Reg. No. | | | | | | | | | | |

MANIPAL ACADEMY OF HIGHER EDUCATION

(Deemed University)

SECOND YEAR B.Sc. N.M.T. DEGREE EXAMINATION – SEPTEMBER 2005

SUBJECT: RADIATION CHEMISTRY AND RADIATION PHYSICS

Tuesday, September 27, 2005

Time: 3 Hrs. Max. Marks: 80

✍ **Answer Section – 'A' and Section – 'B' In Two Separate Answer Books.**

SECTION – A : RADIATION CHEMISTRY : 30 MARKS

1. Answer any ***SIX***:

1A. Co ordinate Covalent bond.

1B. Bases.

1C. Weak acids.

1D. pH.

1E. Brownian Movement.

1F. Oxidation Reduction Reactions.

1G. Normality.

(5×6 = 30 marks)

SECTION – B : RADIATION PHYSICS : 50 MARKS

2. Answer any ***TWO***:

2A What are the different modes of decay? Explain Positron decay and Electron capture.

2B. Define specific ionisation, linear energy transfer and range.

2C. Explain the photoelectric process in detail.

(5×2 = 10 marks)

3. Answer the following:

3A. Give the general equation and explain Secular and Transient equilibrium.

(20 marks)

3B. i. Describe the principle and operation of Geiger Muller detectors.

ii. Derive the expression $A = A_0 e^{-\lambda t}$.

iii. Explain the Compton scattering of electromagnetic radiations in the absorber.

(10+5+5 = 20 marks)

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MANIPAL ACADEMY OF HIGHER EDUCATION

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SECOND YEAR B.Sc. N.M.T. DEGREE EXAMINATION – SEPTEMBER 2005

SUBJECT: RADIOPHARMACY

Wednesday, September 28, 2005

Time: 3 Hrs. Max. Marks: 80

Answer all questions. Draw diagrams and flow charts wherever appropriate.

1. With the help of the neat and labelled diagrams, explain the primary sources of radionuclides. (20 marks)

2. What are the ideal characteristics of imaging, in-vitro and therapeutic radiopharmaceuticals? List the physical and chemical desirable characteristics of 99mTc as an imaging radionuclide. (20 marks)

3. Describe the significance of quality control procedures in Radiopharmacy. Briefly describe each of the routine QC tests to be performed on the radiopharmaceuticals. (20 marks)

4. Write short notes on any ***FOUR***:

4A. Radioactive equillibria.

4B. Radioactive Waste disposal methods.

4C. Nebuliser.

4D. Myocardial perfusion agents.

4E. Biodistribution.

(5×4 = 20 marks)