[LL 0817] AUGUST 2017 **Sub. Code: 1836**

B.Sc. RADIOLOGY IMAGING TECHNOLOGY

(New syllabus 2014 - 2015)

THIRD YEAR

PAPER I – EQUIPMENTS OF MODERN IMAGING MODALITIES

Q.P. Code: 801836

Time: Three Hours **Maximum: 100 Marks**

Answer all questions

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

1. Explain the parts and working principle of CT scanner. Write in detail the image reconstruction in computed tomography.
2. Discuss about radiofrequency coils. Explain about signal encoding for image formation in MRI.
3. Ultrasound transducer. Enumerate the various types of Ultrasonography probes used in imaging.

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

1. Spin echo sequence.
2. PET CT – working principle and radioisotopes used.
3. Interaction of ultrasound with matter.
4. Different modes of ultrasound imaging.
5. Explain in detail about indirect flat panel detectors.
6. Discuss about any 3 Artefacts in MRI.
7. Mammography machine.
8. Factors affecting image quality in MRI.

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

1. Ring artifacts – cause and remedy.
2. Flip angle.
3. Gadolinium as contrast medium.
4. Tomography.
5. Piezo-electric effect.
6. CT number.
7. Gradient coil.
8. Image phosphor plate in CR.
9. Focused transducer.
10. Curie temperature.

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[LM 0218] FEBRUARY 2018 **Sub. Code: 1836**

B.Sc. RADIOLOGY IMAGING TECHNOLOGY
(New Syllabus 2014-2015)

THIRD YEAR

PAPER I – EQUIPMENTS OF MODERN IMAGING MODALITIES

Q.P. Code: 801836

Time: Three Hours **Maximum: 100 Marks**

Answer all questions

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

1. Explain in detail the basic imaging concepts in MR imaging.
2. Describe about the various flat panel detectors in X-ray imaging.
3. Describe in detail the various parts of mammography equipment.

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

1. Gradient echo sequence.
2. CR reader.
3. Types of magnets in MRI.
4. Multi detector CT.
5. Ultrasound transducer.
6. 3 Artefacts in CT.
7. Effect of contrast agents used in MRI.
8. Factors affecting image quality in CT.

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

1. Linear attenuation co-efficient.
2. TR and TE.
3. T1w imaging.
4. Zebra artifact in MRI: cause and remedy.
5. Phased array transducer.
6. Curie temperature.
7. Precessional frequency.
8. Resonance.
9. Tomography.
10. Filtration in X-ray imaging.

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[LN 0818] AUGUST 2018 **Sub. Code: 1836**

B.Sc. RADIOLOGY IMAGING TECHNOLOGY
(New Syllabus 2014-2015)

THIRD YEAR

PAPER I – EQUIPMENTS OF MODERN IMAGING MODALITIES

Q.P. Code: 801836

Time: Three Hours **Maximum: 100 Marks**

Answer all questions

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

1. Discuss in detail the various generations of the CT scanners. Mention the advantages of the multislice CT scanner over conventional CT.
2. Describe in detail the various parts of a mammography equipment.
3. Describe about the different flat panel detectors used in X-ray imaging.

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

1. Explain the principle of PET-CT.
2. Explain Fraunhoffer Zone in Ultrasound.
3. Spin echo sequence.
4. Superconductive magnet.
5. Factors affecting image quality in computed radiography.
6. Larmor frequency in MRI.
7. Factors affecting image quality in MRI.
8. Nuclear imaging in myocardial perfusion.

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

1. Piezo-electric effect.
2. Flip angle.
3. Ring artifacts.
4. CT number.
5. What is wrap around artifact in MRI?
6. Scintillation detector.
7. B mode in ultrasound.
8. T2w imaging.
9. What is the basic principle of DSA?
10. What are the uses of PACS?

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[LO 0219] FEBRUARY 2019 **Sub. Code: 1836**

B.Sc. RADIOLOGY IMAGING TECHNOLOGY
(New Syllabus 2014-2015)

THIRD YEAR

PAPER I – EQUIPMENTS OF MODERN IMAGING MODALITIES

Q.P. Code: 801836

Time: Three Hours **Maximum: 100 Marks**

Answer all questions

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

1. Describe an Ultrasound transducer with suitable diagram. Enumerate the various types of Ultrasound transducers.
2. Describe in detail the function of a digital subtraction angiography machine.
3. Discuss in detail the principle and working of a gamma camera.

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

1. Enumerate the various interactions of Ultrasound waves with matter.
2. Artifacts encountered during MR imaging.
3. What is radio frequency pulse? Add a note on chemical shift imaging.
4. CR image reader.
5. Explain in detail about indirect flat panel detectors.
6. Explain CT windowing
7. Explain Xenon gas detectors in CT.
8. Discuss about two radio isotopes used as a therapeutic agent in nuclear medicine.

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

1. What is FID in MRI?
2. Define pixel in CT.
3. Various filters used in X-ray imaging.
4. Compare conventional mammography with digital mammography.
5. Role of Ultrasound in obstetrics.
6. MR angiography techniques.
7. Define Pitch in CT.
8. CR image plate phosphor.
9. Tesla.
10. Quadrature body coil.

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[LP 0819] AUGUST 2019 **Sub. Code: 1836**

B.Sc. RADIOLOGY IMAGING TECHNOLOGY
(New Syllabus 2014-2015)

THIRD YEAR

PAPER I – EQUIPMENTS OF MODERN IMAGING MODALITIES

Q.P. Code: 801836

Time: Three Hours **Maximum: 100 Marks**

Answer all questions

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

1. Discuss about Radio frequency coils. Explain the various signal encoding for image formation in MRI.
2. Explain CT artifacts in detail.
3. Discuss in detail the Digital Radiography. Mention the advantages of digital radiography over conventional radiography.

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

1. Discuss about any three artifacts in MRI.
2. Contrast media used in MRI.
3. Explain CT windowing.
4. Explain the physical properties of Ultrasound.
5. Explain fifth generation CT.
6. Radio Isotope generator.
7. Photomultiplier tube.
8. Single Photon Emission Computed Tomography (SPECT).

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

1. Shimming.
2. Acoustic coupling.
3. Bow tie filter.
4. Proton density weighted imaging and its applications.
5. Reverberation artifact in ultrasonography.
6. Tesla.
7. Gradient coil.
8. Focused transducer.
9. Phased array transducer.
10. TR and TE in MRI.

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[LQ 0220] FEBRUARY 2020 **Sub. Code: 1836**

B.Sc. RADIOLOGY IMAGING TECHNOLOGY
(New Syllabus 2014-2015)

THIRD YEAR

PAPER I – EQUIPMENTS OF MODERN IMAGING MODALITIES

Q.P. Code: 801836

Time: Three Hours **Maximum: 100 Marks**

Answer all questions

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

1. Give a detailed account of the physical properties of ultrasound and how images are formed in ultrasound scanner?
2. Discuss in detail about CT equipment.
3. Describe the physical principle of DSA.

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

1. Mammographic x-ray tube.
2. Doppler ultrasound imaging.
3. Image reconstruction in CT.
4. Types of magnet used in MRI.
5. Pulse sequences in MRI.
6. Gamma Camera.
7. Physical principle of PET.
8. PACS.

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

1. Advantages of compression in mammography.
2. Mammographic X-ray film.
3. Artifacts in ultrasound imaging (any one).
4. CT Number.
5. CTDI.
6. Larmour Frequency.
7. T1 weighted image.
8. Advantages of MRI over CT images.
9. Give physical properties of any one of radioactive isotope used in Nuclear Medicine.
10. Image fusion.

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

[LR 1220] DECEMBER 2020 Sub. Code: 1836
(AUGUST 2020 EXAM SESSION)

BACHELOR IN RADIOLOGY IMAGING TECHNOLOGY
THIRD YEAR – (Regulation from 2014-2015)
PAPER I – EQUIPMENTS OF MODERN IMAGING MODALITIES
Q.P. Code: 801836

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

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

1. Describe in detail about the construction and working of Mammographic X-ray equipment.
2. Describe in detail about the physical principle of CT image formation.
3. Explain the various parts of MRI equipment.

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

1. US Transducer.
2. Properties of Ultrasound.
3. Multidetector CT.
4. CT Artifacts.
5. Pulse sequences in MRI.
6. Bioeffects of MRI.
7. Digital Substraction Angiography.
8. PET-CT.

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

1. AEC.
2. Mammographic cassette.
3. B-mode Ultrasound.
4. Doppler effect.
5. Pitch.
6. CT Number.
7. T2 weighted image.
8. Zebra Artifact in MRI.
9. Half life of Radioactive isotope.
10. Advantages of Gamma Camera over Rectilinear Scanner.

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

[AHS 0122] JANUARY 2022 Sub. Code: 1836
(FEBRUARY 2021 & AUGUST 2021 EXAM SESSION)

B.Sc. RADIOLOGY IMAGING TECHNOLOGY
THIRD YEAR – (Regulation from 2014-2015)
PAPER I – EQUIPMENTS OF MODERN IMAGING MODALITIES
Q.P. Code: 801836

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

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

1. Discuss in detail about CT equipment.
2. Describe in detail the various parts of a mammography equipment.
3. Discuss about Radio frequency coils. Explain the various signal encoding for image formation in MRI.

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

1. CR reader.
2. Nuclear Imaging in myocardial perfusion.
3. Three artifacts in CT.
4. Radio Isotope generator.
5. Factors affecting image quality in CT.
6. Contrast media used in MRI.
7. Single photon Emission computer tomography (SPECT).
8. Types of magnet used in MRI.

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

1. What is wrap around artifact in MRI?
2. What are the uses of PACS?
3. Role of ultrasound in obstetrics.
4. Scintillation detector.
5. Tesla.
6. Acoustic coupling.
7. What is window width and window level.
8. Gradient coil.
9. TR and TE in MRI.
10. CT Number.

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

[AHS 0922] SEPTEMBER 2022 Sub. Code: 1836
(FEBRUARY 2022 & AUGUST 2022 EXAM SESSIONS)

B.Sc. RADIOLOGY IMAGING TECHNOLOGY
THIRD YEAR – (Regulation from 2014-2015)
PAPER I – EQUIPMENTS OF MODERN IMAGING MODALITIES
Q.P. Code: 801836

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

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

1. Describe computer radiography cassette with adequate diagrams. Image processing in computer radiography system.
2. Describe in detail the function of digital subtraction angiography machine.
3. Image formation in MRI.

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

1. MR Spectroscopy.
2. Photomultiplier tube.
3. Spin echo sequence.
4. Interaction of ultrasound with matter.
5. Multidetector CT.
6. Image intensifier.
7. Basic physics and principles involved in SPECT.
8. Bone densitometry.

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

1. Low dose CT.
2. Flip angle.
3. Bio effects of MRI.
4. What are the types of image reconstruction in CT?
5. CT Cholangiography.
6. High frequency X-ray machines.
7. Compare conventional mammography with digital mammography.
8. CTDI.
9. Anode heel effects.
10. What are the advantages of PET-CT?

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

[AHS 0423] **APRIL 2023** **Sub. Code: 1836**

B.Sc. RADIOLOGY IMAGING TECHNOLOGY
THIRD YEAR – (Regulation 2014-2015 onwards)
PAPER I – EQUIPMENTS OF MODERN IMAGING MODALITIES
Q.P. Code: 801836

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. Explain CT artifacts in detail.
3. Discuss in detail various generations of the CT scanners. Mention the advantages of multi slice CT scanner over conventional CT.

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

1. Larmor Frequency in MRI.
2. Gradient echo sequence.
3. Pulse sequences in MRI.
4. Super conductive magnet.
5. Principle of PET CT.
6. Explain contrast materials in MRI.
7. Ultrasound Transducer.
8. Discuss about two isotopes used as a therapeutic agent in Nuclear Medicine.

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

1. Diffusion Weighted Imaging.
2. Piezo electric effect.
3. Define pitch in CT.
4. Acoustic Coupling agents.
5. MR angiography techniques.
6. CR image plate phosphor.
7. Filtration in X-ray imaging.
8. Mammographic X-ray film.
9. Advantages of MRI over CT images.
10. What is Doppler effect?

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