V—78—2017

FACULTY OF SCIENCE

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

OCTOBER/NOVEMBER, 2017

PHYSICS

Paper XIV (PHY-304)

(Atomic, Molecular and Nuclear Physics)

(Tuesday, 14-11-2017)   **Time : 10.00 a.m. to 12.00 noon**

Time—2 Hours   *Maximum Marks—40*

N.B. :—   (i)   *All* questions are compulsory.

       (ii)   Figures to the right indicate full marks.

1.   Attempt any *four* :   8

   (a)   State Raman effect.

   (b)   State Pauli's exclusion principle.

   (c)   State Normal Zeeman effect.

   (d)   State conservation law of energy.

   (e)   Define elastic scattering.

   (f)   Write any *two* quantum numbers associated with vector atom model.

2.   Attempt any *two* :   8

   (a)   Explain vector atom model in detail.

   (b)   Explain the theory of pure rotational spectra.

   (c)   Explain chain reacting system.

   (d)   Explain energy release in fission.

3.   Attempt any *two* :   8

   (a)   Explain J-J coupling.

            P.T.O.

(b) Explain rotational-vibrational spectra of diatomic molecule.

(c) Explain nuclear fission as a source of energy.

(d) Explain mass and energy distribution of fission products.

4. Attempt any *one* : 8

(a) Describe Stark effect in detail.

(b) Explain nuclear reaction Kinematics and obtain Q-value of nuclear reactions.

5. Write notes on any *two* : 8

(a) L-S coupling

(b) Regions of electromagnetic spectra

(c) Energy release in stars

(d) Controlled thermonuclear reactions.