

Roll No.

76054

**M.Sc. 3rd Semester Chemistry
Examination-December, 2015**

INORGANIC SPECIAL-II

Paper : CH-502 P-XII

Time : 3 hours

Max. Marks : 80

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

Note : Q. No. 1 is compulsory. Attempt five questions in all, selecting one question from each Section.

1. Answer the following in short :

(a) Explain the binding energy. 2

(b) What do you mean by α -decay ? Give an example. 2

(c) What is pair production effect ? 2

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(b) Explain the principle, working and applications of the proportional counter. 10

SECTION - D

8. (a) How will you explain the nuclear fission by various theories ? 12

(b) Explain about the photonuclear reactions. 4

9. (a) How will you explain the various fission probabilities of fission of uranium nucleus. 8

(b) Describe the working of cyclotron. 8

(d) Explain the principle of the radiometric titration ? 2

(e) Define fragmentation nuclear reaction. 2

(f) Draw a sketch of the liquid GM counter. 2

(g) Write about the solid state detector. 2

(h) Explain the breeder reactor. 2

SECTION - A

2. (a) How will you explain the nuclear stability in terms of mean binding energy ? 8

(b) How will you explain the decay of unstable nuclei ? 8

3. (a) Describe the collective model for the nuclear structure in detail. 12

(b) Explain the merits of a shell model. 4

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SECTION - B

4. Explain the various effects generated due to the interactions of radiation with matter. 16

5. (a) Describe the principle and applications of the isotopic dilution technique. 12

(b) Explain the merits of the radiometric titrations. 4

SECTION - C

6. (a) Give the diagram of the scintillation counter and explain its working. 10

(b) Write the applications of the G.M. counter. 6

7. (a) Draw the sketch of a ionization counter and explain its working. 6