



**SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH**

**(A DEEMED TO BE UNIVERSITY)**

**B.Sc. Allied Health Sciences Second Year Semester-III**

**March 2025 Examination**

**B.Sc. Radiotherapy Technology**

**Time: 2.30 Hrs.**

**[Max. Marks: 80]**

**Subject: Fundamentals of Physics**

**Q.P Code: K3520**

*Your answers should be specific to the questions asked.*

*Draw neat labelled diagrams wherever necessary.*

**Long essay**

**(2x10=20marks)**

1. Explain in detail about the parts of x-ray tube with neat diagram.
2. Write the difference between stationary anode and rotating anode

**Short essay**

**(6x5=30marks)**

3. What is a Transformer? Mention the types of transformers?
4. Explain about Kirchhoff's law with proper circuit diagram.
5. What are the factors influencing the quality and quantity of x-rays.
6. What are the difference between nuclear fusion and nuclear fission reaction? Give examples.
7. Write in detail about Beta decay.
8. Write a note on conductor, insulator and semiconductor.

**Short answer**

**(10x3=30marks)**

9. Explain isotope, isobar and isotone with proper example.
10. Define Electron volt.
11. Different types of target material used in x-ray tube and mention its properties.
12. Define transient equilibrium with examples.
13. Write the properties of alpha particle.
14. What is P-N junction diode?
15. Define Half-life and Tenth-life.
16. Define coherent scattering
17. Write about the properties of electron.
18. Define kVp and mAs.



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**Time: 2.30 Hrs.**

**[Max. Marks: 80]**

**Subject: Radiation safety**

**Q.P Code: K3530**

*Your answers should be specific to the questions asked.*

*Draw neat labelled diagrams wherever necessary.*

**Long essay**

**(2x10=20marks)**

1. Write in detail about Radioactive Decay and its types.
2. What is the principle of radiation protection and explain about effects of time, distance, and shielding?

**Short essay**

**(6x5=30marks)**

3. What is a chromosomal aberration and explain its type with a neat diagram?
4. Define Activity and KERMA with its units.
5. Write a note on early somatic effect for whole body irradiation.
6. Write in detail about the Gas filled detector with a neat diagram.
7. Explain the production of characteristic x-rays with a neat diagram.
8. Write a short note on shielding used in X ray installation.

**Short answer**

**(10x3=30marks)**

9. Define equivalent dose with the weighting factor
10. Write about stochastic with example?
11. Define Radiography units.
12. What is linear attenuation coefficient?
13. Calculate Workload for radiography (fixed) installation considering 50 patients/day, 2 films used per patient and 40 mAs used per film and facility is operational 6 days per week?
14. Write the properties of electromagnetic radiation.
15. Write about lead apron
16. Define LET.
17. Write the working principle of TLD.
18. Define primary radiation

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**B.Sc. Radiotherapy Technology**

**Time: 2.30 Hrs.**

**[Max. Marks: 80]**

**Subject: Medical Physics**

**Q.P Code: K3540**

*Your answers should be specific to the questions asked.*

*Draw neat labelled diagrams wherever necessary.*

**Long essay**

**(2x10=20marks)**

1. Define rectifier and mention its types with circuit diagram.
2. Write in detail about generation of CT scanner.

**Short essay**

**(6x5=30marks)**

3. Explain about filters, types and uses.
4. Write about dental x-ray units.
5. Explain about High Tension (HT) cable.
6. What are the differences between fixed radiography and fluoroscopy unit?
7. Write in detail about compression peddle in mammography units.
8. What are the Factors affecting quality and quantity of x-ray.

**Short answer**

**(10x3=30marks)**

9. What is meant Heel effect?
10. Write about properties of tungsten and molybdenum
11. Define Tube voltage and tube current.
12. Draw and label the parts of the x-ray tube.
13. Define Heat unit and electron volt.
14. Write a short note on Tube cooling in X ray tube
15. Write a short on X-ray tube housing.
16. Define focal spot.
17. What is rotating anode?
18. Write the difference between Radiotherapy and Radiology

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