Rajiv Gandhi University of Health Sciences

II Year M. Sc Medical Imaging Technology - SEP-2018

[Time: 3 Hours] [Max. Marks: 80]

Advanced Technique and Instrumentation of MRI

Q.P. CODE: 9545

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

LONG ESSAY (Answer Any Two) **2 X 10 = 20 Marks**

1. Describe in detail K-space filling and its relation to signal amplitude and spatial resolution.
2. Give an account of the current protocol and parameters for MRI triphasic study of liver.
3. Diffusion imaging and its B factor

SHORT ESSAY (Answer Any Eight) **8 X 5 = 40 Marks**

4. Black blood imaging in MRI and its uses
5. Safety parameters in MRI
6. Partial saturation / saturation recovery sequence
7. Time of flight phenomenon
8. What are the three components of an MRI signal? Discuss brief about them.
9. Discuss on the reason behind non uniformity of Bo.
10. Readout / frequency encoding
11. Gating mechanism in MRI
12. Chemical shift artifact, Gibb's artifact, Moire artifact, cross talk artifact
13. Care and maintenance in MRI

SHORT ANSWERS (Answer Any Ten) **10 X 2 = 20 Marks**

14. What is precession frequency?
15. Define the term spin-lattice.
16. Quadrature coils
17. Factors influencing signal intensity in MRI
18. Epilepsy protocol
19. Traditional multislice looping
20. What is relaxation time? Which tissue have long relaxation time and short relaxation time?
21. VENC and SENSE
22. Slice tracking or motion correction
23. Shim coil and define shimming
24. Abbreviate SPIR and SPAIR and mention the difference between them
25. Single voxel spectroscopy

Rajiv Gandhi University of Health Sciences

II Year M. Sc Medical Imaging Technology - SEP-2018

[Time: 3 Hours] [Max. Marks: 80]

Interventional Radiology Techniques
Q.P. CODE: 9546

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

LONG ESSAY (Answer Any Two) **2 X 10 = 20 Marks**

1. Brief out the need of interventional radiology, name few procedures done and explain any one procedures.
2. Discuss the trolley settings and other equipments to perform an angiographic procedures.
3. DSA for renal hypertension

SHORT ESSAY (Answer Any Eight) **8 X 5 = 40 Marks**

4. Check list for typical interventional cases. Explain in detail.
5. Injecting CO_2 for interventional procedures and add a note on its troubleshooting
6. Role of radiographers in interventional procedures
7. Give an account on Digital Image Processor.
8. Modes to prevent infection in Cath lab
9. Seldingers techniques
10. Selective and non-selective catheters
11. Embolization , its types and equipment used
12. Procedures done for CCF
13. Image intensifier

SHORT ANSWERS (Answer Any Ten) **10 X 2 = 20 Marks**

14. Stepping table DSA
15. Liquid embolic agents
16. Indications for uterine artery embolization
17. Equipments used for nephrostomy
18. Pulse oximeter
19. Protective devices used in Cath lab
20. Acceptable limits of variation in DSA
21. Role of pulsed fluoroscopy in reducing radiation dose
22. Management of hypotension during interventional procedures
23. End hole vs side hole catheters
24. Complications of arterial angioplasty
25. Contraindications for CO_2 angiography

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Rajiv Gandhi University of Health Sciences

II Year M. Sc Medical Imaging Technology - SEPT-2018

[Time: 3 Hours] [Max. Marks: 80]

Care of Patients in Diagnostic Radiology
Q.P. CODE: 9547

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

LONG ESSAY (Answer Any Two) **2 X 10 = 20 Marks**

1. Management of adverse contrast reactions in CT
2. Departmental safety measures
3. Role of technologist in patient care and patient safety

SHORT ESSAY (Answer Any Eight) **8 X 5 = 40 Marks**

4. Assessing the patients mobility
5. Radiation safety
6. Prevention of fall of patients from table
7. Isolation techniques
8. Role of technologist during terminally ill patient
9. Care of pregnant patient in MRI
10. How do you dress and redress the disability patients?
11. Wheel chair transfer
12. Use of immobilizer
13. Pre and post care of patients during interventional procedures

SHORT ANSWERS (Answer Any Ten) **10 X 2 = 20 Marks**

14. Informed consent form
15. What are the requirements for a radiographers to be a successful communicator?
16. What are the most effective method to avoid immobilizers?
17. What is to be done to the used needle and syringes?
18. Pulse oximetry
19. Screening for MRI scans
20. What is ischemia?
21. List four signs of circulatory impairment if a patient is wearing a cast.
22. What are three methods of reducing a patients exposure to ionizing radiation?
23. Three methods of moving the patients
24. TDS
25. What are the first aid guidelines if hazardous substance spill on a) Eye contact b) Skin contact c) Inhalation.

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Rajiv Gandhi University of Health Sciences

II Year M. Sc Medical Imaging Technology - SEPT-2018

[Time: 3 Hours] [Max. Marks: 80]

Radiation Evaluation and Protection in Diagnostic Radiology
Q.P. CODE: 9548

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

LONG ESSAY (Answer Any Two) **2 X 10 = 20 Marks**

1. Discuss various radiation area monitoring devices used.
2. Discuss in detail about radiation safety considerations in fluoroscopy room.
3. Explain various types of gas filled detectors and their working principle.

SHORT ESSAY (Answer Any Eight) **8 X 5 = 40 Marks**

4. Discuss about direct and indirect actions of radiation.
5. Give an account of specification of radiation protection devices.
6. Explain the following in brief a) Workload b) Occupancy factor c) Use factor d) Permissible dose.
7. Explain about radiation protection of pregnant patients in diagnostic radiology.
8. Explain ALARA principle and its rules and regulations.
9. Dose limits for occupational workers and public according to ICRP
10. Discuss the model layout of X ray room and its specifications according to AERB.
11. Discuss about pocket dosimeter with its advantages.
12. Explain about ionization chamber under the following headings.
    a) Working principle
    b) Construction
    c) Application
13. Maximum permissible dose limits as recommended by AERB for personal and public

SHORT ANSWERS (Answer Any Ten) **10 X 2 = 20 Marks**

14. Name radiation quantities and units
15. Genetic effects of radiation
16. Name the different types of area monitoring devices.
17. Radiation protective devices for pregnant woman in diagnostic radiology
18. Deterministic effects of radiation
19. Maximum permissible dose limits for worker and public according to AERB
20. Chronic effect of radiation
21. Protective barrier calculations
22. Advantages of pocket dosimeter
23. Personal radiation monitoring devices
24. Calibration instruments
25. Disadvantages of GM counter

Rajiv Gandhi University of Health Sciences

II Year M. Sc Medical Imaging Technology - SEPT/OCT-2018

[Time: 3 Hours] [Max. Marks: 80]

Nuclear Medicine Imaging Techniques
Q.P. CODE: 9549

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

LONG ESSAY (Answer Any Two) **2 X 10 = 20 Marks**

1. Explain in detail about a) SPECT b) PET.
2. Isotopes handling and storage in the department
3. Properties of Iodine 131. Explain about 24 hours Iodine uptake and Iodine 131 thyroid whole body scan.

SHORT ESSAY (Answer Any Eight) **8 X 5 = 40 Marks**

4. Explain β – decay in detail with its types. Give example for each with diagram.
5. Gamma ray production and properties
6. Transient and secular equilibrium
7. Ventilation and Perfusion scan
8. Principles of Geiger Muller counter
9. Isotopes calibrator
10. Dead time causes and its corrective methods
11. Modes of administration of isotopes
12. Methods for determining decay factors
13. Parent – daughter decay

SHORT ANSWERS (Answer Any Ten) **10 X 2 = 20 Marks**

14. Line of stability
15. Define specific gamma ray constant.
16. Block diagram of gamma camera
17. Avalanche photodiode
18. Cold kits
19. What is called as binding energy of an atom?
20. Cerenkow effect
21. Difference between X-rays and gamma rays
22. Basic principles of scintillation detectors
23. Cathode ray tube
24. Define tracer.
25. Dose modifying factors

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