SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH

(A DEEMED TO BE UNIVERSITY)

B.Sc. Radiotherapy Technology Second Year Semester-III
February 2020 Examination

Time : 3 Hrs. **[Max. Marks: 100]**

Paper-I

Fundamentals of Physics
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 Write in detail about theory and construction of Transformer and its types with neat diagram.

2 What is rectifier and its types. Explain about it with neat circuit.

SHORT ESSAY (**Answer any Ten)** **10 X 5 = 50 Marks**

3 Photoelectric effect

4 Periodic table

5 Who invented natural radioactivity.? What are alpha, beta and gamma radiations?

6 Define Radioactive equilibrium. What are its types and mention few examples for each.?

7 What are artificial radioactive isotopes. How are they produced?

8 Capacitance, Capacitors and resistance.

9 Factors affecting quality and quantity of x-rays.

10 Explain about Kirchhoff's circuit laws in detail with circuit diagrams.

11 Difference between Half-wave and Full-wave rectifier.

12 Conductivity of electricity through gases at low pressure in an X-ray tube..?

13 What are Bremsstrahlung X-rays? Explain the physics involved in their production and clinical importance?

14 Mention the components of Electromagnetic spectrum and properties of each of its components

SHORT ANSWERS (Answer any Ten) **10 X 3 = 30 Marks**

15 Radium properties

16 Radioactive disintegration law and Ohm's law.

17 Half-life and activity

18 Electric charges and units of electric charge.

19 Thermionic emission.

20 p-n junction diode.

21 Electric potential and potential difference.

22 Properties of X-rays.

23 Florescence and Phosphorescence.

24 Properties of Tungsten

25 Inverse square law.

26 Pair production

* * *

SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH

(A DEEMED TO BE UNIVERSITY)

B.Sc. Radiotherapy Technology Second Year Semester-III
February 2020 Examination

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 the principle of Radiation safety. Explain TDF in detail. Define Equivalent dose, Effective dose, Tissue weighting factors and radiation weighting factor in radiation safety.

2 Describe about the structure of atom.

SHORT ESSAY (Answer any Ten) **10 X 5 = 50 Marks**

3 Explain about Natural background radiation.

4 Compton effect with atomic structure.

5 What is Linear and Mass attenuation coefficient.

6 Explain structure of cell. How does radiation cause cell death? Explain somatic and Hereditary mutations.

7 X-ray spectrum with graph.

8 Write 5 properties of X-rays and explain its production in brief.

9 Direct and indirect effect of radiation.

10 Types of Interaction of X-rays with matter and explain in detail about Pair production.

11 Write a neat labeled diagram of x-ray spectrum and explain its components?

12 What is Survey meter used for ? What is its working principle?

13 Write in detail about Thermoluminescence dosimeter. Also write a neat labeled diagram and mention

14 What are GM counter and Scintillation detector.

SHORT ANSWERS (Answer any Ten) **10 X 3 = 30 Marks**

15 Absorbed dose and exposure.

16 Properties of X-rays.

17 Fluorescence and phosphorescence.

18 Velocity , frequency and wavelength.

19 Contamination monitor.

20 Filters and its types.

21 Somatic effect and hereditary effect.

22 Dose limits to radiation worker and public.

23 Interaction of neutron with matter.

24 HVT and TVT.

25 Proportional counter.

26 Half-life and tenth-life.

* * *

SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH

(A DEEMED TO BE UNIVERSITY)

B.Sc. Radiotherapy Technology Second Year Semester-III
February 2020 Examination

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.

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 What are the uses of electrical energy with proper example?

4 Explain about High Tension(HT) cable.

5 Write briefly about construction and function of Filament circuit in X-ray machine.

6 Use of shunts and fuses.

7 Draw a neat labeled diagram of Rotating anode x-ray tube and name its parts and their function?

8 Mention the types of Filters in X-ray tube. What are their advantages?

9 Name the types of grids used in radiology and mention advantages of each.?

10 Funtion of Potter-Bucky Diaphragm in an X-ray machine?

11 What is the advantage of Image intensifiers and explain its parts with a diagram?.

12 Method of viewing the intensified image.

13 Write about Mobile x-ray unit.Its advantages and disadvantages

14 Explain in detail about parts and functioning of MMR unit.

SHORT ANSWERS (Answer any Ten) **10 X 3 = 30 Marks**

15 Uses of electrical energy

16 Wisconsin test cassette.

17 Focal spot test tool.

18 Multi section cassette.

19 Beam centering device.

20 Feeder cables.

21 Earthling and fuses

22 Cones and grid ratio.

23 Tube voltage and tube current

24 Step wedge.

25 Half-wave rectifier.

26 Ammeter and voltmeter

* * *