaction kinematics in nuclear fission.
 - (b) Explain P-P-chain reaction as the source of energy in the sun like stars.