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Rajiv Gandhi University of Health Sciences, Karnataka

III Year B.Sc. Radiography Degree Examination – April 2014

Time: Three Hours **Max. Marks: 80 Marks**

PHYSICS OF RADIOTHERAPY AND EQUIPMENT

Q.P. CODE: 2207

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. Write principle, advantages and disadvantage of mega voltage X – ray machine and write a note on the various specialized treatments that can be done using this equipment
2. What are the various interaction of radiation with matter? Explain in detail about photoelectric absorption and pair production
3. Explain in detail about brachytherapy. What are the various system available and write about HDR brachytherapy and LDR brachytherapy

SHORT ESSAYS **8 x 5 = 40 Marks**

4. Productive material and room design for radiation protection of therapy installation
5. TLD
6. Air, surface, depth doses and factors affecting them
7. Geiger – muller counter
8. Portal imaging
9. Production of artificial radioisotopes
10. Field combination and treatment planning
11. Care and custody of small sealed radioactive sources

SHORT ANSWERS **10 x 2 = 20 Marks**

12. The roentgen and rad
13. Isodose curves
14. Compensating filters
15. Inverse square law
16. Survey meters
17. Gamma ray constant
18. Radioactive equilibrium
19. Shielding
20. CT simulator
21. SSD and SAD

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Rajiv Gandhi University of Health Sciences, Karnataka

III Year B.Sc. Radiography Degree Examination – April 2014

Time: Three Hours **Max. Marks: 80 Marks**

RADIOTHERAPY, ONCOLOGY & TECHNIQUES (Revised Scheme)

Q.P. CODE: 2208

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 Radiotherapy Fractionation schedules and rationale. What are the schedules used in Teletherapy and Brachytherapy of Cancer Cervix?
2. Describe in detail the process of CT simulation for 3D conformal radiotherapy. What are the mould room techniques used for patient positioning for 3DCRT of Bone tumor?
3. Define Cancer, causes of Cancer and various modalities of Cancer treatment. Describe Radiotherapy and various types of radiotherapy machines.

SHORT ESSAYS (Answer any Eight) **8 x 5 = 40 Marks**

4. Mould room
5. Virtual simulation technique
6. Wedges
7. 3DCRT
8. Emergencies in radiotherapy
9. Staging of cancer
10. Normal structure of importance and avoidance in radiotherapy of head and neck cancer
11. Brachytherapy of cancer cervix
12. Radiation safety of patients and personnel during radiotherapy in Telecobalt machine
13. List-out the radiosensitive and radiation resistant tumors.

SHORT ANSWERS **10 x 2 = 20 Marks**

14. Rapid arch
15. Paediatric radiotherapy
16. Brachytherapy
17. IGRT
18. PET CT Scan
19. ALARA
20. Radioactive isotopes used in radiotherapy
21. Linear accelerators
22. RBE
23. Stochastic effect

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2209_9999_9_S154

Rajiv Gandhi University of Health Sciences, Karnataka

III Year B.Sc. Radiography Degree Examination – April 2014

Time: Three Hours **Max. Marks: 80 Marks**

IMAGING TECHNIQUE INCLUDING US / CT/ MRI / NUCLEAR

Q.P. CODE: 2209

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 various generations of CT scanners. Discuss the artifacts seen commonly in CT images.
2. Describe basic ultrasound circuit and discuss the various ultrasound display modes.
3. Discuss any two –pulse sequences commonly used in MRI.

SHORT ESSAYS (Answer any Eight) **8 x 5 = 40 Marks**

4. Inversion recovery pulse sequence.
5. Radiofrequency coil.
6. Multihole collimator.
7. 2D and 3D images.
8. Positron emission Tomography.
9. Grey scale ultrasound.
10. Ferromagnetic contrast agent.
11. USG transducers.
12. Rectilinear scanner.

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SHORT ANSWERS **10 x 2 = 20 Marks**

13. CT window level and width.
14. Cavitation effect of ultrasound.
15. Specific activity.
16. Shim coil.
17. Precession.
18. Pulse repetition frequency.
19. Resonant frequency.
20. Linear array transducers.
21. Pitch in helical CT.
22. Free induction decay.

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Rajiv Gandhi University of Health Sciences, Karnataka

III Year B.Sc. Radiography Degree Examination – April 2014

Time: Three Hours **Max. Marks: 80 Marks**

RADIOGRAPHIC TECHNIQUES – II

Q.P. CODE: 2210

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. Write in detail about excretion urography.
2. Discuss the technique of percutaneous trans-hepatic cholangiography.
3. List out the emergency equipments used in the radiology department.

SHORT ESSAYS (Answer any Eight) **8 x 5 = 40 Marks**

4. PTC
5. Peripheral venography
6. Sialography
7. Ten day rule in radiation protection
8. High KV technique
9. Macro radiography
10. Chiba needle
11. Nephrostomogram
12. Use of digital substraction
13. Tomography

SHORT ANSWERS **10 x 2 = 20 Marks**

14. Asepsis
15. Pressure injector
16. Mammography
17. Sonogram
18. Fistulography
19. Non-ionic contrast media
20. Scout view
21. Emergency drugs
22. Compression band
23. Barium swallow

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Rajiv Gandhi University of Health Sciences, Karnataka

III Year B.Sc. Radiography Degree Examination – September 2014

Time: Three Hours **Max. Marks: 80 Marks**

PHYSICS OF RADIOTHERAPY AND EQUIPMENT

Q.P. CODE: 2207

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 photon and electron beam transport methods in linear accelerator.
2. Describe in detail the interaction of X and gamma rays with matter
3. What is Brachytherapy. Describe the different implantation techniques used in Brachytherapy

SHORT ESSAYS **8 x 5 = 40 Marks**

4. Explain the principle and working of thimble ionization chamber
5. What are the ICRP 60 recommended dose limits for radiation workers and general public?
6. Explain about beam modifying devices
7. What is penumbra? Explain the different penumbras occurred in telecoblat beam.
8. What is mean by personnel monitoring and area monitoring.
9. Explain about GTV,CTV,PTV and OAR
10. Explain static and dynamic IMRT techniques
11. Explain about single field, parallel oppose and multiple field planning technique. Discuss the advantages of multiple field technique.

SHORT ANSWERS **10 x 2 = 20 Marks**

12. Half-life and mean life
13. Exposure
14. Early effects and late effects
15. ALARA
16. Superficial X-ray
17. Application of photographic film in radiotherapy
18. Give the examples of in vivo dosimeters used in radiotherapy
19. Specific activity
20. Isocenter
21. Phantom

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Rajiv Gandhi University of Health Sciences, Karnataka

III Year B.Sc. Radiography Degree Examination – September 2014

Time: Three Hours **Max. Marks: 80 Marks**

RADIOTHERAPY, ONCOLOGY & TECHNIQUES (Revised Scheme)

Q.P. CODE: 2208

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 the use of phantom in clinical dosimetry.
2. Discuss the process of ionization and excitation.
3. Discuss treatment of carcinoma cervix.

SHORT ESSAYS (Answer any Eight) **8 x 5 = 40 Marks**

4. Briefly write about Grenz ray therapy.
5. What is immobilization? Why is it necessary in radiotherapy?
6. Discuss the differences between film badge and TLD in radiation safety.
7. Discuss various treatment modalities in tele and brachytherapy.
8. Briefly write about the quality assurance checks carried out in a tele-cobalt unit.
9. Discuss Decay constant. Where is it useful in radioactivity?
10. Explain treatment technique for head and neck cancer.
11. What are various radioisotopes used in therapy?
12. Explain "JOB" in radiation safety of Radiology.
13. Discuss transformers used in x-ray machines.

SHORT ANSWERS **10 x 2 = 20 Marks**

14. How cancer is diagnosed?
15. What is use of Iridium – 192 in radiotherapy?
16. Narrate stages of cancer.
17. Define ALARA principle.
18. Briefly write about the quality assurance in CT-Scan.
19. What is grid?
20. What is usefulness of imaging in Radiation Therapy?
21. Define timers in radiotherapy.
22. What are the contract media used in imaging for radiotherapy?
23. Define lead protective shield.

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III Year B.Sc. Radiography Degree Examination – September 2014

Time: Three Hours **Max. Marks: 80 Marks**

IMAGING TECHNIQUE INCLUDING US / CT/ MRI / NUCLEAR

Q.P. CODE: 2209

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 in detail about single photon emission tomography
2. Principles of MDCT
3. MR Spectroscopy

SHORT ESSAYS (Answer any Eight) **8 x 5 = 40 Marks**

4. Second generation of CT Scanner
5. MR angiography
6. Advantages of ultra sound images
7. Image artifacts
8. PET advantages
9. Procedure in C T guided lung biopsy
10. Field of view
11. Xenon gas ionization chambers
12. Perfusion imaging

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SHORT ANSWERS **10 x 2 = 20 Marks**

13. Diffusion
14. Streak artifacts in CT
15. CT numbers
16. Window width and window level
17. MRCP
18. Renal isotope scanning
19. Piezo electric effect
20. Ultra sound contrast media
21. Contra indication of MRI
22. Color doppler

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Rajiv Gandhi University of Health Sciences, Karnataka

III Year B.Sc. Radiography Degree Examination – September 2014

Time: Three Hours **Max. Marks: 80 Marks**

RADIOGRAPHIC TECHNIQUES – II

Q.P. CODE: 2210

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 ERCP in detail.
2. Radiation safety in radiology
3. Describe the small bowel enema.

SHORT ESSAYS (Answer any Eight) **8 x 5 = 40 Marks**

4. HSG
5. Contrast media
6. Percutaneous renal puncture
7. DSA
8. Foreign body localization
9. Transfemoral artereography
10. Retrograde urethrography
11. Types of catheters
12. Sieldinger technique
13. Aortography

SHORT ANSWERS **10 x 2 = 20 Marks**

14. Barium swallow
15. MR contrast media
16. Routes of contrast administration in CT
17. AERB
18. Infusion pyelography
19. Two contraindication for ureteric compression band
20. Miniature radiography
21. Ventriculography
22. Renal arteriography
23. Arthrography

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