# Rajiv Gandhi University of Health Sciences, Karnataka

**III Year B.Sc. Radiotherapy Technology Examination – 13-May-2025**

**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. Discuss in detail the various gas-filled detector. Write a note on TLD.
2. Explain the functioning of a LINAC. What are its advantages over tele cobalt units?
3. **Explain the production of X-rays in a LINAC machine**

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

4. Principles of filtration and beam definition
5. Geiger muller counter
6. Safety issues in Brachytherapy unit
7. ICRP recommendations and limits
8. Isocentric technique
9. Image guided radiotherapy
10. Concept of monitoring unit (MU)

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

11. Tomotherapy
12. Monthly QA in LINAC
13. Breast cone
14. Target Volume
15. HVT
16. Stochastic and deterministic effects
17. GRID

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# Rajiv Gandhi University of Health Sciences, Karnataka

**Third Year B.Sc. Radiotherapy Technology Degree Examination – 13-May-2025**

**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 interaction of radiation with matter**
2. Enumerate on parts of LINAC with block diagram
   **OR**
   Discuss on scintillation detectors

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

3. **TLD**
4. Beam Direction Devices
5. Penumbra and its types
   **OR**
   Percentage depth dose
6. Total Body Irradiation
7. Conventional simulator
8. **KERMA and ABSORBED DOSE and its relation**
9. **Stochastic Vs Deterministic effects**
10. **IGRT**
    **OR**
    Principles of dosimeters
11. **Use of radioactive nuclides in Brachytherapy**
12. Non Isocentric technique and Isocentric technique

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

13. Work load
14. Output factor
15. Data record and transfer
16. Electron beam therapy
17. Target design of X-ray production in LINAC
18. Safety Interlocks
19. LASERS
20. Phantom materials
21. Flatness and symmetry
22. Maze wall

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# Rajiv Gandhi University of Health Sciences, Karnataka

**III Year B.Sc. Radiotherapy Technology Examination – 15-May-2025**

**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. What are the metastatic work up in a case of Cancer of Breast? Write about Radiotherapeutic management of ca breast after breast conservative surgery.
2. Write about Radiotherapeutic management of a case of cancer of Nasopharynx.

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

3. SAD technique.
4. Methods to reduce small intestinal dose during Teletherapy.
5. **Port filming and isocenter verification**

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

6. Radioprotectors.
7. Bladder protocol during teletherapy.
8. V20 of lung.
9. Set up error.
10. DVH.
11. Breast cone.

**Section – B**

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

12. What is IGRT? Write about techniques of IGRT and its clinical uses.
13. Enumerate the psychological problems faced by a Breast cancer patient and the importance of counseling and support groups in them.

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

14. Radioactive source disposal.
15. **IMRT**
16. **Role of effective combination**

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

17. **CPR**
18. Gamma knife.
19. Phases of clinical trials.
20. Uses of electrons in teletherapy.
21. Ethical issues in end of life care.
22. Role of AERB in radiation safety.

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# Rajiv Gandhi University of Health Sciences, Karnataka

## Third Year B.Sc. Radiotherapy Technology Degree Examination – 15-May-2025

**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 Head and Neck tumors (Example Ca. Buccal Mucosa)
2. Explain the process from simulation to treatment for Stereotactic Radiotherapy (SRT)

   **OR**

   Explain in detail about the importance of patient positioning, immobilisation, daily reproduction of the patient's undergoing Radiotherapy

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

3. Steps involved in CT simulation
4. Gamma knife
5. IGRT

   **OR**

   Tomotherapy
6. Cyberknife
7. Radiotherapy management of Brain tumors
8. Steps involved in preparing the patient for Brachytherapy
9. Counselling skills in Oncology
10. Radio sensitizers and Radio protectors

    **OR**

    Importance of Bladder protocol while treating Ca. Rectum cases
11. **Brief about the steps involved in psychosocial management of cancer patients**
12. Discuss about professional role of Radiotherapy Technologist

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

13. Hospice
14. MLC
15. Sources used in Brachytherapy
16. Cerroband
17. Consent of the Patient
18. Beam modifying devices
19. Wedges
20. EPID
21. TNM staging
22. CPR

# Rajiv Gandhi University of Health Sciences, Karnataka

## Third Year B.Sc. Radiotherapy Technology Degree Examination – 27-Oct-2025

**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. **Explain the procedure and applications of interstitial brachytherapy in carcinoma cervix**
2. What is image guided radiation therapy? Briefly describe the IGRT techniques

   **OR**

   Discuss in detail regarding the structural shielding for linear accelerator machine installation for radiation protection

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

3. Describe the motion management techniques in radiotherapy
4. Multi leaf collimators
5. Arc therapy

   **OR**

   Discuss about source driving mechanisms in Teletherapy machine
6. Cyberknife
7. Draw typical layout diagram for 15 MV bunker
8. What is Cerrobend alloy and its used in radiotherapy?
9. Draw decay scheme of Co-60
10. Precautions to be taken during dispensing of radioactive sources

    **OR**

    Write shortly on difference between Linear accelerator and Telecobalt machines
11. Define Photoelectric, Compton effect, pair production and annihilation
12. Write about filters used in linear accelerators

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

13. Simulataneous intergrated boost
14. Define isocenter
15. Superficial X-ray therapy
16. Modes of cell death after radiation
17. Define virtual SSD
18. What are all common shielding materials and its density?
19. Define Kerma
20. Define Roentgen
21. Define controlled area and supervised area
22. What is FFF beam and its uses?

# Rajiv Gandhi University of Health Sciences, Karnataka

## Third Year B.Sc. Radiotherapy Technology Degree Examination – 29-Oct-2025

**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 breast
2. Enumerate different radiotherapy techniques for ca oesophagus
   **OR**
   Explain steps involved in IGRT of brain tumours

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

3. **Management of lung cancer**
4. Importance of MRI in simulation
5. Emergency preparedness in LINAC
   **OR**
   Different imaging protocols for patient setup verification
6. Customized beaming shaping in 3D CRT
7. Intra Operative Radiotherapy (IORT)
8. Altered fractionation
9. Mould in Brachytherapy
10. Stereotatic Radio Surgery (SRS)
    **OR**
    Particle beam therapy
11. Total Body Irradiation (TBI)
12. Curative and palliative treatment

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

13. Re-irradiation
14. MLC
15. Consent of the patient
16. **Port filming and isocenter verification**
17. **Daily patient setup errors**
18. Counselling skills
19. **SSD and SAD**
20. **CyberKnife**
21. Non-discriminatory practice
22. **Benign tumours treated using radiotherapy**

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Rajiv Gandhi University of Health Sciences, Karnataka

# RGUHS THEORY EXAMINATION OCT-2025

## NODAL CENTRE:LAXMI MEMORIAL COLLEGE OF NURSING

**Date:29.10.2025** **Session: MORNING**

# CORRECTIONS

**Subject: RADIOTHERAPY PART-II B**

**QP Code: 3289**

| Q. No | QUESTION Appeared As | QUESTION CORRECTED As | REASON FOR CORRECTIONS |
|---|---|---|---|
| 3 | Management of prostate cancer | Management of lung cancer | Curriculum alignment |
| 16 | Port films | Port filming and isocenter verification | In correct question |
| 17 | Artifacts in imaging | Daily patient setup errors | Curriculum alignment |
| 19 | 6D couch | SSD and SAD | REPEATED QUESTION |
| 20 | Gamma knife | CyberKnife | REPEATED QUESTION |
| 22 | Benign tumours | Benign tumours treated using radiotherapy | Incorrect question |