[This question paper contains 2 printed pages.]

Your Roll No.....

Sr. No. of Question Paper	:	**4663**	**L**
Unique Paper Code	:	222600001	
Name of the Paper	:	SEC-Radiation Safety	
Name of the Course	:	**B.Sc. (H)/ B.Sc. (Prog.) - UGCF-NEP (SEC)**	
Semester	:	IV	

Duration : 1 Hours Maximum Marks : 30

Instructions for Candidates

1. Write your Roll No. on top immediately on receipt of this question paper.
2. Attempt FOUR questions in all.
3. Question 1 is compulsory.
4. Use of scientific calculator is allowed.

1. Attempt any THREE parts of the following question: (3×2 = 6)
   a. A teacher uses a thin sheet of paper, an aluminum sheet and a thick block of lead to identify radiation types. Which radiation is stopped by which material and why?
   b. What are the primary methods for reducing exposure from unsealed sources?
   c. How is KERMA different from ALI (Annual Limit of Intake) of radiation?
   d. Why are ferromagnetic materials banned in an MRI room?

2. a. Define stopping power, range and straggling of an ionizing radiation. (4)
   b. Compare the ionization mechanism of alpha particles with that of gamma rays. (4)

3. a. A radioactive nuclide has a half life of 20.0 y. What fraction of an initially pure sample of this nuclide will remain undecayed at the end of:
   i) 40.0 y
   ii) 60.0 y (4)

b. Describe any two ways to protect radiation workers from radiation hazards. How can radiation exposure be monitored. (4)

4. a. Sketch the operational curve of a Geiger Muller counter. Describe its working with special emphasis to quenching (4)
   b. What is the role of a photomultiplier tube in a scintillator detector? Describe its working. (4)

5. a. Elucidate the basic physical mechanism used in CT imaging OR PET scanning. (4)
   b. Mention and elaborate any two industrial uses of radiation. (4)