SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH

(A DEEMED TO BE UNIVERSITY)

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

March 2021 Examination

B.Sc. Radiotherapy Technology

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 What is Radioactive Equilibrium and discuss about transient and secular equilibrium with examples.

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

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

3 Write about the structure of the atom and Define excitation and ionization.

4 Construction and working of x-rays.

5 Name the different types of interactions of radiation with matter and explain pair production in detail with one clinical application?

6 Conductivity of electricity through gases at low pressure.

7 Explain Nuclear fission and Nuclear fusion - with examples.

8 Define rectifier. What are the types of rectifier and anyone in detail.

9 Factors affecting the quality and quantity of x-rays.

10 Principles of Semiconductors

11 Quantum theory of radiation(Planck's constant)

12 Name different types of radiation interaction with matter and explain about photoelectric effect.

13 Capacitors and insulators.

14 Electromagnetic radiation and its properties.

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

15 Concept of electron volt.

16 Ohm's law and coulomb's law

17 Electric charges and units of electric charge.

18 p-n junction diode.

19 Inverse square law.

20 Electric potential and potential difference.

21 Characteristic X-rays.

22 Properties of tungsten target.

23 Radionuclides used in medicine.

24 Radium properties.

25 Specific gamma ray emission.

26 Properties of X-rays.

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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 Chromosomal aberration and its types with neat diagram. Explain about mutation.

2 Write about structure of atom in detail.

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

3 Photoelectric effect and Compton effects - write their clinical applications

4 Define Workload ,use factor, occupancy factor with relation to radiotherapy bunker construction

5 Different types of shielding materials and their uses.

6 Enumerate the differences between stochastic and deterministic effect.

7 What is filters and explain about its types.

8 What is Ionization chamber, explain with neat diagram.

9 Electromagnetic radiation

10 Explain the philosophy of Radiation protection. Describe the role of Time, distance and shielding

11 Bremsstrahlung x-rays.

12 Scintillation detectors principle, advantage and types.

13 What is TLD and what is used for.? Enumerate the guidelines for use of TLD by Radiation workers

14 X-ray spectrum with graph.

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

15 Dose limits to radiation worker and public

16 Mutation and its types..

17 Natural background radiation

18 Ionization and excitation

19 Equivalent dose.

20 Effective dose.

21 Time, Distance and Shielding..

22 Kerma and Absorbed dose.

23 LD 50/60

24 Acute , sub-acute and chronic effect

25 Deterministic and stochastic effect.

26 Properties of X-rays

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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 Describe various quality assurance gadgets used with x-ray equipment's.

2 Explain the different components of a diagnostic x-ray tube.

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

3 Define Fuses, Circuit breakers, Earthing and Insulation?

4 What is the use of shunts and fuses in an x-ray machine.

5 What are the QA tests for X-ray machine?

6 Write briefly about focal spot? How does its size impact the image quality? What techniques are used to reduce the size of focal spot?

7 Bremsstrahlung x-rays and Charecteristic X-rays

8 Magnification radiography and subtraction radiography

9 Write about fluoroscopy in detail.

10 What is C-arm? Where is it used?

11 Cordless mobile X-ray equipment

12 Subtraction Radiography

13 Factors that influence the quality of X-ray image produced

14 Which meters are commonly found in diagnostic X-ray machine

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

15 Focal spot test tool.

16 Failure of x-ray tube.

17 Beam centering device.

18 Feeder cables.

19 Earthling and Insulation

20 Tube current and Tube voltage.

21 Step wedge.

22 Half-wave rectifier.

23 Write about properties of tungsten and molybdenum

24 Write about properties of x-rays

25 Ammeter and voltmeter

26 Wisconsin test cassette.

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