Con. 9119-12.

(REVISED COURSE)

KR-4425

(3 Hours)

[Total Marks 100

N.B. (1) Question No. 1 is **compulsory**.
(2) Attempt any **four** questions out of remaining **six** questions.
(3) **Figures** to the **right** indicate full **marks**.

1. (a) State a law of radioactive decay and derive expression for half life of a radionuclide. 5
(b) What are various units of radiation exposure ? 5
(c) Explain Isomeric transition. 5
(d) Discuss various positron emitting radionuclides. 5

2. What is scintillation detector ? Explain in detail the principle of operation and working of scintillation counting system. Also explain Differential and Integral counting. 20

3. (a) What is the principle involved in Radio immunoassay. Explain the RIA (Radio immunoassay) technique in detail. 15
(b) State various applications of Radio immunoassay. 5

4. (a) With the help of detailed block diagram explain working of SPECT. 10
(b) What are various reconstruction techniques employed in SPECT ? Explain any one in detail. 10

5. (a) With the help of detailed block diagram explain working of Gamma camera. 10
(b) Explain various components and working principle of PET scanner. 10

6. (a) What is a principle of radiation safety ? How it is achieved ? 10
(b) Explain in detail principle and working of rectilinear scanner. 10

7. Write short notes on (any **four**) :— 20
(a) Ionization and excitation
(b) Biological effects of radiation exposure
(c) Gas filled detector
(d) Alpha and Beta decay
(e) Semiconductor detector.