

[LD 0212]

AUGUST 2013

Sub. Code: 1412

DIPLOMA IN RADIOLOGY IMAGING TECHNOLOGY

SECOND YEAR

**PAPER II – EQUIPMENTS, BASIC TECHNIQUES OF MODERN
IMAGING MODALITIES**

Q.P. Code : 841412

Time : Three Hours

Maximum : 100 marks

Answer ALL questions

I. Elaborate on:

(3 x 10 = 30)

1. Basic principle of CT.
2. Advantages and disadvantages of CT scan and RI scan.
3. Components of a digital Radiographic system.

II. Write notes on:

(10 x 5 = 50)

1. Fundamental of MRI scan.
2. Digital Radiography.
3. Structure of Image plate – CR.
4. Principles of Ultra sound.
5. Different types of transducers.
6. CT contrast media.
7. Write briefly about mammography.
8. What are the indication for ST Brain.
9. Basic elements of a CWD instrument.
10. Procedure of formation of CT image.

III. Short Answers on:

(10 x 2 = 20)

1. CT numbers.
2. CR Reader.
3. What is Doppler effect.
4. Multislicue CT.
5. Defectors.
6. Piezoelectric effect.
7. Advantage of Digital Image storage.
8. What is Tesla.
9. Uses of Ultrasound in Andenatal scan.
10. Basic types of magnets.

[LE 0212]

FEBRUARY 2014

Sub. Code: 1412

DIPLOMA IN RADIOLOGY IMAGING TECHNOLOGY

SECOND YEAR

**PAPER II – EQUIPMENTS, BASIC TECHNIQUES OF MODERN
IMAGING MODALITIES**

Q.P. Code : 841412

Time : Three Hours

Maximum : 100 marks

Answer ALL questions

I. Elaborate on:

(3 x 10 = 30)

1. List the advantages and disadvantages of CT scan and RI scan.
2. List the Principles of MRI.
3. Explain the principles of mammography.

II. Write notes on:

(10 x 5 = 50)

1. Explain about Computed Radiography.
2. List the various principles of Ultra sound.
3. What are the components of a digital Radiographic system?
4. Explain the principles of CT.
5. What are the indications for ST brain?
6. Explain about the magnets used in MRI.
7. Compare: Computed radiography vs digital radiography.
8. Explain about the construction of an ultrasound probe.
9. Explain about the various generations of CT.
10. List the characteristics of ultrasound.

III. Short Answers on:

(10 x 2 = 20)

1. Explain about CT number?
2. What is Tesla?
3. Explain about Piezoelectric effect.
4. List the advantages of Digital Image storage.
5. Explain about Interaction of ultrasound with matter.
6. Explain briefly about high and low field strength MRI.
7. Explain about display of less dense structures on CT
8. How is ultrasound generated?
9. List the factors affecting MRI image quality.
10. What is CT contrast media?

[LF 0212]

AUGUST 2014

Sub. Code: 1412

DIPLOMA IN RADIOLOGY IMAGING TECHNOLOGY

SECOND YEAR

**PAPER II – EQUIPMENTS, BASIC TECHNIQUES OF MODERN
IMAGING MODALITIES**

Q.P. Code : 841412

Time : Three Hours

Maximum : 100 marks

Answer ALL questions

I. Elaborate on:

(3 x 10 = 30)

1. Basic Principle of MRI.
2. Physical Principles of CT scan equipment.
3. Interactions between Ultrasound and matter.

II. Write notes on:

(10 x 5 = 50)

1. Procedure of formation of CT image.
2. Characteristics of Ultrasound.
3. Spiral CT.
4. Complication due to Contrast Media.
5. CT Number.
6. Detectors.
7. Describe in detail MRI Brain imaging.
8. Principle of Mammography.
9. Structure of Photo-Stimulable Phosphor.
10. Types of Magnet used in MRI Scan.

III. Short Answers on:

(10 x 2 = 20)

1. What is Doppler effect?
2. Uses of Ultrasound in Antenatal scan.
3. What is Tomography?
4. Transmitter.
5. Scintillation detectors.
6. Piezoelectric Effect.
7. Motion Artefacts.
8. 3D Ultrasound.
9. What is Tesla?
10. Superconducting Magnet.

[LH 0815]

AUGUST 2015

Sub. Code: 1412

DIPLOMA IN RADIOLOGY IMAGING TECHNOLOGY

SECOND YEAR

**PAPER II – EQUIPMENTS, BASIC TECHNIQUES OF MODERN
IMAGING MODALITIES**

Q.P. Code: 841412

Time : Three Hours

Maximum : 100 marks

Answer ALL questions

I. Elaborate on:

(3 x 10 = 30)

1. MRI Instrumentation.
2. Techniques of CT Enteroclysis.
3. Basic Principle of Ultrasonogram and discuss about interaction of ultrasound with matter.

II. Write notes on:

(10 x 5 = 50)

1. Advantages and disadvantages of digital radiography over conventional radiography.
2. Dual source CT Scan.
3. Artifacts in MRI Scan.
4. Safety aspects in CT Study.
5. Type of Detectors in CT Scan.
6. Indirect digital radiography.
7. Explain Ultrasound display modes.
8. Gradient coils in MRI.
9. Basic principle of Mammography.
10. Basics of Slip ring technology and advantages.

III. Short Answers on:

(10 x 2 = 20)

1. Pitch.
2. MRI Screening form.
3. Tomography.
4. Uses of High frequency Probes in Ultrasound scan.
5. Name two contrast agents used in MRI.
6. Beam hardening Artifact.
7. Doppler effect.
8. Cryogenic system in MRI.
9. Dual energy Chest X Ray.
10. Explain FLAIR, STIR.

[LI 0216]

FEBRUARY 2016

Sub. Code: 1412

DIPLOMA IN RADIOLOGY IMAGING TECHNOLOGY

SECOND YEAR

**PAPER II – EQUIPMENTS, BASIC TECHNIQUES OF MODERN
IMAGING MODALITIES**

Q.P. Code: 841412

Time : Three Hours

Maximum : 100 marks

Answer ALL questions

I. Elaborate on:

(3 x 10 = 30)

1. Write briefly about the evolution of MRI Scan equipment.
2. Explain about CT protocol for a patient with acute stroke.
3. Basic Principle of Digital Radiography system.

II. Write notes on:

(10 x 5 = 50)

1. Explain preparation and planning for CT Coronary angiography.
2. Explain Ultrasound display modes.
3. HRCT of temporal bone.
4. Spin echo sequence.
5. Type of coils used in MRI.
6. MR angiography methods.
7. Computer radiography.
8. Contrast medias used in MRI Scan.
9. Artifacts in CT Scan.
10. Safety aspects in MRI Study.

III. Short Answers on:

(10 x 2 = 20)

1. Type of Probes used in Ultra sonogram.
2. Specify some CT guided procedures.
3. Windows and Level.
4. Hounsfield units.
5. Gauss.
6. Piezoelectric effect.
7. Faraday cage.
8. PET CT.
9. Anomaly scan.
10. Sono mammogram.

DIPLOMA IN RADIOLOGY IMAGING TECHNOLOGY

SECOND YEAR

**PAPER II – EQUIPMENTS, BASIC TECHNIQUES OF MODERN
IMAGING MODALITIES**

Q.P. Code: 841412

Time : Three hours

Maximum: 100 Marks

Answer **ALL** questions.

I. Elaborate on:

(3 x 10 = 30)

1. Principle of CT scan and explain the types of generation.
2. Principles of MRI.
3. Explain the DR system.

II. Write notes on:

(10 x 5 = 50)

1. Different types of transducer.
2. Spiral CT.
3. Superconducting magnet.
4. Construction of ultrasound probe.
5. Principle of mammography.
6. Advantages of CR and DR.
7. CT Detector.
8. Difference between CNR and SNR.
9. Explain the CR principle.
10. Describe the MRI contrast studies.

III. Short answers on:

(10 x 2 = 20)

1. Doppler Effect.
2. What is Tesla?
3. Mammography grid.
4. Types of Doppler studies.
5. Explain the Mammography film.
6. Write different basic MRI sequence.
7. CT dose index.
8. Name two artifacts in MRI.
9. Name the crystal used in US.
10. Quality control and pediatric maintains.

DIPLOMA IN RADIOLOGY IMAGING TECHNOLOGY
SECOND YEAR
PAPER II – EQUIPMENTS, BASIC TECHNIQUES OF MODERN
IMAGING MODALITIES

Q.P. Code: 841412

Time : Three Hours

Maximum : 100 Marks

Answer All questions.

I. Elaborate on:

(3 x 10 = 30)

1. What is the principle of ultrasound scan and describe the method of production of ultrasound and their physical characteristics?
2. Explain the CR system.
3. First generation CT.

II. Write Notes on:

(10 x 5 = 50)

1. Describe the MRI contrast studies.
2. CCD technology in DR system.
3. Define the acoustic impedance in US.
4. X-ray tube design in mammography.
5. Explain the digital radiography.
6. Types of magnet used in MRI scan.
7. Image quality in CT.
8. Explain in relaxation of MRI.
9. Describe the interaction of ultrasound with matter.
10. Explain the CR processing image methods.

III. Short Answers on:

(10 x 2 = 20)

1. Types of pulse sequence in MRI.
2. Limitation of spiral CT.
3. CT define larmor frequency.
4. What is HU?
5. Piezoelectric effect.
6. Purpose of cathode ray tube in CT.
7. Type of DR system.
8. How are dense structures displayed in CT? How are less dense structure displayed on CT?
9. Explain the compression paddle in mammography.
10. Purpose of amorphous silicon.

DIPLOMA IN RADIOLOGY IMAGING TECHNOLOGY
SECOND YEAR
PAPER II – EQUIPMENTS, BASIC TECHNIQUES OF MODERN
IMAGING MODALITIES

Q.P. Code: 841412

Time : Three Hours

Maximum : 100 Marks

Answer All questions.

I. Elaborate on:

(3 x 10 = 30)

1. Explain the basic principle of Computed Tomography.
2. Explain the different types of Digital Radiography.
3. Explain the interaction of ultrasound with matter.

II. Write Notes on:

(10 x 5 = 50)

1. Principle of Computed Radiography.
2. Compression in mammography.
3. Various modes of ultrasound imaging.
4. CT x-ray tube.
5. Pulse sequences used in MRI.
6. Magnets used in MRI.
7. MRI Artifacts.
8. T2 weighted imaging.
9. Target and filter used in mammography.
10. Mammographic cassette.

III. Short Answers on:

(10 x 2 = 20)

1. Phosphor used in computed radiography.
2. Hounsfield unit.
3. Different types of probes used in ultrasonogram.
4. Beam Hardening artifact.
5. Tesla.
6. Contraindications of MRI.
7. Name contrast agent used in MRI.
8. Tomography.
9. Uses of RF coils in MRI.
10. Multislice CT.

DIPLOMA IN RADIOLOGY IMAGING TECHNOLOGY
SECOND YEAR
PAPER II – EQUIPMENTS, BASIC TECHNIQUES OF MODERN
IMAGING MODALITIES

Q.P. Code: 841412

Time : Three Hours

Maximum : 100 Marks

Answer All questions.

I. Elaborate on:

(3 x 10 = 30)

1. Explain with diagram, the construction of mammographic equipment.
2. Explain the various generations of CT scanner.
3. Explain various types of magnets used in MRI.

II. Write Notes on:

(10 x 5 = 50)

1. Explain the construction and working of CR reader.
2. Indirect digital radiography.
3. Construction of ultrasound probe.
4. Detectors used in CT.
5. T1 and T2 relaxation time.
6. Proton density imaging.
7. Artifacts in ultrasound imaging.
8. Advantages of MR imaging over CT imaging.
9. Contraindications of MRI.
10. CT angiography.

III. Short Answers on:

(10 x 2 = 20)

1. Advantages of computed radiography.
2. CCD technology.
3. Mammographic film.
4. CT Number.
5. Pitch.
6. Larmour frequency.
7. Why hydrogen is widely used in MR imaging?
8. Doppler effect in ultrasound.
9. Piezoelectric effect.
10. Advantages of Digital Image Storage.

DIPLOMA IN RADIOLOGY IMAGING TECHNOLOGY

SECOND YEAR

**PAPER II – EQUIPMENTS, BASIC TECHNIQUES OF MODERN
IMAGING MODALITIES**

Q.P. Code: 841412

Time : Three Hours

Maximum : 100 Marks

Answer All questions.

I. Elaborate on:

(3 x 10 = 30)

1. Explain the basic principle of Magnetic Resonance Imaging.
2. Explain the principle and equipment of computed radiography.
3. Explain the principle of ultrasound image formation and various modes of ultrasound imaging.

II. Write Notes on:

(10 x 5 = 50)

1. Direct Digital Radiography.
2. Picture Archival and Communication Systems.
3. Mammographic X-ray tube.
4. Properties of ultrasound.
5. Generations of CT.
6. Magnets used in MRI.
7. CT Number.
8. T1 weighted imaging.
9. CT artifacts.
10. CT angiography.

III. Short Answers on:

(10 x 2 = 20)

1. Advantages of computed radiography.
2. Piezoelectric effect.
3. Grid used in mammography.
4. Doppler effect in ultrasound.
5. Larmour frequency.
6. Tesla.
7. Contraindications of MRI.
8. Spiral CT.
9. Scintillation detector.
10. Uses of high frequency probes in ultrasound scan.

DIPLOMA IN RADIOLOGY IMAGING TECHNOLOGY

SECOND YEAR

**PAPER II – EQUIPMENTS, BASIC TECHNIQUES OF MODERN
IMAGING MODALITIES**

Q.P. Code: 841412

Time : Three Hours

Maximum : 100 Marks

Answer All questions.

I. Elaborate on:

(3 x 10 = 30)

1. Explain the various generations of CT scanner.
2. Explain the principles of mammography.
3. Interactions between Ultrasound and matter.

II. Write Notes on:

(10 x 5 = 50)

1. T1 and T2 relaxation time.
2. Proton density imaging.
3. CT Number.
4. Hounsfield unit.
5. Artifacts in MRI Scan.
6. Safety aspects in CT Study
7. Explain Ultrasound display modes.
8. Gradient coils in MRI.
9. MR angiography methods.
10. Artifacts in CT Scan.

III. Short Answers on:

(10 x 2 = 20)

1. Type of Probes used in Ultra sonogram.
2. Specify some CT guided procedures.
3. Phosphor used in computed radiography.
4. Name two contrast agents used in MRI.
5. Beam hardening Artifact.
6. Dual energy CT scan.
7. Explain FLAIR, STIR.
8. Piezoelectric effect.
9. Faraday cage.
10. PET CT.

DIPLOMA IN RADIOLOGY IMAGING TECHNOLOGY**SECOND YEAR****PAPER II – EQUIPMENTS, BASIC TECHNIQUES OF MODERN
IMAGING MODALITIES***Q.P. Code: 841412***Time : Three Hours****Maximum : 100 Marks****Answer All questions.****I. Elaborate on:****(3 x 10 = 30)**

1. Explain the First generation of CT scan & list the advantages and disadvantages of CT scan and MRI scan.
2. Explain the DR system.
3. Basic Principle of Ultrasonogram and discuss about interaction of ultrasound with matter.

II. Write Notes on:**(10 x 5 = 50)**

1. Dual source CT Scan.
2. Advantages and disadvantages of digital radiography over conventional radiography.
3. Safety aspects in CT Study.
4. HRCT of temporal bone.
5. Type of coils used in MRI.
6. Computer radiography.
7. Contrast medias used in MRI Scan.
8. Advantages of CR and DR.
9. CT Detector.
10. Different types of transducer.

III. Short Answers on:**(10 x 2 = 20)**

1. Mammography grid.
2. Name the crystal used in US.
3. PET CT.
4. Anomaly scan.
5. Define Pitch.
6. Spiral CT.
7. Scintillation detector.
8. Uses of high frequency probes in ultrasound scan.
9. Advantages of Digital Image Storage.
10. Why hydrogen is widely used in MR imaging?

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

[LR 1220]

**DECEMBER 2020
(AUGUST 2020 EXAM SESSION)**

Sub. Code: 1412

**DIPLOMA IN RADIOLOGY IMAGING TECHNOLOGY
SECOND YEAR – (Regulation from 2010-2011)
PAPER II – EQUIPMENTS, BASIC TECHNIQUES OF MODERN IMAGING MODALITIES
*Q.P. Code: 841412***

Time: Three Hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Describe the basic principle of MRI. Discuss briefly about T1 and T2. Relaxation and its utility in MRI.
2. Explain the CR system. Advantages of CR and DR.
3. Explain the basic principle of Mammography. Describe in detail about parts of Mammography machine.

II. Write Notes on:

(10 x 5 = 50)

1. Discuss briefly about Helical / Spiral CT.
2. Discuss the principle of USG Image formation.
3. Describe the physical principal of Multidetector CT.
4. What is Digital Mammography?
5. What are the Factors controlling CT Image Quality?
6. What is Radiation dose in CT?
7. Explain about FLIP Angle.
8. Mammographic Cassette.
9. Discuss briefly about Superconducting MRI magnet.
10. Construction of Transducer.

III. Short Answers on:

(10 x 2 = 20)

1. What is Tele-radiology?
2. What is Phosphor Reader?
3. RF Coils.
4. Name the types of USG Image Displays.
5. What is Fringe field?
6. Name four Specialized MR Sequences.
7. Name four Nuclei in Human body suitable for MR Imaging.
8. What is GRE?
9. TR and TE in MRI.
10. Name four Artifacts in CT.

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

[LR 1220]

**DECEMBER 2020
(AUGUST 2020 EXAM SESSION)**

Sub. Code: 1432

**DIPLOMA IN RADIOGRAPHY AND IMAGING TECHNOLOGY
SECOND YEAR – (Regulation from 2018-2019)
PAPER II – EQUIPMENTS, BASIC TECHNIQUES OF MODERN IMAGING MODALITIES
Q.P. Code: 841432**

Time: Three Hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. List the Principles of MRI.
2. What are the Techniques followed in CT Enteroclysis.
3. First generation CT.

II. Write notes on:

(10 x 5 = 50)

1. Explain about the Acoustic Impedance used in Ultrasound.
2. Explain about the quality of a CT image.
3. Spin Echo Sequence.
4. Diffusion weighted imaging.
5. What is the MRI protocol used for Stroke patients.
6. Write a note on CT Angiography.
7. What is meant by Proton Density Imaging.
8. Advantages of CR and DR.
9. Write a note on CR image reader and its advantages and disadvantages.
10. Compression in Mammography.

III. Short answers on:

(10 x 2 = 20)

1. Doppler Effect.
2. Tesla.
3. Dual energy chest X-Ray uses.
4. Characteristic Radiation.
5. PACS.
6. Invivo Dosimetry.
7. Ring Artefacts.
8. What is meant by T2 Weighted Imaging?
9. What is meant by Compression Paddle followed in Mammography?
10. Define CCD Technology.
