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

**[AHS 0122] JANUARY 2022 Sub. Code: 1851**
**(FEBRUARY 2021 & AUGUST 2021 EXAM SESSION)**

**B.Sc. RADIOGRAPHY AND IMAGING TECHNOLOGY**
**THIRD YEAR (Regulation 2018-2019)**
**PAPER I – EQUIPMENTS OF ADVANCED MODERN IMAGING MODALITIES**
***Q.P. Code : 801851***

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

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

1. Describe in detail the various parts of Mammography equipment.
2. Discuss in detail the various generations of the CT Scanners. Mention the advantage of the multislice CT scanner over conventional CT.
3. Describe an ultrasound transducer with suitable diagram and elaborate the various types of ultrasound transducers.

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

1. CR Reader.
2. 3 Artifacts in CT.
3. Flip Angle.
4. Gamma camera.
5. Explain two radioisotopes used in Nuclear Medicine.
6. Physical principle of PET.
7. Image reconstruction in CT.
8. Pulse sequence in MRI.

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

1. Tomography.
2. Resonance.
3. Flip angle.
4. Bow-tie filter.
5. Larmour Frequency.
6. Tesla.
7. What is window width and window level?
8. Advantages of MRI over CT images.
9. Gradient coil.
10. CR image plate phosphor.

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

**[AHS 0922] SEPTEMBER 2022 Sub. Code: 1851**
**(FEBRUARY 2022 & AUGUST 2022 EXAM SESSIONS)**

**B.Sc. RADIOGRAPHY AND IMAGING TECHNOLOGY**
**THIRD YEAR (Regulation from 2018-2019)**
**PAPER I – EQUIPMENTS OF ADVANCED MODERN IMAGING MODALITIES**
***Q.P. Code : 801851***

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

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

1. Describe in detail the function of a digital subtraction angiography machine.
2. Explain in detail the basic imaging concepts in MR imaging.
3. Describe in detail about the physical principle of CT image formation.

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

1. Multi detector CT.
2. Principle of PET-CT.
3. Spin echo sequence.
4. Ultrasound transducer.
5. Indirect flat panel detectors.
6. Single Photon Emission Computed Tomography.
7. Bio effects of MRI.
8. Pitch.

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

1. Filtration.
2. B-Mode in ultrasound.
3. What are the uses of PACS?
4. Phased array transducer.
5. Define pixel in CT.
6. Mammographic X-Ray film.
7. Artifacts in MRI.
8. Half life.
9. Advantages of Gamma Camera over Rectilinear Scanner.
10. CTDI.

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

**[AHS 0423]** **APRIL 2023** **Sub. Code: 1851**

**B.Sc. RADIOGRAPHY AND IMAGING TECHNOLOGY**
**THIRD YEAR (Regulation 2018-2019 onwards)**
**PAPER I – EQUIPMENTS OF ADVANCED MODERN IMAGING MODALITIES**
***Q.P. Code : 801851***

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

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

1. Describe in detail the parts of MRI equipment. MRS protocol and image acquisition. Name few MRI artifacts.
2. Principles and functions of PET CT. Advantages and limitation of PET CT.
3. Describe about the priniciple of Piezo-electric effect. Discuss about types of Transducers. Various modes of Ultrasound.

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

1. Digital Breast Tomosynthesis (draw a diagram).
2. Computer Radiography (CR) reader.
3. Dual energy CT.
4. Magnification Mammography.
5. Describe in detail about the construction of Mammogram equipment.
6. Pulse sequences in MRI.
7. Protocol for CT Aortogram, CT Artifacts.
8. DSA basic principle.

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

1. Chemical shift artifact.
2. ECG gating.
3. Define TRUS. Explain in detail about the transducer used for TRUS.
4. Reverberation artifact in USG.
5. Bone Density Scan (DEXA).
6. Quality Assurance in Computed Tomography.
7. Windowing in CT.
8. Picture Archiving and Communication Systems (PACS).
9. Grey scale in CT.
10. Shimming.

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

**[AHS 1123] NOVEMBER 2023 Sub. Code: 1851**

**B.Sc. RADIOGRAPHY & IMAGING TECHNOLOGY**
**THIRD YEAR (Regulation 2018-2019 onwards)**
**PAPER I – EQUIPMENTS OF ADVANCED MODERN IMAGING MODALITIES**
***Q.P. Code: 801851***

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

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

1. Discuss in detail the principle and working of a Gamma Camera.
2. Describe about construction and working of Mammographic X-ray equipment. Brief notes about X-ray beams and filters in Mammogram.
3. Discuss about types of Transducers. Various modes of Ultrasound. Add a note on Piezo-electric effect.

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

1. Dual energy CT.
2. Gradient Echo sequence.
3. Artifacts during MR imaging.
4. Types of magnets in MRI.
5. Explain Voxel.
6. Explain the physical properties of Ultrasound.
7. Explain fifth generation CT.
8. Explain various filters in X-Ray.

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

1. Scintillation detector.
2. Linear attenuation co-efficient.
3. What is the basic principle of DSA?
4. MR Angiography techniques.
5. TR and TE.
6. What is FID in MRI?
7. Compare conventional mammography with digital mammography.
8. Focused transducer.
9. Gradient coil.
10. CT number.

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