Rajiv Gandhi University of Health Sciences, Karnataka

III Year B.Sc. Radiotherapy Technology Examination – 30-May-2024

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

RADIOTHERAPY PART –II – A
Radiation physics (RS -3)
Q.P. CODE: 2915

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. Describe interactions of radiation with matter, and their relevance in Radiotherapy practice.
2. Draw a neat labelled diagram of structure of linear accelerator. Describe the principles and functioning of linear accelerator.
3. Describe principles and functioning of a CT (Computed, Tomography) simulator in Radiotherapy practice.

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

4. Electronic Portal Imaging Device (Principles, Applications, Advantages and Disadvantages).
5. Electron Beam Therapy.
6. Enumerate the differences between Telecobalt and Linear Accelerator.
7. Cerrobend (Composition, Properties, Uses).
8. Bolus Material.
9. Three Dimensional Conformal Radiotherapy (3DCRT).
10. Define Isodose Curves, draw a neat labelled diagram of Isodose distribution of SSD (Source to Surface distance type) of Cobalt 60, enumerate the parameters effecting the Isodose distribution.

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

11. Inverse Square law.
12. Linear energy transfer (LET).
13. Define Roentgen, Grey and Sievert.
14. AERB (Atomic Energy Regulatory Board) dose limitations for Occupational Workers.
15. Vacuum Bag Cushion (Vacloc).
16. SSD and SAD techniques.
17. Define Low, Medium and high dose rate Brachytherapy.

Rajiv Gandhi University of Health Sciences, Karnataka

Third Year B.Sc. Radiotherapy Technology Degree Examination – 30-May-2024

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

RADIOTHERAPY – PAPER – II A (RS-4)

Q.P. CODE: 3288

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. Free air Ionization Chamber
2. Explain the differences between Linear accelerator and Telecobalt machine
   OR
   Describe in detail about somatic effects and hereditary effects of radiation

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

3. Explain about the Semiconductor detectors
4. Explain about the SSD and SAD treatment time calculation in Telecobalt
   Or
   Explain various barrier types included in radiotherapy facility
5. Radiolysis of water
   OR
   Explain about IMRT technique
6. TLD personal monitoring device
7. Pair production
8. Different types of Brachytherapy techniques
9. Explain about TMR? What are the factors affecting TMR?
   Or
   DVH
10. Explain about Wedge. Different types of wedges
    OR
    Explain about MLC
11. Explain about Magnetron in LINAC
12. Different types of source drawer in Telecobalt Radiotherapy

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

13. Exposure
14. Auger electron
15. RBE
    Or
    Radiation enhancers
16. Di-centric chromosome aberrations
17. OSLD
    Or
    Tomotherapy
18. What are the sources used in Brachytherapy?
19. PDD
    Or
    Roentgen & rad
20. Half-life and mean life
21. Effective dose
22. ALARA

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Rajiv Gandhi University of Health Sciences, Karnataka

Third Year B.Sc. Radiotherapy Technology Degree Examination – 03-Jun-2024

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

RADIOTHERAPY – PAPER – II B (RS-4)
Q.P. CODE: 3289

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. Enumerate of combination of Teletherapy and Brachytherapy in management of ca cervix
2. CT simulation and verification with any one quality assurance checks in the management of Ca tongue

   OR

   Different treatment volumes discussed in ICRU

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

3. Post and pre-operative radiotherapy
4. Intraluminal Brachytherapy (ILBT)
5. CT simulation

   OR

   Blood irradiation
6. Conventional fields SSD, SAD and rotation technique
7. Image guided radiotherapy
8. Management of Wilms tumours
9. Systematic error and a random error
10. Cone beam CT and fan beam CT

    OR

    Tomotherapy
11. Respiratory Gating Technique
12. Radio sensitizers and radio protector

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

13. Orthogonal images
14. Digitally Reconstructed Radiograph (DRR)
15. Hospice and terminally ill patient management
16. The professional role of the radiotherapy technologists
17. Contrast administration
18. Vac –lock immobilization
19. Breast board
20. Carbon fibre couch
21. Cobalt source and its properties
22. Electron applicators

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Rajiv Gandhi University of Health Sciences, Karnataka

III Year B.Sc. Radiotherapy Technology Examination – 03-Jun-2024

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

PRINCIPLES & PRACTICE OF RADIOTHERAPY (RS3)
Q.P. CODE: 2916

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

Section – A

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

1. Describe in detail the process involved in radiotherapy planning of a patient with carcinoma cervix. Elaborate the mould room techniques used and simulation techniques used.
2. Describe the principles in the treatment of malignant disease and the relative value of each modality of treatment. Write briefly the radiotherapy of facility for management of cancer patients.

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

3. Emergency in radiotherapy
4. Tobacco and cancer
5. Cell survival curve

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

6. Shield
   Or
   Daily reproduction errors
7. Contouring methods
8. Fluoroscopy
   Or
   TBI
9. IGRT
10. Temozolomide
11. Bone tumors

Section – B

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

12. Discuss the radiation during radiotherapy and the safety of precaution during radiotherapy.
13. Describe the basics of radiation accident preparedness. Describe the role of radiation monitors in management of acute radiation exposure.

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

14. Cancer pain and WHO ladder
15. Play therapy in children
16. Overall survival and disease free survival

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

17. Neutrons
18. Hospice
19. AIDS and cancer
20. Immobilization
21. Importance of record keeping
22. Risk factors for cancer

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Rajiv Gandhi University of Health Sciences, Karnataka

III Year B.Sc. Radiotherapy Technology Examination – 22-Nov-2024

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

RADIOTHERAPY PART – II – A
Radiation physics (RS3)
Q.P. CODE: 2915

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. Describe the principle and functions of a high energy Linear Accelerator Machine.
2. Describe the principle and functions of a HDR Brachytherapy machine and types of source loading techniques.
3. Define Percentage Depth Dose and the factors influences PDD.

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

4. Write a short note on electron beam characteristics.
5. Briefly explain the working principle of EPID and its importance in radiotherapy.
6. Explain the working principle of Thimble type ionization chamber.
7. What are the ICRP60 recommended dose limits for radiation workers and general public?
8. **What is penumbra and explain different penumbras occurred in telecobalt beam.**
9. Explain static and dynamic wedges and their applications.
10. What is CT simulator and why it is used in radiation therapy.

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

11. Explain briefly about TLD.
12. What is HVL and relation between HVL and TVL.
13. **IGRT advantages**
14. Explain any two beam modifying devices.
15. Explain the application of CT and MRI images in Radiotherapy Practice.
16. **ILRT**
17. Write a note on SSD and SAD techniques.

Rajiv Gandhi University of Health Sciences, Karnataka

Third Year B.Sc. Radiotherapy Technology Degree Examination – 22-Nov-2024

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

RADIOTHERAPY – PAPER – II A (RS-4)
Q.P. CODE: 3288

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. Discuss on various QA procedure in teletherapy unit
2. Enumerate on SRS/SRT
   OR
   Discuss on TMR, TPR TAR and PDD

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

3. Chromosomal aberrations
4. Compton scattering
5. **Scintillation counter**
   OR
   Beam modifying devices
6. Translation and rotational errors in IGRT
7. ICRP recommendation for dose limits
8. IMRT
9. Free air ionization chamber and its limitations
10. Effective dose and equivalent dose
    OR
    Designs of multileaf collimators
11. **Tomotherapy**
12. Tissue compensators

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

13. **Photodynamic therapy**
14. Early effects of radiation
15. Hyperthermia
16. Low melting alloy
17. Emergency procedures in radiotherapy
18. Safety Interlock systems
19. Definition of different target volume and its significance
20. **Radiologic film types**
21. Field matching
22. Immobilization devices

Rajiv Gandhi University of Health Sciences, Karnataka

III Year B.Sc. Radiotherapy Technology Examination – 25-Nov-2024

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

PRINCIPLES AND PRACTICE OF RADIOTHERAPY (RS3)
Q.P. CODE: 2916

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

Section – A

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

1. How will you plan a case of medulloblastoma in an adult with craniospinal irradiation?
2. Describe mantle field technique, its clinical use, preparation of blocks and treatment execution.

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

3. HDR versus LDR in Brachytherapy.
4. Four field box technique.
5. Electron cut-out making

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

6. Surface mould in Brachytherapy.
7. Front pointer use in teletherapy.
8. PTV.
9. MLC.
10. Blood irradiation.
11. SSD technique.

Section – B

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

12. What are the rehabilitation programs for cancer patients? Enumerate in a case of ca larynx with tracheostomy.
13. Enumerate the problems encountered while treating paediatric patients. Describe the management of a child with wilms tumor with radiotherapy under anaesthesia.

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

14. Write about cardiopulmonary resuscitation procedures.
15. Play therapy in children.
16. Institutional review board.

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

17. SRS.
18. Support groups in cancer care.
19. Randomization in clinical trials.
20. Radiotherapeutic emergencies.
21. Bolus.
22. Extracorporeal irradiation.

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Correction 25.11.2024 Morning

Q.P Code: 2916

Read the question No. 5as

5. Electron cut-out making

Rajiv Gandhi University of Health Sciences, Karnataka

Third Year B.Sc. Radiotherapy Technology Degree Examination – 25-Nov-2024

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

RADIOTHERAPY – PAPER – II B (RS-4)
Q.P. CODE: 3289

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. Discuss the management of Carcinoma Breast – Stage III
2. Explain in detail about the role of Radiotherapy technologist in medico-legal and ethical aspects
   OR
   Explain the process of CT simulation for IMRT. What are the mould room techniques used for patient positioning for IMRT of Brain tumor?

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

3. Discuss about professional role of radiotherapy technologist in Oncology
4. Gamma knife
5. Tomotherapy
   OR
   Cyberknife
6. Brief about the steps involved in Psychosocial management of cancer patients.
7. Radio sensitizers and Radio protectors with examples
8. Steps involved in preparing the patient for Brachytherapy
9. Radiotherapy management of Pediatric tumors
10. What is Quality Assurance? Explain in detail two QA tests
    OR
    Importance of Bladder protocol while treating Ca. Cervix cases
11. Image Guided Radiotherapy (IGRT)
12. Total Body Irradiation (TBI)

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

13. CPR
14. Thermoplastic mould
15. Stress management
16. Brachytherapy
17. Cerrobend
18. TNM staging
19. EPID
20. Beam defining devices
21. 3DCRT
22. Beam modifying devices

Correction 25.11.2024 Morning

Q.P Code: 3289

Read the question No. 6as

6. Brief about the steps involved in Psychosocial management of cancer patients.

Read the question No. 17 as

17. Cerrobend