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St. No. of Question Paper: 2148
Unique Paper Code : 32223907

G.C-3

Name of the Paper : Radiation Safety SEC

Name of the Course : B.Sc. (Hons.) Physics: CBCS

Semester : Semester-III

Duration: 3 hours

Maximum Marks: 75

Attempt *five* questions in all.

Question No. 1 is compulsory.

All questions carry equal marks.

Use of non-programmable scientific calculator is allowed.

- Q1. Attempt any *five* of the following questions: (5x3=15)
- What are *auger electrons*?
 - What is linear attenuation coefficient?
 - Differentiate between *absorbed dose* and *equivalent dose*.
 - What are the main functions of International Commission on Radiological Protection?
 - Give three applications of nuclear technique in crime detection.
 - What does the Q value of a nuclear reaction signify?
 - What do you understand by Cherenkov Radiation?
 - What is KERMA? What is its SI unit?
- Q2. (a) What do you understand by Bremsstrahlung X-rays? Differentiate it from Characteristic X-rays? (7)
- (b) What is the law of radioactive decay? Derive an expression for half-life of a radioactive isotope? (8)
- Q3. (a) Explain the phenomena of Photoelectric effect and Compton Scattering. (8)
- (b) How do neutrons interact with matter? Explain. (7)
- Q4. (a) Describe a Geiger Muller counter and explain its working. (8)
- (b) Explain the basic concept and working principle of scintillation counter. (7)
- Q5. (a) Give a brief idea about Accelerator driven Sub-critical system (ADS) for waste management. (7)
- (b) Explain the term ionization radiation. What are the biological effects of ionization radiation? (8)
- Q6. (a) How are nuclear techniques applied in the field of medical science? (8)

(b) What are the applications of nuclear techniques in the industrial uses? (7)

Q7. (a) What is binding energy of a nucleus? Calculate the binding energy per nucleon for ^{63}Cu . Given, mass (^{63}Cu) = 62.91367u, mass (proton) = 1.00728u, mass (neutron) = 1.00867u (8)

(b) Describe the interaction of charged particles with matter? (7)

Q8. (a) Describe the principle and working of solid state detectors. (8)

(b) ~~Write~~ a short note on safety and risk management of radiation. (7)

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