

Roll No.

Total No. of Pages : 02

Total No. of Questions : 11

M.Sc. (Physics)EL-I (2018 Batch) (Sem.-3)

**RADIATION PHYSICS**

Subject Code : MSPH535-18

M.Code : 76754

Time : 3 Hrs.

Max. Marks : 70

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains SEVEN questions carrying FIVE marks each and students have to attempt any SIX questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

**1. Write briefly :**

- (a) What do you mean by minor interaction processes?
- (b) Calculate the energy of gamma ray after scattering through  $90^\circ$ .
- (c) What is meant by Range-energy relationship?
- (d) What is Bremsstrahlung? Explain its energy and Z dependence.
- (e) Why Li is doped in Si(Li) detectors?
- (f) Mention the general size and energy range of Si(Li) and NaI(Tl) detectors.
- (g) What is meant by spectroscopy?
- (h) What do you understand by Neutron activation analysis?
- (i) Discuss the working principle of PIXE.
- (j) What do you understand by Therapeutic nuclear medicine?

## SECTION-B

2. What do you understand by Compton scattering? How it is different from photoelectric effect?
3. Compare the results of the attenuation measurements performed using broad and narrow geometries. Discuss the effect of multiple scattering.
4. Draw the spectrum of 662 keV gamma rays emitted from the  $^{137}\text{Cs}$  sources taken with NaI (Tl) detector and HPGe detector. Label the energies of the backscatter peak, Compton edge and photopeak in both the spectra.
5. Discuss the concept and importance of Perturbed angular correlation in context of Nuclear spectroscopy.
6. Suggest a method to measure the g-factor.
7. What is meant by XRF? Discuss some of its important features.
8. Discuss the concept and importance of Diagnostic nuclear medicines.

## SECTION-C

9. Discuss various processes through which the electrons interact with the matter. Discuss the dependence of backscattering of electrons as a function of  $Z$ .
10. Differentiate between organic and inorganic scintillation detectors using suitable examples.
11. Discuss the principle of Mossbauer effect and the instrumentation required to its measurements. Mention its applications.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**