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B. Sc. (Hons.)-M.Sc. (Dual Degree)

EXAMINATION, 2021

(Seventh Semester)

(C Scheme) (Main Only)

CHEMISTRY

CH651C

Nuclear Chemistry

Time : 2½ Hours] [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. (a) Define the β-radioactivity of $_{11}{}^{23}Na_{12}$ nuclei.

(b) What different exchange forces are responsibile for stability of a nuclei.

(c) Discuss the role of columbic repulsion in nuclear potential.

2. (a) How semi-empirical mass equation is related with Liquid drop model ?

(b) Discuss Collective rotation in even-even nucleic.

3. (a) Define energy spectrum of α-particles. Also explain the range and ionizing power of these particles.

(b) Give different types of photonuclear reactions with their special features.

(c) What is compound nucleus ? How are they formed ?

4. Write a note on Nuclear fission reaction.

5. Explain the following :

(i) Photoelectric Effect

(ii) Compton effect

(iii) Radiolysis of aqueous solutions.

6. (a) Explain Szilard-Chalmers reaction.

(b) How are radioisotope tracers used in chemical investigation ? Explain with the help of suitable examples.

(c) Explain the term probing of isotope.

7. Write a note on isotopic dilution analysis.

8. (a) Define principle and basic component of scientilation counters.

(b) What are solid state detectors.