

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. Imaging Technology

Time: 3 Hrs.

[Max. Marks: 100]

Paper-I

Fundamentals of Physics

Q.P Code: J3350

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 structure and functioning of a Cathode-ray tube with neat diagram
- 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 Write about properties of Radium and uses.
- 4 Define half life? What is the half life of Cobalt-60, Iridium 192, Cesium-137 and Iodine 131
- 5 Name different types of interaction of radiation with matter and explain them briefly.
- 6 Difference between Half-wave and Full-wave rectifier.
- 7 Describe the structure of the atom.
- 8 Transformer and its types.
- 9 Explain Nuclear fusion and Nuclear fusion with examples
- 10 What is a nuclear reactor. Explain the principle of its functioning.
- 11 Photoelectric effect and Compton effect
- 12 What is Thermionic emission? Which material is commonly used as target in X-ray tube? Explain the reasons for using it?
- 13 Characteristic X-rays.
- 14 What is electromagnetic spectrum and Enumerate its components and general properties.?

SHORT ANSWERS (Answer any Ten)

10 X 3 = 30 Marks

- 15 Radioactive displacement law
- 16 Coulomb's law and ohm's law
- 17 Electron volt
- 18 Electric charges and units of electric charge.
- 19 Radionuclides used in medicine
- 20 Florescence and Phosphorescence.
- 21 Inverse square law.
- 22 Electric potential and potential difference.
- 23 Power and velocity and frequency
- 24 Half-life and units of radioactivity.
- 25 Properties of X-rays.
- 26 Mutual induction and self-induction circuits

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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 in detail about thermo-luminescence dosimeter. Write a Neat labelled diagram of TLD badge.
- 2 Write about different types of shielding material and their uses. Mention advantages and disadvantages each of them over the others? Define HVL and TVL....?

SHORT ESSAY (Answer any Ten)

10 X 5 = 50 Marks

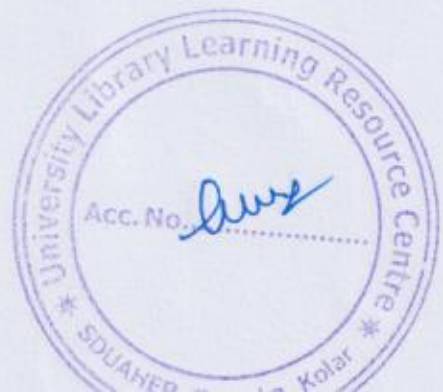
- 3 Ionization chamber - types and uses
- 4 Pocket dosimeter.
- 5 Survey meter and its applications
- 6 Chromosomal aberrations induced by RT and its applications.
- 7 Biological effects of radiation
- 8 Describe stochastic and deterministic effects.
- 9 Elaborate the effects of Radiation during pregnancy?
- 10 Workload, use factor , occupancy factor and distance.
- 11 Radioactivity, flux and fluence with unit.
- 12 Photoelectric effect with atomic structure.
- 13 Linear and mass attenuation coefficient.
- 14 Principle of Radiation protection.

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

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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 Write about half and full wave rectifier.
- 2 Write in detail about Mammography? What material is used as target in mammogram and its advantages?

SHORT ESSAY (Answer any Ten)

10 X 5 = 50 Marks

- 3 Principles and construction of image intensifiers.
- 4 Explain about High Tension (HT) cable.
- 5 Radiographic and fluoroscopic tables.
- 6 Multi section cassettes
- 7 Write briefly about Cine flurography?
- 8 Rapid cassette changer
- 9 Heel effect and its effect on quality of image
- 10 Management of heat generated during X-ray production
- 11 Describe the construction of Image intensifiers.
- 12 Factors affecting quality of x-rays.
- 13 Dental x-ray unit.
- 14 What are the types of filtration that happen in a x-ray tube? Write types of Filters added to enhance the quality of beam?

SHORT ANSWERS (Answer any Ten)

10 X 3 = 30 Marks

- 15 Step wedge.
- 16 Wisconsin test cassette.
- 17 Cones and grid ratio.
- 18 Multi section cassette.
- 19 Beam centering device.
- 20 Feeder cables.
- 21 Failure of HT cable
- 22 Focal spot test tool.
- 23 Tube voltage.
- 24 Failure of x-ray tube.
- 25 Properties of x-rays.
- 26 Insulation and earthing

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