

M.Sc. Medical Imaging Technology (MMIT)

2nd Year Examination

Subject: Advanced techniques and instrumentation of CT

Subject Code: MMIT- 201

Time: 3 Hours

M.M. 70

Note:All questions are compulsory. Make diagrams wherever required.

Q1. Long answer type questions. Attempt any three.

(10x3=30)

- Discuss about the technical consideration in obtaining the HRCT in detail.
- Write the protocol for CT coronary angiogram.
- Discuss about the MDCT in detail.
- Write the various types of CT artifacts and its rectification.
- Explain CT guided biopsy.

Q2. Short answer type questions. Attempt any five.

(5x5=25)

- Explain CT scanner gantry.
- Define Slip ring technology.
- Explain Patient preparation, positioning for CECT abdomen & role of technologist.
- Explain CT enteroclysis.
- Define HRCT temporal bone.
- Explain Volume Rendering
- Define Window level and window width

Q 3. Very short answer type questions. Attempt any five.

(1x5=5)

- What are the causes of beam hardening artifacts?
- What is CT numbers?
- What is linear interpolation?
- What is the CT number of air
- What do you understand by linear attenuation.
- What is the function of slip ring?
- Write the full form of MIP.

Q4. Multiple choice questions. Attempt all.

(1x10=10)

- Which of the following materials is used to construct the patient couch?
 - plastic
 - Fibre
 - Aluminium
 - cardboard
- In CT reference material is-
 - Water
 - Air
 - Bone
 - All of the above
- Spatial resolution in CT depends on.
 - High contrast objects
 - Pixel size
 - Noise
 - All of the above
- Mathematics used to reconstruct the images was evaluated by-
 - Godfrey Hounsfield
 - Alan Cormack
 - Sir wilhelm conard roentgen
 - None of the above
- Slip ring brushes are made-up of-
 - Tungsten
 - Cobalt
 - Nickle
 - Silver graphite
- With narrowing of the window, each gray scale covers
 - Larger CT number
 - Less CT number
 - No effect on CT number
 - None of the above
- contrast resolution in C.T. is
 - better than conventional films
 - less than conventional films
 - same as conventional films
 - none of the above
- C.T. scan uses tube:
 - Rotating anode tube
 - Stationary anode tube
 - Gassy tube
 - None of the above
- 2nd generation C.T. scan uses:
 - pencil beam of X-rays
 - Narrow fan beam
 - Broad fan beam
 - Multiple X-ray beam
- pixel size is:
 - FOV multiplied by matrix size
 - FOV divided by matrix size
 - FOV added by matrix size
 - none of the above

Printing Pages : 1

Paper Code :MMIT-202 A (SVSU:2022-23/R)

Enrollment No.

M.Sc. Medical Imaging Technology (MMIT)

2nd Year Examination

Subject: Advanced technique and instrumentation of MRI

Subject Code: MMIT- 202

Time: 3 Hours

M.M. 70

Note: All questions are compulsory. Make diagrams wherever required.

Q1. Long answer type questions. Attempt any three.

(10x3=30)

- a. Discuss about the Encoding, Data collection & Image formation
- b. What is pulse cycle? Discuss about Gradient echo pulse sequences
- c. Discuss about the indication, contraindication & protocol for MRI intervertebral disc.
- d. Write the various types of artifacts and its rectification.
- e. Explain functional MRI and its advantages.

Q2. Short answer type questions. Attempt any five.

(5x5=25)

- Define Time of flight phenomenon
- Define Spin echo sequences
- Explain Flow phenomena compensation
- Explain Layout planning
- Define Protocol for MRI prostate.
- Define Volume coil in MRI.
- Define Signal to noise ratio.

Q 3. Very short answer type questions. Attempt any five.

(1x5=5)

- What are the range of frequency used in MRI?
- Define proton density.
- What is TR and TE.
- What is flip angle?
- What do you understand by coherence and cohesition.
- What is the function of pulse oxymeter?
- Which coil is used for study of abdomen?

Q4. Multiple choice questions. Attempt all.

(1x10=10)

- Multiple choice questions**
- Which is the negative contrast agent used in MRI?
i. Ferric ammonium citrate ii. Per fluorocarbons iii. Lumentance Bracco iv. All
 - Who proposed that nucleus behave like a small magnet?
i. Faraday ii. Bloch iii. Newton iv. Brewster
 - Which flip angle is commonly used in MR imaging?
i. 30 degree ii. 45 degree iii. 60 degree iv. 90 degree
 - The critical temperature required to produce zero resistance for the alloy is -290 degree celcius ii. -269 degree celcius iii. -273 degree celcius iv. -300 degree celcius
 - The phase encoding gradient is turned on
i. During excitation ii. During slice selection
iii. During frequency encoding iv. Prior to readout
 - Protons in different molecules differ in all of the following ways except
i. T1 ii. T2 iii. Gyromagnetic ratio iv. Precession frequency
 - Used in assessment of the biliary system:
i. MRCP ii. MRA iii. MRU iv. None of the above
 - Magnetic field strength outside the imager is usually measured in:
i. Gauss ii. Tesla iii. Watts iv. SAR
 - An inversion recovery (IR) spin echo sequence begins with a:
i. 90° RF pulse ii. 180° RF pulse iii. 45° RF pulse iv. All of the above
 - RF shielding can be achieved by lining the MRI room with:
i. Steel ii. copper iii. lead iv. None of the above

Printing Pages : 1

Paper Code : MMIT-203

B (SVSU:2022-23/R)

Enrollment No.

M.Sc. Medical Imaging Technology (MMIT)

2nd Year Examination

Subject: Techniques and Equipments of Interventional Radiology and Nuclear Medicine Technology

Subject Code: MMIT- 203

Time: 3 Hours

M.M. 70

Note: All questions are compulsory. Make diagrams wherever required.

Q1. Long answer type questions. Attempt any three.

(10x3=30)

- Explain in detail about decay process of radioactivity.
- Discuss briefly about crash cart.
- Define contrast media and explain management of contrast media reaction and its treatment.
- Discuss any five radiation units and quantities.
- Explain in detail safe handling of radioactive materials.

Q2. Short answer type questions. Attempt any five.

(5x5=25)

- Describe radionuclide generator.
- Discuss in short on cold kit.
- Write a short note on type of radioactivity.
- Write DSA and its type.
- Describe role of radio-technologist during interventional procedures.
- Difference between catheter and guidewire.
- Describe angiographic table.

Q 3. Very short answer type questions. Attempt any five.

(1x5=5)

- What is sterile field?
- Define guidewire.
- Define image intensifier.
- What is natural radioactivity?
- Define thyroid ablation.
- What is PET?
- Define gamma camera.

Q 4. Multiple choice questions. Attempt all.

(1x10=10)

- Which of the following is HOCM?
 - Diatrizoate
 - Iohexol
 - Iopamidol
 - All
- In ionic contrast media, the iodine acts as
 - Cation
 - Anion
 - Both
 - None
- Adrenaline is given by which route
 - IV only
 - SC only
 - Orally
 - SC,IM, IV
- Which of the following is not the emergency drug?
 - Adrenaline
 - Atropin
 - Buscopan
 - Amphetamine
- Lignocaine is used as
 - Antiarrhythmics
 - Anaesthetics
 - Both
 - None
- Positron annihilation produces two photons of energy
 - 104keV
 - 232keV
 - 511keV
 - 1022keV
- NaI crystals are coupled with
 - PHA
 - SCA
 - ADC
 - PMT
- Radio-iodide is used for
 - Liver scanning
 - Bone scanning
 - Thyroid scanning
 - Lung scanning
- Isotopes of an element have a different number of
 - Proton
 - Electron
 - Neutron
 - Atom
- When two atomic nuclei combine it is called
 - chain reacion
 - Nuclear decay
 - Nuclear fusion
 - Nuclear fission

Note: All questions are compulsory. Make diagrams wherever required.

Q1. Long answer type questions. Attempt any three.

(10x3=30)

- Briefly describe hospital structure?
- Describe in detail the causative organism, mode of transmission and clinical features of AIDS?
- Describe in detail the correct method of blood pressure monitoring?
- Explain the role of radio technologist in radiology department in details?
- What is sterilization and explain different techniques of sterilization?

Q2. Short answer type questions. Attempt any five.

(5x5=25)

- what is cross infection?
- what point are to be kept in mind while handling infectious patients?
- write short note on personal hygiene?
- Discuss vital signs?
- Explain isolation techniques and type of isolation in details?
- Discuss about routes of drug administration?
- Explain Contrast media and types of contrast media?

Q3. Very short answer type questions. Attempt any five.

(1x5=5)

- Full form of AIDS.
- Normal respiratory rate of adult male.
- Value of normal blood pressure.
- What is immunity.
- What is ALARA principle.
- Define Informed Consent.
- Normal Pulse rate.

Q4. Multiple choice questions. Attempt all.

(1x10=10)

- AIDS is caused by
 - Virus
 - Bacteria
 - Both
 - None
- TB is
 - Non communicable disease
 - Communicable disease
 - Both
 - None
- Normal blood pressure is
 - 90/100
 - 100/90
 - 120/80
 - 80/120
- A hospital is:
 - Subjected to change in structure and function
 - Not subjected to change in structure and function
 - Subjected to change in structure but not in function
 - Subjected to change in function but not in structure
- Type of Communication:
 - Verbal
 - Non-verbal
 - Formal
 - All
- Disposal of anatomical waste in which container-
 - Red
 - Yellow
 - Blue
 - White
- Which one of these is used in mass communication
 - Newspaper
 - lecture
 - demonstration
 - Writing letter
- Autoclave Sterilization uses-
 - Heat
 - Hot Air
 - Cool steam
 - Both a and b
- Where is temperature regulated?
 - Hypothalamus
 - Skin
 - Heat & Cool
 - By what a person wears
- What is the instrument called to record temperature-
 - Stethoscope
 - Thermometer
 - Temperature
 - None of the above