SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH

(A DEEMED TO BE UNIVERSITY)

B.Sc. Allied Health Sciences Second Year (Semester-III)
April 2023 Examination
B.Sc. Imaging Technology

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

Paper-II

Radiation safety

Q.P Code : J3360

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 the principle of radiation protection and explain about effect of time distance and shielding.

2 Describe about TLD (Thermoluminescence dosimeter) and mention 2 clinical uses other than radiation safety?

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

3 Workload, use factor, occupancy factor and distance.

4 X-ray spectrum with graph.

5 Compton effect with atomic structure.

6 Explain in detail about Linear and Mass attenuation coefficient.

7 Natural background radiation.

8 Characteristic x-rays.

9 Direct and indirect effect of radiation.

10 Types of Interaction of X-rays with matter and explain in detail about photoelectric effect

11 State 5 differences between stochastic and deterministic effects with examples.

12 What is ALARA and write about the role of Time, distance and shielding in radiation safety.

13 Electromagnetic radiation

14 Write in detail about about Radioactive decay. Define half life? Mention half lives of 4 radioactive isotopes

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

15 Absorbed dose and exposure

16 Fluorescence and phosphorescence.

17 Properties of X-rays.

18 Proportional counter

19 Equivalent dose and tissue weighting factor.

20 Velocity , frequency and wavelength

21 Dose limits to radiation worker and public.

22 HVT and TVT

23 GM counter

24 Interaction of neutron with matter.

25 Half-life and tenth-life.

26 Effective dose and radiation weighting factor.

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

B.Sc Imaging Technology (IMT)

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

Paper-III

Medical Physics

Q.P Code : 3370

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 = 30 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 labelled 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 Function 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

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

April 2023 Examination

B.Sc. Imaging Technology

Time : 2.30 Hrs. **Paper – 1** **[Max. Marks : 80]**

Subject: Fundamentals of Physics

Q.P Code : K3330

Your answers should be specific to the questions asked.
Draw neat labelled diagrams wherever necessary.

LONG ESSAY **2 X 10 = 20 Marks**

1. Describe about the structure of atom with neat diagram.
2. Explain about the conductors, insulators and semiconductors in brief.

SHORT ESSAY **6 X 5 = 30 Marks**

3. Define Radioactive equilibrium and explain the two types of equilibrium.
4. Explain in detail about the various method of Cooling method used in X-ray tube.
5. What is a Transformer? Mention the types of transformers?
6. Describe the Quantum theory of radiation(Planck's constant)
7. Explain the Construction and working of x-rays.
8. What are the Properties of Electromagnetic radiation and X-rays.

SHORT ANSWERS **10 X 3 = 30 Marks**

9. Name any three radioactive nuclides and give explain.
10. Write about properties of alpha and beta.
11. Define Inverse square law.
12. Write about properties of Radium.
13. What is meant Florescence and Phosphorescence?
14. Define Rectifier and mention its types.
15. Define Electric charges and its units.
16. Define Half-life and Tenth-life
17. Electric potential and potential difference.
18. Radioactive disintegration law and Ohm's law.

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

April 2023 Examination

B.Sc. Imaging Technology

Time : 2.30 Hrs. **Paper – II**

Subject: Radiation safety **[Max. Marks : 80]**

Q.P Code : K3340

Your answers should be specific to the questions asked.
Draw neat labelled diagrams wherever necessary.

LONG ESSAY **2 X 10 = 20 Marks**

1. What is a chromosomal aberration and explain its type with a neat diagram?
2. Explain the production of Characteristic and Bremsstrahlung X-rays

SHORT ESSAY **6 X 5 = 30 Marks**

3. Write in detail about the Thermoluminescence dosimeter with a neat diagram
4. What is the stochastic and deterministic effect?
5. Write in detail about the philosophy of radiation protection
6. Explain about equivalent dose and effective dose with weighting factors.
7. What is the quality and intensity of x-rays and mention the factors which affect the quality and intensity of x-rays?
8. Write a short note on atomic structure with a neat diagram

SHORT ANSWERS **10 X 3 = 30 Marks**

9. What is the importance of time in radiation protection?
10. What is internal conversion? Give example?
11. Define radiation fluence and flux.
12. What is Half value thickness (HVT) and tenth-value thickness (TVT)?
13. Define half-life. What is the half-life of Co – 60, Ir – 192?
14. What is chromosome and chromatid?
15. What is isomeric transition? Give example
16. Define effective dose with weighting factor
17. Write the working principle of TLD.
18. Write electron interaction with matter

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B.Sc. Imaging Technology

Time : 2.30 Hrs. **Paper – III**

Subject: Medical Physics **[Max. Marks : 80]**

Q.P Code : K3350

Your answers should be specific to the questions asked.
Draw neat labelled diagrams wherever necessary.

LONG ESSAY **2 X 10 = 20 Marks**

1. Explain in detail about the Principle and construction of Image intensifiers.
2. Write in detail about maintenance's of diagnostic X-ray machine with the causes of failure of X-ray tubes?

SHORT ESSAY **6 X 5 = 30 Marks**

3. What is the use of Rotating anode and draw the diagram neatly.
4. Describe the Mobile X-ray unit.
5. Write about the Mammography unit in detail.
6. Explain in detail about the Generation and uses of electrical energy.
7. Define rectifier and explain about the Full - wave rectifier with circuit diagram.
8. What is Grid and mention its types.

SHORT ANSWERS **10 X 3 = 30 Marks**

9. Write a short note of Beam centering device.
10. What is the use of Step-wedge test and mention its tolerance.
11. What is meant Filters and its types?
12. Explain the Test of kilo voltage and timer.
13. Define anode and cathode.
14. Define Cones and grid ratio.
15. Define Tube voltage and tube current.
16. What is meant Fuses and its types.
17. Write a short note of Subtraction Radiography.
18. Explain about the Focal spot test tool.

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