AO—77—2018

FACULTY OF SCIENCE

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

MARCH/APRIL, 2018

PHYSICS

Paper XIV (PHY-304)

(Atomic and Molecular and Nuclear Physics)

(Wednesday, 28-3-2018)   **Time : 10.00 a.m. to 12.00 noon**

Time—2 Hours   *Maximum Marks—40*

N.B. :— (i)   *All* questions are compulsory and carry equal marks.

       (ii)   Figures to the right indicate full marks.

1.   Solve any *four* :   8

     (a)   State interval rule.

     (b)   State transverse Zeeman effect.

     (c)   Define nuclear fission.

     (d)   Explain J-J coupling.

     (e)   State Q value equation in nuclear reaction kinematics.

     (f)   State Law of conservation of charge in a nuclear reaction.

2.   (a)   Explain the concept of spinning electron in vector atom model.   8

     (b)   Give the experimental study of Zeeman effect.

Or

     (x)   Explain the selection rule and intensity rule for the appearance of a spectral line in an atomic spectra.

     (y)   Give the results of Stark effect.

3.   (a)   Explain the theory of pure rotational spectra.   8

     (b)   Explain any *four* categories of nuclear reaction.

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Or

(*x*) Give the experimental study of Raman effect.

(*y*) Explain energy released in nuclear fission.

4. Give an account of chain reacting systems in detail. 8

Or

Explain controlled thermonuclear reactions.

5. Write short notes on (any *two*) : 8

(*a*) L-S coupling

(*b*) Spatial quantization

(*c*) Relation for Zeeman shift

(*d*) Energy production in stars.