Rajiv Gandhi University of Health Sciences, Karnataka

II Year B.Sc. Radiotherapy Technology Degree Examination – 14-Jan-2022

Time: Three Hours **Max. Marks: 60 Marks**

RADIOTHERAPY (Part– I – A)
FUNDAMENTAL OF PHYSICS
(Revised Scheme-3)
Q.P. CODE: 1356

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

LONG ESSAYS (Answer any Two) **2 x 10 = 20 Marks**

1. Explain different nodes of decay with example.
2. Construction and working of rotating anode X-ray tube.
3. Explain the Radioactive disintegration process and give the properties of alpha beta gamma X-rays.

SHORT ESSAYS (Answer any FIVE) **5 x 5 = 25 Marks**

4. Characteristic x-rays.
5. Full wave rectification.
6. Cooling of x-ray tube.
7. Factors affecting quality of X-ray
8. Line focus principle and heel effect.
9. Inverse Square Law.
10. What are Isotopes, Isomers and Isobars.

SHORT ANSWERS (Answer any FIVE) **5 x 3 = 15 Marks**

11. Thermionic emission.
12. Cyclotron.
13. Half Valve Thickness.
14. Electromagnetic spectrum.
15. Sivert and Gray.
16. Exponential law of attenuation.
17. Cobalt-60.

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II Year B.Sc. Radiotherapy Technology Degree Examination – 17-Jan-2022

Time: 3 Hours **Max. Marks: 30 Marks**

Radiation Biology, Applied Anatomy and Pathology (RS-3)
Q.P. Code : 1357

Your answers should be specific to the questions asked.
Draw neat labeled diagrams wherever necessary
(Note : Both QP Codes 1357 and 1358 are to be answered within total duration of 3 hours)

LONG ESSAYS (Answer any One) **1 x 10 = 10 Marks**

1. Describe in detail the effect of ionizing radiation on cancer cells. Explain in detail the various types of radio sensitive & radio resistant types of tumour
2. Describe in detail the anatomy of brain. Explain in detail the pathology and spread of cancer in a patient with brain tumour

SHORT ESSAYS (Answer any Two) **2 x 5 = 10 Marks**

3. The concept of fractionation in radiotherapy
4. Describe the effect of ionizing radiation DNA
5. Lymphatic supply of uterine cervix

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SHORT ANSWERS (Answer any Five) **5 x 2 = 10 Marks**

6. Hyperthermia
7. Biopsy
8. LET
9. RBE
10. Neutrons
11. Hemoglobin and its importance in radiotherapy

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II Year B.Sc. Radiotherapy Technology Degree Examination – 17-Jan-2022

Time: 3 Hours **Max. Marks: 30 Marks**

Principles of Radiotherapy (RS-3)
Q.P. Code: 1358

Your answers should be specific to the questions asked.
Draw neat, labeled diagrams wherever necessary
(Note: Both QP Codes 1357 and 1358 are to be answered within total duration of 3 hours)

LONG ESSAYS (Answer any One) **1 x 10 = 10 Marks**

1. Write a note on the management of acute and late effects of radiation therapy.
2. Explain clinical signs and symptoms of neoplasia and its management.

SHORT ESSAYS (Answer any Two) **2 x 5 = 10 Marks**

3. Mention the steps involved in the management of acute side effects of radiation therapy.
4. TNM staging in Cancer.
5. Explain briefly about types of brachytherapy.

SHORT ANSWERS (Answer any Five) **5 x 2 = 10 Marks**

6. Types of simulation used in radiation therapy.
7. Importance of image guidance in RT.
8. Side effects of radiation therapy.
9. Explain carcinoma of breast patient positioning for RT.
10. Altered fractionation in radiation therapy.
11. Total body irradiation.

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II Year B.Sc. Radiotherapy Technology Degree Examination – 14-Jan-2022

Time: Three Hours **Max. Marks: 100 Marks**

Radiotherapy - Part – I A (RS-4)

Q.P. CODE: 3285

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

LONG ESSAYS (Second Question Choice) **2 x 10 = 20 Marks**

1. Describe the construction and working or rotating and fixed anode x-ray tube.

2. Explain the principle of semiconductor. Draw circuit diagram of full-wave rectifier and explain in detail.
   OR
   Explain about basic interactions between X-rays and matter.

SHORT ESSAYS (Question No 5 & 10 choice) **10 x 5 = 50 Marks**

3. Describe about Fluorescence and Phosphorescence.
4. Thermionic emission.
5. Explain about parallel and series capacitors.
   OR
   How are artificial radio nuclides produced?
6. Properties of radium and name its daughter products.
7. Radioactive equilibrium.
8. Explain the methods of cooling x-rays tubes.
9. Explain about characteristic and Bremsstrahlung x-ray.
10. Explain the physics of the radiograph.
    OR
    Explain about Ohm's law and Kirchhoff's law.
11. Types of transformers used in X-ray equipment.
12. What are the factors influencing the intensity and quality of X-rays.

SHORT ANSWER **10 x 3 = 30 Marks**

13. Gray.
14. Inverse square law.
15. Rem and Sievert.
16. KERMA.
17. Periodic Table.
18. Basic X-ray circuit.
19. Anode heel effect.
20. Photo disintegration.
21. Half value thickness.
22. Linear Energy Transfer (LET).

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II Year B.Sc. Radiotherapy Technology Degree Examination – 17-Jan-2022

Time: Three Hours **Max. Marks: 50 Marks**

Radiotherapy - Part – I B (RS-4)
Radiation Biology & Applied Anatomy and Pathology

Q.P. CODE: 3286

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

LONG ESSAYS (Answer any one) **1 x 10 = 10 Marks**

1. Discuss the etiology, pathogenesis and staging of head and neck tumors

2. Discuss the multi modality management in cancer patients

5 x 5 = 25 Marks

SHORT ESSAYS (Answer any five)

3. Describe the cell survival curves
4. Discuss the aetiopathogenesis of carcinoma cervix
5. Discuss the dose exposure limits for radiation workers and general public
6. Discuss the stochastic effects of radiation
7. Discuss the radio sensitivities of normal and tumor cells
8. Discuss in detail the characteristics of a Neoplasia

SHORT ANSWER **5 x 3 = 15 Marks**

9. Pocket dosimeter
10. Carcinogens
11. Neoplasia
12. Chromosomal aberrations
13. Brain tumors

II Year B.Sc. Radiotherapy Technology Degree Examination – 17-Jan-2022

Time: Three Hours **Max. Marks: 50 Marks**

Radiotherapy - Part – I B (RS-4)
Principles of Radiotherapy
Q.P. CODE: 3287

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

LONG ESSAYS (Answer any one) **1 x 10 = 10 Marks**

1. Describe pathology and RT technique for Breast cancer patient.
2. Explain in detail about Linear accelerator and its various parts.

SHORT ESSAYS (Answer any five) **5 x 5 = 25 Marks**

3. Symptoms of neoplasia.
4. Acute and late effects of Mediastinal Radiotherapy.
5. Mould roam preparation for tongue cancer patient.
6. Explain clinical signs and symptoms for oesophagus cancer patient.
7. Describe simulation for rectal cancer.
8. Isocentre technique.

SHORT ANSWER **5 x 3 = 15 Marks**

9. Mould Brachytherapy.
10. Hyper Fractionation.
11. Explain multidisciplinary approach.
12. Chemo irradiation.
13. Radiation dermatitis management.

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