Rajiv Gandhi University of Health Sciences, Karnataka

III Year B.Sc. Radiotherapy Technology Examination – 03-Jan-2022

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 the structure of a linear accelerator with a neat labelled schematic diagram. Elaborate the design and construction of bunker for a Linac installation.
2. Discuss about different techniques of treatment simulation.
3. Enumerate the steps of execution of External Beam Radiotherapy in a patient. Define Image Guided Radiotherapy (IGRT), elaborate the different means of image guidance.

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

4. Thimble Chambers.
5. Stereotactic Radiotherapy.
6. Explain positioning and immobilisation, protocol and simulation for Radiotherapy of Carcinoma of uterine cervix.
7. Volumetric modulated arc therapy.
8. Personal monitoring devices.
9. Conventional Radiotherapy simulator.
10. Cobalt 60 (Decay pattern, half life and therapeutic applications).

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

11. Stochastic effects of Radiation.
12. AERB (Atomic Energy Regulatory Board) dose limitations for general public and radiation worker.
13. Penumbra.
14. Wedges.
15. Characteristic X Rays
16. Bragg peak.
17. Pair production.

Rajiv Gandhi University of Health Sciences, Karnataka

III Year B.Sc. Radiotherapy Technology Examination – 05-Jan-2022

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 the patient methods of beam localization in radiotherapy indicating their relative advantages.
2. Describe the clinical application of total body irradiation treatment.

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

3. Biopsy procedure and methods
4. Radiation protectors
5. Wedges

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

6. MLC
7. Late effects of radiation
8. Mantle field
9. IMRT
10. Hormonal therapy in breast cancer
11. Isocentric treatment

Section – B

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

12. Discuss the various rehabilitation programmers for cancer patients.
13. Describe the various fractionation schedules in radiotherapy and its rationale.

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

14. QA in LINAC
15. Cranial Prophylaxis
16. Tracheostomy care

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

17. Forest plot
18. Hemangioma
19. Steps involved in formulation of a research study
20. WILMS tumor
21. Oxygen effect
22. Cisplatin

Rajiv Gandhi University of Health Sciences, Karnataka

III Year B.Sc. Radiotherapy Technology Examination – 05-Jul-2022

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 various steps involved in treatment planning of IMRT.
2. Explain the classification of Brachytherapy units.
3. Describe the principle and function of a Telecobalt machine and explain source shutter mechanisms.

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

4. Write a note on workload, use factor and occupancy factor.
5. Various methods used for accuracy and reproducibility of hypofractionated radiotherapy.
6. What is Brachytherapy and what are the physical characteristics of sources used in HDR Brachytherapy.
7. Write about beam modifying devices.
8. Discuss conventional simulator and its uses.
9. How can you minimize radiation exposure to public and radiation worker in a radiotherapy department?
10. Explain the principles of scintillation detector.

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

11. Explain immobilization.
12. What is bolus and its application.
13. Explain Total Body Irradiation.
14. Discuss briefly about multi leaf collimator.
15. Briefly explain gamma zone monitor.
16. What is ALARA principle?
17. Shielding materials used in radiation therapy.

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Rajiv Gandhi University of Health Sciences, Karnataka

III Year B.Sc. Radiotherapy Technology Examination – 07-Jul-2022

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. Image guided radiotherapy and its error analysis technique.
2. Role of radiotherapy technologist in the planning process and treatment of Ca Prostate.

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

3. Immobilization devices.
4. Intra Operative Radiation Therapy (IORT).
5. Radio sensitizers.

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

6. Use of blood counts.
7. Table shift method.
8. Monitor units.
9. Cisplatin.
10. Cancer Pain management.
11. Conventional simulator.

Section – B

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

12. Radiation accident preparedness and role of radiation monitors in acute radiation exposure.
13. Discuss about various rehabilitation programmes for cancer patients.

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

14. Emergency procedures during "source stuck" in telecobalt unit.
15. Management of patient with Tracheostomy.
16. Sedation and safety during pediatric patients.

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

17. Protons.
18. Safety measure during IMRT treatment.
19. Radioactive waste management.
20. Complimentary therapies.
21. Non discriminatory practice.
22. Importance of image fusion algorithm.

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Rajiv Gandhi University of Health Sciences, Karnataka

III Year B.Sc. Radiotherapy Technology Examination – 12-Dec-2022

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. Explain the three types of gas filled detectors.
2. Define PDD and TAR and explain the factors which influence them.
3. Explain the different steps involved in planning a 3DCRT.

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

4. Explain stochastic and non-stochastic effects.
5. What are the factors to be considered when constructing a teletherapy bunker?
6. What are isodose curves and describe the factors which influence them?
7. Write about the different beam modifying devices.
8. Explain relationship between Kerma and absorbed dose.
9. What are the factors involved in treatment time calculation for a telecobalt machine?
10. Write a brief note on IMRT.

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

11. ALARA
12. Thermoplastic devices
13. Penumbra
14. Primary and secondary collimator
15. HDR and LDR
16. Inverse square
17. Compton effect

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Rajiv Gandhi University of Health Sciences, Karnataka

III Year B.Sc. Radiotherapy Technology Examination – 14-Dec-2022

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. Conventional RT planning for T1 Ca vocal cord.
2. SRS/SRT and EBRT discuss in details.

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

3. Difference between CT simulator and diagnostic CT.
4. Steps involved in radiotherapy planning for Seminoma.
5. Boost treatment for Ca Breast using Brachytherapy.

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

6. ISBT.
7. Autoradiograph in Brachytherapy.
8. DRR.
9. Cone beam CT.
10. Surface mould.
11. Use of gamma zone monitors in a radiation facility.

Section – B

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

12. Detail process CT simulation for 3D CRT, Mould room techniques used for patient positioning for 3D CRT of ca Esophagus.
13. Explain Palliative care of adult cancer patient and importance of cancer planning and follow up.

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

14. Importance of mouth bite and its care.
15. Steps in 3D CRT (Field in Field technique) for Ca Breast.
16. Explain the aseptic technique used in OT to prevent infection.

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

17. Bolus and its importance.
18. Care of appointments and management in the waiting area.
19. Power break down procedure during treatment.
20. Monitoring patients during radiotherapy.
21. Nutritional advice for patients on radiotherapy.
22. Differentiate between verbal and non verbal communication.

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Rajiv Gandhi University of Health Sciences, Karnataka

Third Year B.Sc. Radiotherapy Technology Degree Examination – 12-Dec-2022

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. Draw a linear accelerator and explain its parts in detail
2. Describe the various interaction of x-rays with matter
   OR
   Describe the definition of different volumes and its significances

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

3. Explain the types of transformers used in x-ray equipments
4. Difference between 3 DCRT and conventional radiotherapy
5. The Geiger Muller Counter
   OR
   Cone Beam CT
6. Port films
7. Adaptive radiotherapy
8. Penumbra
9. Write a note on IMRT
10. Write in brief about remote and manual after loading Brachytherapy
    OR
    Isocentric setup
11. Discuss steps taken to minimize radiation exposure to public and radiation workers in a RT department
12. Moving field technique

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

13. Systemic and random errors
14. ALARA
15. Breast cone
16. Thermoplastic mould
17. Bolus
18. TLD
19. Characteristic X-rays
20. Pocket Dosimeter
21. Tomotherapy
22. Wedges

Rajiv Gandhi University of Health Sciences, Karnataka

Third Year B.Sc. Radiotherapy Technology Degree Examination – 14-Dec-2022

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. Discuss the management of Ca cervix – stage 3
2. Explain the process of CT simulation for 3DCRT. What are the mould room techniques used for patient positioning for 3DCRT of bone tumour

   OR

   Explain in detail about the role of radiotherapy technologist in medico legal and ethical aspects

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

3. Importance of statistical data maintenance in radiotherapy
4. Explain the aseptic techniques used in OT to prevent infection
5. Hospice

   OR

   Fiducials in SBRT
6. Radio sensitizers and radio protection
7. Steps involved in research and publication
8. Steps involved in preparing the patient for Brachytherapy
9. Role of effective communications among staffs in radiotherapy
10. Advantages and challenges of image guided radiation therapy

    OR

    Bladder protocol and its importance
11. Describe the various types of Brachytherapy techniques
12. Particle beam radiotherapy

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

13. Tomotherapy
14. Wedges
15. Oxygen effect
16. Data handling
17. Gamma knife
18. Stress management of cancer patient
19. Brachytherapy sources
20. Cell survival cure
21. TNM staging
22. EPID