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B—103—2019

FACULTY OF SCIENCE

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

MARCH/APRIL 2019

(CBCS Pattern)

PHYSICS

Paper XIV (DSCP II)

(Atomic, Molecular and Nuclear Physics)

(Saturday, 30-3-2019) **Time : 10.00 a.m. to 12.00 noon**

Time—2 *Hours* *Maximum Marks*—40

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

1. Attempt any *four* (each of **2** marks) : 8

   (*i*) State orbital quantum number.

   (*ii*) What are stokes lines in Raman effect ?

   (*iii*) Define Nuclear Fission reaction.

   (*iv*) What is thermonuclear reaction ?

   (*v*) State Pauli's exclusion principle.

   (*vi*) Write the types of molecular spectra.

2. Attempt any *two* of the following (each of **4** marks) : 8

   (*a*) Explain Stark effect with a neat labelled diagram.

   (*b*) Explain the regions of molecular spectra.

   (*c*) Describe the vector atom model in detail.

3. Attempt any *one* of the following (each of **8** marks) : 8

   (*a*) Explain quantum numbers associated with vector atom model.

   (*b*) Give the theory of the pure rotational spectra.

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4. Attempt any *two* of the following (each of **4** marks) : 8

   (*a*) Explain the fission products in Nuclear fission reaction.

   (*b*) Explain controlled thermonuclear reactions.

   (*c*) Explain P-P chain reaction as the source of energy.

5. Attempt any *one* of the following (**8** marks each) : 8

   (*a*) Explain Nuclear reaction kinematics in detail.

   (*b*) Discuss in detail the thermal nuclear reactor as a neutron cycle.