Question Paper

Exam Date & Time: 30-May-2024 (10:00 AM - 12:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER BPT/BOT/B.Sc. (ESS/ RRT & DT / RT / MIT) / FOURTH SEMESTER B.Sc. (PFT / CVT / CND / MLT / HIM / BOPT / BAOTT / RT / EMT / PHYSICIAN ASSISTANT / PSYCHOLOGY / NMT) / EIGHT SEMESTER (BPT / BOT) / SECOND SEMESTER BASLP DEGREE EXAMINATION - MAY/JUNE 2024
SUBJECT: BST3201 / STAT 402 / BST 3202 - BIOSTATISTICS AND RESEARCH METHODOLOGY / BIOSTATISTICS / BASIC BIOSTATISTICS AND RESEARCH METHODOLOGY
(2016/2020/2022 SCHEME)

Marks: 50 **Duration: 120 mins.**

Answer all the questions.

1A)	Elaborate graphical representation with examples.	(5)
1B)	Explain the properties of normal distribution with diagram.	(5)
2A)	Describe different types of clinical study designs.	(5)
2B)	Write short notes on non-probability sampling.	(5)
3A)	The triglycerides (serum) (in mg/dL) of 10 patients were as follows: 155, 150, 106, 89, 63, 68, 144, 125, 130, 74 Calculate mean, and standard for the above data.	(5)
3B)	Define the following: (i) Incidence rate (ii) prevalence rate.	(5)
3C)	Discuss about regression analysis and its two equations.	(5)
3D)	Write short notes on research process.	(5)
4A)	Define skewness.	(2)
4B)	The following are the weights for 10 patients. Calculate range and mode 60, 54, 74, 82, 59, 63, 72, 89, 58, 85.	(2)
4C)	What is meant by systematic sampling?	(2)
4D)	Define scatter plot.	(2)
4E)	Define case report.	(2)

-----End-----

Question Paper

Exam Date & Time: 27-May-2024 (10:00 AM - 12:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER B.Sc. MIT DEGREE EXAMINATION - MAY/JUNE 2024
SUBJECT: BMIT 302 - IMAGING PHYSICS AND DARKROOM TECHNIQUES (PART II)
(2016 SCHEME)

Marks: 50 **Duration: 120 mins.**

Answer all the questions.

1)	Explain in detail about principle of image intensification with a labelled diagram.	(10)
2)	Write in detail about Rotating anode x-ray.	(10)

3. **Discuss the following**

3A)	Main voltage compensation.	(5)
3B)	Beam restrictors.	(5)
3C)	Darkroom design and construction.	(5)
3D)	Airgap techniques.	(5)

4. **Write note on:**

4A)	Rectifiers.	(2)
4B)	Film transport.	(2)
4C)	Added filter.	(2)
4D)	Space charge effect.	(2)
4E)	Define types of grids.	(2)

-----End-----

Question Paper

Exam Date & Time: 23-May-2024 (10:00 AM - 12:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER B.Sc. MIT DEGREE EXAMINATION - MAY/JUNE 2024
SUBJECT: BMIT 306 - RECENT TRENDS IN COMPUTED TOMOGRAPHY
(2016 SCHEME)

Marks: 50 **Duration: 120 mins.**

Answer all the questions.

1)	Explain in detail the characteristics of CT Image quality	(10)
2)	Discuss in detail about CT detector technology	(10)
3A)	Write a short note on the role of CT technologist	(5)
3B)	Explain about Slip ring technology	(5)
3C)	Write a short note on filtered back projection	(5)
3D)	List the differences between first generation and third generation CT scanners	(5)
4A)	Explain the cause and remedy of ring artefacts in CT.	(2)
4B)	Define pixel and voxel	(2)
4C)	List the features of Gantry and patient couch in CT	(2)
4D)	Define detector cross-talk	(2)
4E)	Write the patient preparation for CECT abdomen and pelvis.	(2)

-----End-----

Question Paper

Exam Date & Time: 17-May-2024 (10:00 AM - 12:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER B.Sc.(MEDICAL IMAGING TECHNOLOGY) DEGREE EXAMINATION - MAY/JUNE 2024
SUBJECT: BMIT 308- RECENT TRENDS IN MAGNETIC RESONANCE IMAGING
(2016 SCHEME)

Marks: 50 **Duration: 120 mins.**

Answer all the questions.

1)	Explain the basic principle of MRI in detail.	(10)
2)	Explain ANY FIVE artefacts in MRI with causes, appearance, and remedy.	(10)
3A)	Write a note on inversion recovery.	(5)
3B)	Explain about gradient moment rephrasing.	(5)
3C)	Write a note on the safety zones in MRI.	(5)
3D)	Write a note on gradient coils.	(5)
4A)	List the various techniques of MR Angiography.	(2)
4B)	List ANY TWO advantages and disadvantages of Super conducting magnets.	(2)
4C)	List the factors affecting spatial resolution in MRI.	(2)
4D)	Define fringe field.	(2)
4E)	Define passive and active shimming.	(2)

-----End-----

Question Paper

Exam Date & Time: 23-May-2024 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER B.Sc. MIT DEGREE EXAMINATION - MAY/JUNE 2024
SUBJECT: MIT3201 - COMPUTED TOMOGRAPHY - II
(2020 SCHEME)

Marks: 100 **Duration: 180 mins.**

Answer all the questions.

1)	Explain the various techniques used to reduce the radiation dose in CT.	(20)
2)	Classify the CT contrast media. Explain various adverse contrast media reactions and management.	(20)
3)	Explain in detail about cause, appearance, and remedy for CT equipment induced artefacts.	(10)
4)	Explain the CT guided Biopsy.	(10)
5A)	Explain post-processing techniques of volume rendering and surface rendering.	(5)
5B)	Explain in detail about high contrast resolution in CT.	(5)
5C)	Explain the role of CT Technologist.	(5)
5D)	Summarize the universal precautions.	(5)
5E)	Explain image processing and formation in CT.	(5)
5F)	Explain in detail the techniques and principles of staff safety in CT.	(5)
6A)	Explain detail about DLP in CT.	(2)
6B)	List the indication and contra-indication of CT guided RF ablation.	(2)
6C)	Define pixel and voxel.	(2)
6D)	Define temporal resolution.	(2)
6E)	Define PACS.	(2)

-----End-----

Question Paper

Exam Date & Time: 17-May-2024 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER B.Sc. MIT DEGREE EXAMINATION - MAY/JUNE 2024
SUBJECT: MIT3202 - MAGNETIC RESONANCE IMAGING II
(2020 SCHEME)

Marks: 100 **Duration: 180 mins.**

Answer all the questions.

1)	Explain the mechanism, clinical application, parameters, advantages, and disadvantages of spin echo sequences.	(20)
2)	Classify MR artefacts and explain the appearance, cause and remedy of each in detail.	(20)
3)	Explain the mechanism, parameters,clinical application, advantages and disadvantages of Time of Flight MRA.	(10)
4)	Illustrate the various types of flow phenomena.	(10)
5A)	Explain the mechanism, clinical application, parameters, advantages and disadvantages of incoherent gradient echo.	(5)
5B)	Outline the mechanism of action of T1 contrast agents.	(5)
5C)	Plan the image acquisition protocol for MRI Lumbar Spine imaging.	(5)
5D)	Outline different types of cardiac gating techniques.	(5)
5E)	Outline acquisition techniques and clinical applications for single shot k-space filling.	(5)
5F)	Explain the pulse sequence used, parameters,clinical application, advantages and disadvantages of various conventional vascular imaging techniques.	(5)
6A)	Outline the applications of parallel imaging.	(2)
6B)	List the advantages and disadvantages of PC-MRA.	(2)
6C)	List the clinical applications of diffusion weighted imaging.	(2)
6D)	List the significance of documentation during MR examination.	(2)
6E)	List the uses of fat saturation technique.	(2)

-----End-----

Question Paper

Exam Date & Time: 27-May-2024 (10:00 AM - 12:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER B.Sc. MIT DEGREE EXAMINATION - MAY/JUNE 2024
SUBJECT: MIT3242 - PROGRAM ELECTIVE - II : BASIC IN NUCLEAR MEDICINE TECHNOLOGY
(2020 SCHEME)

Marks: 50 **Duration: 120 mins.**

Answer all the questions.

1)	Discuss the interaction of charged particles with matter.	(10)
2)	Outline the layout of different types of nuclear medicine laboratories.	(10)
3A)	Explain nuclear medicine imaging for skeletal and thyroid.	(5)
3B)	Explain radioactive waste management in nuclear medicine.	(5)
3C)	Write a short note on properties of gamma-rays and aphaparticles.	(5)
3D)	Explain working of a gas-filled detector.	(5)
4A)	Mention basic three principles for radiation protection.	(2)
4B)	List the radiopharmaceuticals utilized for kidney imaging of tubular secretion and GFR.	(2)
4C)	Define radioactivity.	(2)
4D)	Mention two important functions of PMT.	(2)
4E)	Mention two differences between SPECT and PET.	(2)

-----End-----