THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0122] JANUARY 2022 Sub. Code: 1852
(FEBRUARY 2021 & AUGUST 2021 EXAM SESSION)

B.Sc. RADIOGRAPHY AND IMAGING TECHNOLOGY
THIRD YEAR
PAPER II – MODERN IMAGING TECHNIQUES AND RECENT TRENDS IN IMAGING
Q.P. Code: 801852

Time: Three Hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. i) Discuss in detail about DSA.
   ii) Write about the various contrast agents used in angiographic imaging.
2. Discuss in detail about the construction, principle and working of a gamma camera.
3. Write in detail about the principle of image formation in MR and about various image Sequences followed in it.

II. Write notes on: **(8 x 5 = 40)**

1. Advantages of MDCT.
2. Methods of disposal of liquid wastes generated in a nuclear medicine department.
3. TRUS.
4. Stereotactic biopsy using mammography
5. Discuss about the safety precautions to be followed during PET-CT procedure.
6. PACS.
7. Doppler ultrasound
8. How is radiation dose measured? Write down any three methods to reduce radiation exposure in radiology practices.

III. Short answers on: **(10 x 3 = 30)**

1. HIDA scan
2. Filters
3. Molybdenum generator
4. Mammo tomogram
5. Deep vein thrombosis
6. Expand IGRT and PACS
7. List any three clinical applications of ultrasound.
8. Role of radiographer in angiographic techniques.
9. Heel effect.
10. Piezo electric effect.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0922] SEPTEMBER 2022 Sub. Code: 1852
(FEBRUARY 2022 & AUGUST 2022 EXAM SESSIONS)

B.Sc. RADIOGRAPHY AND IMAGING TECHNOLOGY
THIRD YEAR (Regulation from 2018-2019)
PAPER II – MODERN IMAGING TECHNIQUES AND RECENT TRENDS IN IMAGING
Q.P. Code : 801852

Time: Three hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. Explain MRI protocol for Acute stroke.
2. Explain CT Triple phase and how hemangioma is identified.
3. Define embolization and explain the steps involved in Uterine Artery embolization.

II. Write notes on: **(8 x 5 = 40)**

1. Explain STIR sequence and uses.
2. Linear Probe and its uses.
3. Explain the factors affecting Quality and Intensity of X-ray.
4. PACS and its uses.
5. Difference between T1 and T2 Sequence.
6. Beam hardening and Streak artifact in CT.
7. Cone-Beam CT.
8. Patient preparation and techniques of MRCP.

III. Short answers on: **(10 x 3 = 30)**

1. X-ray filters and uses.
2. Quenching.
3. Define Half-life and what is half-life of FDG?
4. DEXA.
5. Heel effect in mammogram.
6. Standardized Uptake Value (SUV).
7. Low dose CT.
8. Surface coil and its advantage.
9. MR spectroscopy.
10. Bolus Tracking.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0423] **APRIL 2023** **Sub. Code: 1852**

B.Sc. RADIOGRAPHY AND IMAGING TECHNOLOGY
THIRD YEAR (Regulation 2018-2019 onwards)
PAPER II – MODERN IMAGING TECHNIQUES AND RECENT TRENDS IN IMAGING
Q.P. Code : 801852

Time: Three hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. Define Ultrasound and Modes of Ultrasound.
2. Explain principle of PET scan and how PET is performed for Cancer Screening.
3. Explain MR Safety and steps to be followed before scanning.

II. Write notes on: **(8 x 5 = 40)**

1. Renal Scintigraphy.
2. Sector probe and its uses.
3. Iohexol vs Gadolinium.
4. Advantage and limitation of Sonomammogram.
5. Explain FLAIR sequence and its uses.
6. Prospective and retrospective gating.
7. Maximum and minimum intensity projection and MPR reconstruction in CT.
8. MR imaging of Hippocampus.

III. Short answers on: **(10 x 3 = 30)**

1. Shimming in MRI.
2. Pin hole collimator and uses.
3. Define Half-life and half-life of Iodine-131.
4. Diffusion Weighted Imaging.
5. Magnification in mammogram.
6. Gastric emptying study.
7. Advantage of MDCT.
8. Gradient coil and its uses.
9. Tractography.
10. Uses of Gradient sequence.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1123] **NOVEMBER 2023** **Sub. Code: 1852**

B.Sc. RADIOGRAPHY & IMAGING TECHNOLOGY
THIRD YEAR (Regulation 2018-2019 onwards)
PAPER II – MODERN IMAGING TECHNIQUES AND RECENT TRENDS IN IMAGING
Q.P. Code: 801852

Time: Three hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. Explain CT Perfusion protocol for Acute Stroke.
2. Explain Dark and Bright Blood Imaging in MRI.
3. Explain the Chemoembolization procedure for Hepatocellular Carcinoma.

II. Write notes on: **(8 x 5 = 40)**

1. Bone Scan.
2. Curvilinear Probe and its uses.
3. Define Inverse Square Law. Calculate intensity at 1 m and 4 m; if intensity at 2 meter is 100 mR.
4. Digital Breast Tomography.
5. STIR Sequence and its uses.
6. Chemical shift and Aliasing artifact in MRI.
7. Surface shaded display and Volume Rendering in CT.
8. Patient preparation and techniques of MR Shoulder imaging.

III. Short answers on: **(10 x 3 = 30)**

1. CT Filters and uses.
2. Uses of Carbone dioxide in Imaging.
3. Define Half-life and half-life of Technetium 99m.
4. DSA.
5. Define Heel effect and how it is technically utilized?
6. What is DEXA?
7. HRCT.
8. Volume coil and its uses.
9. F-MRI principle.
10. Define HU and write HU Value of Muscle and Bone.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0424] **APRIL 2024** **Sub. Code: 1852**

B.Sc. RADIOGRAPHY & IMAGING TECHNOLOGY
THIRD YEAR (Regulation 2018-2019 onwards)
PAPER II – MODERN IMAGING TECHNIQUES AND RECENT TRENDS IN IMAGING
Q.P. Code: 801852

Time: Three hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. Discuss Physics and Principles of Spiral CT and add a note on Multidetector CT.
2. Discuss the principles of MRI. Explain T_1 and T_2 relaxation and describe about pulse sequences.
3. Discuss in detail about Digital Mammography with Tomosynthesis.

II. Write notes on: **(8 x 5 = 40)**

1. Color Doppler Imaging.
2. Cyclotron.
3. Functional MRI.
4. Contraindication for MRI / precautions while doing MRI.
5. 4D Computed Tomography.
6. T_C 99 bone scan.
7. Advantages and limitations of Sonomammogram procedure.
8. Nuclear Imaging in Myocardial perfusion.

III. Short answers on: **(10 x 3 = 30)**

1. TLD.
2. MR Enteroclysis.
3. Diffusion Tensor Imaging.
4. MRI inversion recovery sequences.
5. Teleradiology.
6. What is low dose CT?
7. Oncological indication of F18 FDG PET / CT.
8. DMSA scan.
9. What are the Image criteria for adequate Cranio–Caudal and MLO view in Mammography?
10. Image intensifier.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0125] **JANUARY 2025** **Sub. Code: 1852**

B.Sc. RADIOGRAPHY & IMAGING TECHNOLOGY
THIRD YEAR (Regulation 2018-2019 onwards)
PAPER II – MODERN IMAGING TECHNIQUES AND RECENT TRENDS IN IMAGING
Q.P. Code: 801852

Time: Three hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. Write on DMSA scan in Nuclear Medicine.
2. Discuss about CT guided Biopsy.
3. Write on Advanced Projections in Mammography.

II. Write notes on: **(8 x 5 = 40)**

1. MRI stroke protocol.
2. CT cisternogram.
3. Describe color Doppler Imaging.
4. Radio isotopes used as Therapeutic agents in Nuclear Medicine.
5. List the Non oncological indication of PET / CT.
6. Modern dose reduction methods in CT scan imaging.
7. Diffusion Tensor imaging.
8. Nuclear Imaging in myocardial perfusion.

III. Short answers on: **(10 x 3 = 30)**

1. MRI – cochlear imaging.
2. CT PNS.
3. How will you prepare a patient for PET - CT?
4. Dynamic MRI studies.
5. DTPA.
6. TVS scan.
7. Radio Isotopes used in Thyroid scanning.
8. MR contrast agent.
9. Virtual colonoscopy.
10. Standardised uptake value.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0425] **APRIL 2025** **Sub. Code: 1852**

B.Sc. RADIOGRAPHY & IMAGING TECHNOLOGY
THIRD YEAR (Regulation 2018-2019 onwards)
PAPER II – MODERN IMAGING TECHNIQUES AND RECENT TRENDS IN IMAGING

Q.P. Code: 801852

Time: Three hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. Elaborate in detail the various imaging methods to evaluate a patient with intracranial aneurysmal bleed. Explain in detail the therapeutic international procedure for a patient with intracranial aneurysm and its complications.
2. Classify the various CT contrast agents. Explain how will you handle patient with severe allergic contrast reaction while taking CT angiography in your department.
3. Explain in detail the working principal of PET-CT images in a patient with carcinoma breast.

II. Write notes on: **(8 x 5 = 40)**

1. Discuss in detail on MR Enteroclysis.
2. Enumerate the indication and advantage of T-tube cholangiography.
3. What is the clinical application of Sonoelastography? Name any two organs in which it is applied to?
4. Cardiac scintigraphy.
5. MRI stroke protocol.
6. Spot compression and Spot magnification view in mammography.
7. What are the characteristic of Radiopharmaceutical?
8. HRCT Thorax.

III. Short answers on: **(10 x 3 = 30)**

1. CT PNS.
2. What is the cause for wrap around artifact? How to rectify it?
3. How will you acquire a Proton Density (PD) weighted images?
4. Cleavage view.
5. What is deterministic effect?
6. Name few cerebral catheters and its clinical applications.
7. Name few T_2 relaxation contrast agents and its clinical applications.
8. Mention the MRI C Spine sequences with significance.
9. What are the advantage of Picture Archiving and Communication System (PACS) in imaging department?
10. What are the precautions taken to avoid Nephrogenic systemic fibrosis in a patient coming for MR contrast procedures?

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1125] **NOVEMBER 2025** **Sub. Code: 1852**

B.Sc. RADIOGRAPHY & IMAGING TECHNOLOGY
THIRD YEAR (Regulation 2018-2019 onwards)
PAPER II – MODERN IMAGING TECHNIQUES
AND RECENT TRENDS IN IMAGING
Q.P. Code: 801852

Time: Three hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. Classify various embolization agents based on its mechanism of action. Explain in detail about the clinical indications, procedure and complication of Uterine artery embolization.
2. Explain the working principle of MRI. Discuss in detail the clinical indications, patient preparation and various sequences in acquisition of MRCP.(MR Cholangiopancreatography)
3. Classify various generation of CT based on its working principles? Explain in detail the patient preparation, protocols for CECT abdomen in a patient with carcinoma rectum with liver metastasis.

II. Write notes on: **(8 x 5 = 40)**

1. Discuss in detail about MR Urogram.
2. Discuss in detail about the role of MRS (MR Spectroscopy) in CA Prostate.
3. Discuss in detail about Dacryocystography.
4. Discuss in detail about Bone Scintigraphy.
5. Discuss in detail about Stereotactic biopsy.
6. Discuss in detail about HIFU and its clinical applications.(High Intensity Focused Ultra sound)
7. Explain the working principle of Digital Radiography.
8. Enumerate the advantage and uses of TLD badges over film badges.

III. Short answers on: **(10 x 3 = 30)**

1. Define the process Shimming.
2. Stochastic effect.
3. T_1 relaxation contrast agents.
4. Explain about coronary catheters and its clinical application.
5. Explain the process of CT installation under AERB guidelines.
6. Percutaneous transhepatic cholangiography.
7. What is the clinical indications of CISS sequence? (Constructive Interference in Steady State)
8. Mention few CT artefacts.

9. What is the advantage of virtual CT colonoscopy?
10. How to reduce scatter radiation?

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