SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH

(A DEEMED TO BE UNIVERSITY)

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

March 2024 Examination

B.Sc Imaging Technology (IMT)

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 Describe about ionization chamber and proportional counter.

2 Interaction of radiation with matter and explain about photoelectric and Compton effect.

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

3 Electromagnetic radiation and its properties.

4 Mutation and its types.

5 Bremsstrahlung x-rays.

6 Pair production.

7 Radiation induced Chromosomal aberrations - mention types and explain with a diagram

8 Write a neat labelled diagram Pocket dosimeter and mention two of its uses.

9 X-ray spectrum with graph.

10 Factors influencing the quantity & quality of X-rays produced

11 What is Workload ,use factor, occupancy factor and distance, explain with examples

12 Characteristic x-rays.

13 Different types of shielding materials.

14 What is Thermoluminescence dosimeter? Name 3 other types of personal monitoring devices?

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

15 Define Power, energy and mass

16 Define Ionization and excitation.

17 What is meant artificial radiation ?

18 Properties of X-rays

19 Somatic and hereditary effect.

20 Effective dose and radiation weighting factor.

21 Dose limits to radiation worker and public.

22 Kerma and Absorbed dose.

23 LD 50/60

24 Filters and its types.

25 Deterministic and stochastic effect.

26 Activity and half-life

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

Paper-III

Medical Physics

Q.P Code: J3370

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 equipments.

2 Principle and construction of Image intensifiers. Mention the function of each layer. Write about the advantages of using intensifiers?

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

3 What are the uses of electrical energy with few examples?

4 Write a neat labelled diagram of X-ray tube and write about the function of each of part?

5 Capacitor discharge mobile equipment

6 Name the factors influencing quality of X-rays and explain them in brief.

7 Explain the parts of X-ray tube and function of each of them?

8 Rectifiers and their role in X-ray production

9 Transformer and its uses

10 Method of viewing the intensified image

11 How is electricity generated? Mention 4 main sources of electricity?

12 What is the disadvantage of using stationary anode in Mobile x-ray unit.How does it influence the heat production, longevity of target and X-ray quality?

13 Properties of X-ray. How is Photoelectric effect important for generating good quality X-ray images

14 What is Mammogram? Procedure and Uses of Mammography

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

15 Wisconsin test cassette.

16 Beam centering device.

17 Conductors and semiconductors

18 Focal spot test tool.

19 Multi section cassette.

20 Cones and grid ratio.

21 Tube current and Tube voltage.

22 Test of kilo voltage and timer.

23 Properties of x-ray

24 Capacitor and insulator

25 Earthling and fuses

26 Step wedge.

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

March 2024 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. What are the factors influencing the quality and quantity of x-rays?
2. Explain in detail about the working of x-ray tube with neat diagram.

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

3. Explain in detail about Characteristic x-rays.
4. What is a Transformer? Mention the types of transformers?
5. Explain in detail about the Principles of nuclear reactor.
6. What is rectifier and its types and explain about Full -wave rectifier with neat diagram.
7. Write in detail about radionuclides used in medicine.
8. Write the properties alpha, beta and gamma rays.

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

9. Explain about pair production.
10. Properties of radium?
11. Explain about the types of Kirchhoff's law.
12. What is meant semiconductors?
13. Define electron volt.
14. Describe the properties of x-rays.
15. Half-life and tenth- life with its relationship
16. Write about Insulator and fuses.
17. Define Potential and kinetic energy with its unit.
18. Write about filament in x-ray.

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B.Sc. Imaging Technology

Time : 2.30 Hrs. **Paper – 2**

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. Write in detail about the scintillation detector and Pocket dosimeter with a neat diagram
2. Write in detail about the interaction of charged particles with matter

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

3. Write in brief about the properties of x-rays.
4. Define the units: Radioactivity, KERMA, and Absorbed Dose
5. Explain the production of bremsstrahlung x-rays
6. Explain Compton scattering.
7. Write in detail about the GM counter with a neat diagram
8. Write in detail about Ring and Dicentric chromosomal aberrations

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

9. Define coherent scattering in photon interaction
10. What is ionization and excitation?
11. Define half-life. What is the half-life of Co – 60, Ir – 192?
12. Define pair production in photon interaction
13. What is the importance of time in radiation protection?
14. What is chromosome aberration?
15. What is artificial radioactivity? Give example.
16. How does the tube current affect the intensity and quality of x-rays?
17. What is alpha decay? Give example.
18. Differentiate stochastic and deterministic effects?

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B.Sc. Imaging Technology

Time : 2.30 Hrs. **Paper – 3**

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 the different components of a diagnostic x-ray tube and its functioning?
2. Describe the various quality assurance gadgets used with x-ray equipment's.

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

3. What is meant Filters and mention its types.
4. Explain about the High Tension (HT) cable.
5. Explain in detail about the Fluoroscopy unit
6. What are the Factors affecting quality and quantity of x-ray.
7. Define rectifier and explain in detail about the Half-wave rectifier with circuit diagram.
8. Write in detail about the Dental x-ray unit.

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

9. Write a short note of Image intensifier.
10. What is meant Earthling and fuses.
11. Write about Grids and its types.
12. Mention the Properties of tungsten and molybdenum.
13. Mention an application of mammography.
14. What are the of uses electrical energy with proper example?
15. Write about Portable x-ray unit.
16. What are the uses of shunts?
17. Write a short note of Multi section cassettes.
18. Write the Properties of x-ray.

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