

SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH

(A DEEMED TO BE UNIVERSITY)

B.Sc. Allied Health Sciences Second Year (Semester-III)

March 2022 Examination

B.Sc. Radiotherapy Technology (RTT)

Time: 3 Hrs.

[Max. Marks: 100]

Fundamentals of Physics Paper-I

Q.P Code: J3550

Your answers should be specific to the questions asked.

Draw neat labeled diagrams wherever necessary.

LONG ESSAY

2 X 10 = 20 Marks

- 1 What is rectifier and its types. Explain about it with neat circuit.
- 2 Explain about production of artificial radioactive isotopes and write some radionuclides used in medicine.

SHORT ESSAY (Answer any Ten)

10 X 5 = 50 Marks

- 3 What is a Transformer? Mention the types of transformers?
- 4 Construction and working of x-rays.
- 5 Structure of atom and Define Electromagnetic force and Nuclear force.
- 6 Define Radioactive equilibrium and its types. What type of radioactive equilibrium exists between radium and radon?
- 7 What are alpha, beta and gamma rays. Enumerate their properties?.
- 8 Principles of Semiconductors
- 9 Principle of nuclear reactor.Mention the types of nuclear reactors?
- 10 X-ray spectrum
- 11 Enumerate the properties of Electromagnetic radiation. and its types
- 12 Factors influencing the quality of x-rays produced.
- 13 Conductivity of electricity through gases at low pressure.
- 14 Name the two Kirchhoff's laws and explain them with the help of circuit diagram.

SHORT ANSWERS (Answer any Ten)

10 X 3 = 30 Marks

- 15 Radionuclides used in medicine
- 16 Ohm's law and Coulomb's law
- 17 Disintegration law and activity.
- 18 Radium properties
- 19 Properties of X-rays.
- 20 Conductor and insulator
- 21 Mutual induction and self-induction
- 22 Electron volt
- 23 Specific gamma ray emission
- 24 Florescence and Phosphorescence.
- 25 Ionization and excitation
- 26 Energy , power and velocity

* * *



SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH

(A DEEMED TO BE UNIVERSITY)

B.Sc. Allied Health Sciences Second Year (Semester-III)

March 2022 Examination

B.Sc Radiotherapy Technology (RTT)

Time: 3 Hrs.

[Max. Marks: 100]

Paper-II

Radiation safety

Q.P Code: J3560

Your answers should be specific to the questions asked.

Draw neat labeled diagrams wherever necessary.

LONG ESSAY

2 X 10 = 20 Marks

- 1 Write about the different types of detectors for different types of radiation measurement.
- 2 Describe in detail about thermoluminescence dosimeter. Mention other types of personal monitoring devices? Advantage and disadvantages of each of them in comparison with TLD?

SHORT ESSAY (Answer any Ten)

10 X 5 = 50 Marks

- 3 Types of Chromosomal aberration induced by radiation
- 4 Write in brief about the different shielding materials used in Radiotherapy
- 5 Differentiate between stochastic and deterministic effect with example.
- 6 Application of Ionization chamber for QA in Radiotherapy department, mention its principle?
- 7 Enumerate Biological effects of radiation and explain the dose limits for each effect
- 8 Principle of Radiation protection.
- 9 Define Radioactivity, flux and fluence with their respective unit.
- 10 Explain in detail the concepts of Workload, use factor, occupancy factor in layout planning
- 11 Define Equivalent dose, Effective dose, Tissue weighting factors and radiation weighting factor
- 12 Calculation for workload in cobalt 60
- 13 Linear and mass attenuation coefficient.
- 14 Explain Photoelectric effect with its particular interactions

SHORT ANSWERS (Answer any Ten)

10 X 3 = 30 Marks

- 15 Equivalent dose.
- 16 Time, Distance and Shielding.
- 17 Properties of X-rays.
- 18 Electron orbit and energy levels.
- 19 Interaction of neutron with matter.
- 20 Effective dose.
- 21 Natural background radiation.
- 22 Dose limits to radiation worker and public.
- 23 Exposure and Half-life
- 24 HVT and TVT
- 25 Kerma and Absorbed dose.
- 26 Ionization and Excitation

* * *



SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH

(A DEEMED TO BE UNIVERSITY)

B.Sc. Allied Health Sciences Second Year (Semester-III)

March 2022 Examination

B.Sc. Radiotherapy Technology (RTT)

Time: 3 Hrs.

[Max. Marks: 100]

Paper-III

Medical Physics

Q.P Code: J3570

Your answers should be specific to the questions asked.

Draw neat labeled diagrams wherever necessary.

LONG ESSAY

2 X 10 = 20 Marks

- 1 Explain the different components of a diagnostic x-ray tube and its functioning?
- 2 Describe the construction of mammography x-ray tube . give a detailed account of mammography procedures.

SHORT ESSAY (Answer any Ten)

10 X 5 = 50 Marks

- 3 How is electrical energy generated and distributed?
- 4 What is focal spot? How does the size of focal spot influence the image resolution?
- 5 Explain about heat production at anode and how is it managed?
- 6 What is a rectifier? What are its uses and Types?
- 7 Explain the Spectrum of X-rays produced from a diagnostic X-ray machine
- 8 What are the qualities of and Ideal target in a X-ray tube? Name at least two materials being used as a Target?
- 9 Draw a neat labelled layout diagram of Diagnostic X-ray unit. What is primary and secondary wall
- 10 C-arm and its applications
- 11 Write about fluoroscopy in detail.
- 12 Method of viewing the intensified image.
- 13 Portable x-ray unit.
- 14 Define Tube current and Tube voltage - How are they controlled

SHORT ANSWERS (Answer any Ten)

10 X 3 = 30 Marks

- 15 Failure of x-ray tube.
- 16 Properties of tungsten material.
- 17 Focal spot test tool.
- 18 Multi section cassette.
- 19 Beam centering device.
- 20 Feeder cables.
- 21 Earthling.
- 22 Cones and grid ratio.
- 23 Tube voltage.
- 24 Step wedge.
- 25 Half-wave rectifier.
- 26 Wisconsin test cassette.

* * *

