

Roll No.

Total No. of Questions : 7]
(2032)

[Total No. of Printed Pages : 3

UG (CBCS) IIIrd Year (Annual) Examination

3232

B.Sc. PHYSICS

(Radiation Safety)

(SEC-3)

Paper : PHYS 307 TH

Time : 3 Hours]

[Maximum Marks : 50

Note :- Attempt any five questions.

1. (a) What is Q-value of a nuclear reaction ? Derive an expression for Q-value of a nuclear reaction in terms of masses and kinetic energies of incident particle, product particle and nuclei.

(b) Calculate mass defect, binding energy and binding energy per nucleon for nickel nuclei

Given : Mass of ${}_{28}\text{Ni}^{64}$ nucleus = 63.9126

a.m.u. $m_p = 1.007285$ a.m.u. $m_n = 1.008665$

a.m.u. 1 a.m.u. = 931 MeV.

7,3

CH-32

(1)

Turn Over

2. What is Einstein's photoelectric equation ? Explain the experimental observation of photoelectric effect on the basis of this equation. 10
3. (a) Explain the terms absorbed dose, effective dose and equivalent dose.
- (b) Explain different natural sources of radiations in reference to exposure. 6,4
4. (a) Explain principle, construction and working of ionization chamber.
- (b) Differentiate between ionization chamber and G.M. counter. 7,3
5. (a) What do you mean by biological effects of ionizing radiations ? Discuss them in detail.
- (b) What is ICRP ? Explain its different principles. 7,3
6. (a) Explain principle, construction and working of Positron Emission Tomography (PET).
- (b) What is Radiation Therapy ? 7,3

7. Write short notes on the following :

(i) Bremsstrahlung

(ii) Effects of nuclear radiations on human body 5,5

Student Strength-80
HOUSE EXAMINATION
Radiation Safety
PHYS307TH

Duration: 1 hour and 30 minutes

Maximum Marks: 10

Instructions:

i. Attempt Three question in total.

ii. Each question carry equal marks.

1. a. Explain the concept of Bremsstrahlung and auger electron.

b. Discuss various types of nuclear reaction.

2. a. Write short note on sealed and unsealed source of radiation.

b. What is Compton scattering? Derive expression for Compton shift.

c. Define linear and mass attenuation coefficient.

3. a. Derive Bethe-Bloch formula.

b. Explain Straggling effect.

4. Write short note on following:

a. KERMA

b. Absorbed dose and effective dose

c. Annual limit of intake (ALI)