SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH

(A DEEMED TO BE UNIVERSITY)

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

February – 2018 Examination

B.Sc. Imaging Technology (IMT)

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

Paper-I

FUNDAMENTALS OF PHYSICS

Q.P Code : IMT301CC

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. Describe the construction and working of an X-ray tube with neat diagram.

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

3. Properties of Electromagnetic radiation.
4. Describe the structure of the atom.
5. Properties of alpha, beta and gamma radiation.
6. Radioactive equilibrium.
7. Explain about Kirchhoff's law with proper circuit diagram.
8. Capacitance and Capacitors.
9. Mutual induction and Self-induction.
10. Principles of Semiconductors
11. Difference between Half-wave and Full-wave rectifier.
12. Conductivity of electricity through gases at low pressure.
13. Bremsstrahlung X-rays.
14. Cooling method of X-ray tube.

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

15. Production of artificial radioisotopes in nuclear reactor.
16. Radioactive disintegration law and Ohm's law.
17. Half-life.
18. Electric charges and units of electric charge.
19. Thermionic emission.
20. p-n junction diode.
21. Inverse square law.
22. Properties of X-rays.
23. Characteristic X-rays.
24. Filament design in X-ray tube.
25. Florescence and Phosphorescence.
26. Electric potential and potential difference.

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Paper-II

RADIATION SAFETY

Q.P Code : IMT302CC

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

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

1. Explain about the Electromagnetic radiation? Difference between ionizing and non-ionizing radiation?
2. Describe in detail about photo electric effect and Compton effect with its atomic structure.

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

3. Explain about the atomic structure?
4. Difference between bremsstrahlung and characteristic radiation?
5. Linear and mass attenuation co-efficient.
6. Difference between Kerma and absorbed dose?
7. Explain about the natural background radiation?
8. Describe the chemical reaction of DNA with radiation?
9. Photon fluence and its rate.
10. Bremsstrahlung-rays.
11. Different types of shielding materials.
12. Thermo luminescence dosimeter.
13. Explain Personal monitoring devices?
14. Explain about the risk models?

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

15. Write briefly about radiation units.
16. Properties of X-rays.
17. Pair production?
18. Relation between HVT and TVT?
19. Fluence and flux?
20. Philosophy of radiation protection?
21. Use factor and occupancy factor?
22. Explain about theattenuation? Difference between attenuation and absorption.
23. Explain about linear, mass, atomic energy attenuation coefficient.
24. Quality of X-ray.
25. What are isotopes and isobars?
26. What is TLD material? Draw the function of TLD material during the usage?

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Paper-III

Medical Physics

Q.P Code : IMT303CC

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

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

1. What are grids? Write about the mechanism of action, types and its applications with diagrams.
2. Write briefly about generation of electricity and its distribution.

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

3. Explain briefly about rectifiers.
4. What is filament circuit? Explain with diagram.
5. Explain about reciprocating and oscillating mechanism.
6. Write briefly about light beam collimator.
7. Explain about cassettes with diagrams.
8. Write briefly about fluoroscopic screens.
9. What are the methods of viewing the intensified image?
10. Write briefly about the procedure of obtaining radiograph for focal area.
11. Write briefly about high tension cables, construction and cables.
12. Write briefly about mammography.
13. Explain optical centering device.
14. Write briefly about mobile X ray units.

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

15. Write briefly about fuse.
16. Uses of shunts.
17. Uses of rating charts.
18. Speed of anode rotation.
19. Name beam centering devices.
20. Earthling.
21. Meters in diagnostic radiology.
22. Potter bucky diagram.
23. Care of X ray tubes.
24. Wisconsin test tool.
25. Rapid film changer.
26. Insulation.

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