

Duration: 3 Hours

Total Marks Assigned: 80



Note:

1. Question one is compulsory.

2. Solve any three from remaining and assume suitable data

- Q1. Solve any four** 20
- What are different laws of Radioactivity?
 - Explain Compton scattering with an example.
 - What is dark current in PMT?
 - Define the terms a) Pre-amplifiers b) Shaping amplifiers c) Discriminators d) Scalars e) Count rate meter.
 - What do you understand by Lithium ion drifted solid state detector.
- Q2. a** List out the techniques for Radiation detection. Discuss Proportional counter and Geiger Muller counter in detail. 10
- Q2. b** Explain the working of "Gamma camera" with the block diagram 10
- Q3.a** Explain Gas filled detector with its volt ampere characteristics. 10
- Q3.b.** Explain Nuclear Instrumentation for toxic fluid tank level measurement 10
- Q4.a.** What are Multi-Channel Analyzers? Explain in brief. 10
- Q4.b.** Explain "Radiation Uptake Studies" with block diagram. 10
- Q5.a.** What is half life period? The half life of radon is 3.8 days. After how many days Will only one $1/20^{\text{th}}$ of radon sample be left over? 10
- Q5.b.** Explain the role of Nuclear ADCs with their performance parameters 10
- Q6. Write a short note on any two.** 20
- Photon Counting System
 - Food irradiation
 - Single Channel Analyzers
 - TLD
