

**First Year B.Sc Radio Therapy Technology Degree Supplementary
Examinations June 2025**

**Paper IV - General and Nuclear Physics
(2023 Scheme)**

Time: 3 Hours

Total Marks: 100

- *Answer all questions to the point neatly and legibly* • *Do not leave any blank pages between answers* • *Indicate the question number correctly for the answer in the margin space*
- *Answer all parts of a single question together* • *Leave sufficient space between answers*
- *Draw table/diagrams/flow charts wherever necessary*

Essays:**(2x15=30)**

1. What is a transformer. Explain in detail Step up transformer, step down transformer and Autotransformer, what is transformer turn ratio
2. Explain the basic principle and applications of a galvanometer. How a galvanometer can be converted into ammeter and voltmeter.

Short notes:**(8x5=40)**

3. Fourier transform and its application in image processing.
4. Explain mean mode and median with examples.
5. Explain scalar and vector quantities with examples.
6. Describe complex numbers and their properties.
7. Explain Star and delta connection with diagrams.
8. What is electromagnetic induction. Explain mutual induction and self induction.
9. What do you mean by doping. State the necessary condition for doping and methods of doping.
10. Explain nuclear fission and nuclear fusion with example.

Answer briefly:**(10x3=30)**

11. Define capacitance, inductance and resistance. Give its SI units.
12. Explain eddy current and eddy current losses.
13. Peak, RMS and average value of AC voltage and current
14. What is intrinsic and extrinsic semiconductors.
15. What is simple harmonic motion.
16. What is auger electrons.
17. What is a pre read kilovoltmeter in an X ray generator circuit
18. What is an RC circuit, what is the time constant in an RC circuit.
19. What is hysteresis loss in transformer.
20. What is half-life and decay constant of a Radioactive isotope.
