Rajiv Gandhi University of Health Sciences, Karnataka

II Year B.Sc. Imaging Technology Degree Examination – 29-May-2024

Time: Three Hours | Max. Marks: 40 Marks

Physics of Radiology – (RS-3)

Q.P. Code: 1353

Your answers should be specific to the questions asked.
Draw neat, labeled diagrams wherever necessary
(Note: Both QP Codes 1353 and 1354 are to be answered within total duration of 3 hours)

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

1. Discuss the construction and working of a modern X-ray tube.
2. Discuss the factors affecting the X-ray beam Quality and Intensity.

SHORT ESSAYS (Answer any Three) — 3 x 5 = 15 Marks

3. Photoelectric effect and Compton scattering
4. Electromagnetic induction
5. Fluorescence and Phosphorescence
6. Rectification

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

7. Liner attenuation coefficient
8. AC transformer
9. Ohm's law
10. Inverse square law
11. Half life
12. Properties of alpha radiation

II Year B.Sc. Imaging Technology Degree Examination – 29-May-2024

Time: 3 Hours | Max. Marks: 40 Marks

Physics of Radiology – (RS-3)

Q.P. Code : 1354

Your answers should be specific to the questions asked.
Draw neat labeled diagrams wherever necessary
(Note : Both QP Codes 1353 and 1354 are to be answered within total duration of 3 hours)

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

1. Outline the relevant factors related to protection of staff and public from radiation including the protection provided by the manufacturer in the X-ray machine.
2. a) Explain in detail how scattered radiation can be controlled.
   b) Write in detail on beam centering devices and light beam collimators.

SHORT ESSAYS (Answer any Three) — 3 x 5 = 15 Marks

3. Explain the line focus principle.
4. Write about interlocking circuits present in x-ray tubes.
5. What is grid? Describe the types of grids.
6. Uses of spinning top and step wedge.

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

7. What is filtration in x-ray tube?
8. Brief about self rectification
9. How Workload is calculated for an x-ray unit?
10. Examples of stochastic and non-stochastic effects
11. What is anti-scatter grid?
12. What do you mean by 'doubling dose'?

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Rajiv Gandhi University of Health Sciences, Karnataka

Second Year B.Sc. Medical Imaging Technology Degree Examination – 29-May-2024

Time: Three Hours | Max. Marks: 100 Marks

Radiation Physics: Medical Physics and Radiation Safety in Radio Diagnosis (RS-4)

Q.P. CODE: 3290

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 in detail about construction of digital fluoroscopy
2. Write a note on structural shielding design in diagnostic radiology
   OR
   Describe in detail about the components in x-ray generator with neat diagram

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

3. Line focus principle.
4. Rectifiers.
5. HT Generators.
   OR
   Image intensification.
6. Ionization chamber.
7. Biological effects.
8. Air gap techniques.
9. Losses of transformer.
10. Space charge compensation.
    OR
    Anode heel effect.
11. Radioactive decays.
12. Switches and circuit breakers.

SHORT ANSWER 10 x 3 = 30 Marks

13. Fuses.
14. Half value layer.
15. Properties of x- rays.
16. Diodes.
17. Filament transformer.
18. ALARA.
19. Anodes.
20. **Ten day rule**
21. Collimators.
22. Define roentgen and rad.

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Rajiv Gandhi University of Health Sciences, Karnataka

II Year B.Sc. Imaging Technology Degree Examination – 04-Jun-2024

Time: Three Hours | Max. Marks: 60 Marks

Radiographic Photography and Image Processing (RS-3)

Q.P. CODE: 1355

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 various steps of film processing in manual processing method
2. Describe in detail with a neat labeled diagram about the various layers of an X-ray film
3. Describe in detail about various factors affecting radiographic image

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

4. Magnification radiography
5. Type of x-ray films
6. Digital radiography
7. Constituents of fixer
8. Long scale and short scale
9. Radiology information system
10. Characteristic curve

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

11. Types of cassettes
12. Speed of films
13. Hangers
14. Wetting agents
15. Replenishers
16. Quantum detection efficiency
17. Film latitude

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Rajiv Gandhi University of Health Sciences, Karnataka

Second Year B.Sc. Medical Imaging Technology Degree Examination – 04-Jun-2024

Time: Three Hours | Max. Marks: 100 Marks

Imaging Physics and Dark Room Techniques (RS-4)

Q.P. CODE: 3291

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 in detail about Radiographic cassette.

2. Briefly explain about digital Radiography.
   OR
   Briefly explain about silver recovery
   Or
   Briefly explain about Developer solution. Replenishment of developer solution.

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

3. Radiographic films.
4. Automatic Processor.
5. Fixer.
   OR
   Latent image formation.
6. **Film Artifacts.**
7. Intensifying Screen.
8. Dark room construction in Minor Hospital.
9. Factors affecting on image quality.
10. Computed Radiography.
    OR
    Characteristic curve.
    Or
    Film storage.
11. Magnification.
12. **Exposure factors.**

SHORT ANSWER 10 x 3 = 30 Marks

13. Silver halides.
14. Functions of film base.
15. Define Anti halation layer.
16. Rare earth screens.
17. Intensification factor.
18. Advantages of metallic replacement.
19. Wet bench.
20. Phosphorus.
21. Unsharpeness.
22. Types of endurances.
    Or
    Crossover effect

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Rajiv Gandhi University of Health Sciences, Karnataka

II Year B.Sc. Imaging Technology Degree Examination – 21-Nov-2024

Time: 3 Hours Max. Marks: 40 Marks

Physics of Radiology – (RS-3)
Q.P. Code: 1353

Your answers should be specific to the questions asked.
Draw neat, labeled diagrams wherever necessary
(Note: Both QP Codes 1353 and 1354 are to be answered within total duration of 3 hours)

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

1. Explain the construction, working and designs of rotating anode X-ray tube with a neat, labelled diagram.
2. Explain in detail X-ray interaction with matter.

SHORT ESSAYS (Answer any Three) 3 x 5 = 15 Marks

3. Thermionic emission and photoelectric emission.
4. Explain absorbed and equivalent dose.
5. Radioactive decay and artificial radioactivity.
6. Explain anode heel effect and line focus principle.

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

7. Fluorescence and phosphorescence.
8. Half value thickness.
9. Conductors and insulators.
10. Inverse square law.
11. Atomic number and mass number.
12. Linear attenuation co-efficient.

II Year B.Sc. Imaging Technology Degree Examination – 21 November 2024

Time: 3 Hours Max. Marks: 40 Marks

Physics of Radiology – (RS-3)
Q.P. Code : 1354

Your answers should be specific to the questions asked.
Draw neat labeled diagrams wherever necessary
(Note : Both QP Codes 1353 and 1354 are to be answered within total duration of 3 hours)

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

1. Outline the relevant factors related to protection of staff and public from radiation including the protection provided by the manufacturer in the X-ray machine.
2. a) Explain in detail how scattered radiation can be controlled.
   b) Write in detail on beam centering devices and light beam collimators.

SHORT ESSAYS (Answer any Three) 3 x 5 = 15 Marks

3. Explain the line focus principle.
4. Write about interlocking circuits present in x-ray tubes.
5. What is grid? Describe the types of grids.
6. Uses of spinning top and step wedge.

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

7. What is filtration in x-ray tube?
8. Brief about self rectification
9. How Workload is calculated for an x-ray unit?
10. Examples of stochastic and non-stochastic effects
11. What is anti-scatter grid?
12. What do you mean by ‘doubling dose’?

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Rajiv Gandhi University of Health Sciences, Karnataka

II Year B.Sc. Medical Imaging Technology Degree Examination – 21-Nov-2024

Time: Three Hours | Max. Marks: 100 Marks

RADIATION PHYSICS
Medical Physics & Radiation Safety in Radio Diagnosis (RS-4)
Q.P. CODE: 3290

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 interactions of x-ray with matter and its application in radiology
2. Write in detail about image intensifier. Add a note on the factors affecting the performance of the image intensifier
   OR
   Explain in detail about radiation signages with appropriate diagrams

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

3. List the types of circuit breaker and explain magnetic circuit breaker
4. Main voltage compensation
5. Mention in detail about distribution of electrical energy
   OR
   Explain in detail about stabilizer used in x-ray
6. Design and working of full wave rectifier
7. Capacitor discharge generator
8. ICRP regulation
9. List the radiation measuring instruments and explain in detail about Ionization chamber
10. Radiation protection in Mammography
    OR
    Discuss about Genetic effect of radiation
11. Write a note on film badge
12. Radiation protection and handling of pregnant patients

SHORT ANSWER 10 x 3 = 30 Marks

13. Maximum permissible dose
14. Deterministic and stochastic effect
15. High tension switch
16. Air gap technique
17. High tension cable
18. Autotransformer
19. Define law of radioactive disintegration and half life period
20. Multifield image intensifier
21. Cinefluorography for recording the fluoroscopic image
22. Anode heel effect

Rajiv Gandhi University of Health Sciences, Karnataka

II Year B.Sc. Imaging Technology Degree Examination – 26-Nov-2024

Time: Three Hours | Max. Marks: 60 Marks

Radiographic Photography and Image Processing (RS-3)

Q.P. CODE: 1355

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 dark room planning-location, construction, ventilation, wall protection, entrance
2. Describe in detail with a neat labeled diagram about the various layers of an X-ray film
3. Describe in detail about computed radiography-principles, equipments, processing

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

4. Types of intensifying screens
5. Automatic processor
6. Films for special procedures
7. Constituents of fixer
8. Construction of cassettes
9. Phosphors
10. Density of film and speed of films

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

11. Film fog
12. Safe light
13. Sharpness
14. Speed of screens
15. Fluorescence
16. Formation of latent image
17. Spots and splashes

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Rajiv Gandhi University of Health Sciences, Karnataka

II Year B.Sc. Imaging Technology Degree Examination – 26-Nov-2024

Time: Three Hours | Max. Marks: 60 Marks

Radiographic Photography and Image Processing (RS-3)

Q.P. CODE: 1355

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 dark room planning-location, construction, ventilation, wall protection, entrance
2. Describe in detail with a neat labeled diagram about the various layers of an X-ray film
3. Describe in detail about computed radiography-principles, equipments, processing

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

4. Types of intensifying screens
5. Automatic processor
6. Films for special procedures
7. Constituents of fixer
8. Construction of cassettes
9. Phosphors
10. Density of film and speed of films

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

11. Film fog
12. Safe light
13. Sharpness
14. Speed of screens
15. Fluorescence
16. Formation of latent image
17. Spots and splashes

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Rajiv Gandhi University of Health Sciences, Karnataka

II Year B.Sc. Medical Imaging Technology Degree Examination – 26-Nov-2024

Time: Three Hours Max. Marks: 100 Marks

IMAGING PHYSICS AND DARK ROOM TECHNIQUES (RS-4)

Q.P. CODE: 3291

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. Discus in detail about automatic film processing
2. Explain intensification factor and the construction of intensifying screens with a neat diagram
   OR
   Explain construction of single emulsion film with a cross sectional diagram. Add a note on dental radiographic films

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

3. Phenidone – Hydroquinone (PQ) developers
4. Explain “Halation” and its methods of prevention
5. Care and protection of x-ray films
   OR
   Care and maintenance of screens
6. Radiographic noise
7. Duplitized films – merits and demerits
8. Explain the straight line portion of the characteristic curve in details
9. Factors affecting washing efficiency in manual processing
10. Explain exposure related film artifacts
    OR
    Explain processor related film artifacts
11. Silver recovery methods from the scrap x-ray films
12. Write a note on “Spectral sensitivity”

SHORT ANSWER 10 x 3 = 30 Marks

13. Curved cassette
14. Labyrinth
15. Safelight filters
16. Explain film latitude and exposure latitude
17. Reciprocity law
18. Draw a neat diagram of silver halide crystal and its mention the properties
19. “Hardeners” in developer replenisher
20. Short note absorption and quantum detection efficiency of screen
21. Define x-ray cassette, explain loading and unloading of cassettes
22. Maximum density

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Rajiv Gandhi University of Health Sciences, Karnataka

II Year B.Sc. Medical Imaging Technology Degree Examination – 28-Nov-2024

Time: Three Hours Max. Marks: 100 Marks

RADIOGRAPHIC POSITIONING AND TECHNIQUES (RS-4)

Q.P. CODE: 3292

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 Non-traumatic view of shoulder joint with anatomy
2. Explain brief anatomy of Pelvic Girdle. Add a note on pelvic outlet projection and Judet view
   OR
   Chest radiographic positioning – basic and any two special projections with anatomy

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

3. Radiographic projection of KUB
4. Folio method
5. Explain the radiographic projection to demonstrate the carpal tunnel syndrome
   OR
   Radiographic projection for perthes disease
6. Acute abdomen series
7. Radiographic positioning of cervical spine – flexion and extension
8. Cephalometry
9. Basic radiographic projection of elbow joint
10. Intra oral dental radiography
    OR
    Extra oral dental radiography
11. Explain the view to demonstrate the spondylolysis
12. Radiographic projection of dorsal spine

SHORT ANSWER 10 x 3 = 30 Marks

13. Draw a neat labelled diagram of foot
14. Define the following a) Abduction b) Adduction c) Circumduction
15. Sunrise view
16. Stress view of ankle joint
17. Planto-dorsal view of calcaneus
18. Name of the skull bones
19. Radiographic positioning of leg
20. Chest Apicogram
21. Water's view
22. Radiographic view to demonstrate the coccyx

Rajiv Gandhi University of Health Sciences, Karnataka

II Year B.Sc. Medical Imaging Technology Degree Examination – 28-Nov-2024

Time: Three Hours | Max. Marks: 100 Marks

RADIOGRAPHIC POSITIONING AND TECHNIQUES (RS-4)

Q.P. CODE: 3292

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 Non-traumatic view of shoulder joint with anatomy
2. Explain brief anatomy of Pelvic Girdle. Add a note on pelvic outlet projection and Judet view
   OR
   Chest radiographic positioning – basic and any two special projections with anatomy

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4. Folio method
5. Explain the radiographic projection to demonstrate the carpal tunnel syndrome
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7. Radiographic positioning of cervical spine – flexion and extension
8. Cephalometry
9. Basic radiographic projection of elbow joint
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    OR
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11. Explain the view to demonstrate the spondylolysis
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