**[LP 0819]** AUGUST 2019 **Sub. Code: 1843**

**B.Sc. RADIOGRAPHY & IMAGING TECHNOLOGY**
**(New Syllabus 2018-2019)**

**FIRST YEAR**

**PAPER III – RADIOGRAPHY EQUIPMENTS, MAINTENANCE AND QUALITY CONTROL RELATED TO X-RAY ONLY**

***Q.P. Code: 801843***

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

**Answer all questions**

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

1. Describe in detail, principle of image formation in Computed Radiography.
2. Describe with neat diagram, construction of X-ray mammography equipment.
3. Describe with neat diagram, various generations of computed tomography.

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

1. Construction of stationary anode X-ray tube.
2. Battery operated X-ray unit.
3. Automatic Brightness Control.
4. PACS.
5. Mammographic cassette and film.
6. Intraoral Dental X-ray unit.
7. Theory of X-ray Tomography.
8. CT detectors.

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

1. Inherent filtration.
2. Heat dissipation methods in X-ray tube.
3. Portable X-ray machine.
4. Disadvantages of direct fluoroscopy.
5. Fluoroscopic Table.
6. Charge coupled device.
7. Properties of tungsten.
8. OPG.
9. CT number.
10. Partial Volume artifact.

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**[LQ 0220]** FEBRUARY 2020 **Sub. Code: 1843**

**B.Sc. RADIOGRAPHY & IMAGING TECHNOLOGY**
**(New Syllabus 2018-2019)**

**FIRST YEAR**

**PAPER III – RADIOGRAPHY EQUIPMENTS, MAINTENANCE AND QUALITY CONTROL RELATED TO X-RAY ONLY**

***Q.P. Code: 801843***

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

**Answer all questions**

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

1. Describe with neat diagram, the construction and working of image intensifier.
2. Describe with neat diagram, the construction and working of rotating anode x-ray tube.
3. Describe in detail, intraoral dental radiographic unit and orthopantomography x-ray unit.

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

1. Theory of conventional tomography.
2. Direct fluoroscopy and its disadvantages.
3. Television camera tube.
4. Direct digital radiography.
5. Construction of CR image reader.
6. Mammographic x-ray tube.
7. Multisection tomography.
8. CT Artifacts (any three).

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

1. Anode heel effect.
2. Grid controlled x-ray tube.
3. Capacitor discharge x-ray tube.
4. Fluoroscent screen.
5. Digital mammography.
6. Photostimulable luminiscence.
7. Advantages of PACS.
8. Dental x-ray film.
9. Xenon gas detector.
10. Slip ring technology.

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

**[AHS 0321] MARCH 2021 Sub. Code: 1843**

**(AUGUST 2020 EXAM SESSION)**

**B.Sc. RADIOGRAPHY AND IMAGING TECHNOLOGY**

**FIRST YEAR (Regulation 2018-2019)**

**PAPER III – RADIOGRAPHY EQUIPMENTS, MAINTENANCE AND QUALITY CONTROL RELATED TO X-RAY ONLY**

***Q.P. Code : 801843***

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

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

1. Describe with neat diagram, the construction and working of rotating anode x-ray tube.
2. Describe with neat diagram, various types of flat panel detectors in digital radiography.
3. Describe in detail, various parts of CT equipment.

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

1. Grid controlled x-ray tube.
2. Capacitor discharge x-ray unit.
3. Direct fluoroscopy and its disadvantages.
4. CR image reader.
5. Mammographic x-ray tube.
6. OPG x-ray unit.
7. Theory of conventional tomography.
8. Image reconstruction in CT.

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

1. Line focus principle.
2. Dual focus and choice of focus.
3. Battery operated x-ray unit.
4. Spot film device.
5. Cine fluoroscopy.
6. HTC grid.
7. Multisection cassette.
8. Types of tomographic movement.
9. First Generation CT.
10. Beam Hardening Artifact.

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

**[AHS 0422] APRIL 2022 Sub. Code: 1843**

**(FEBRUARY 2021 & AUGUST 2021 EXAM SESSIONS)**

**B.Sc. RADIOGRAPHY AND IMAGING TECHNOLOGY**

**FIRST YEAR (Regulation 2018-2019)**

**PAPER III – RADIOGRAPHY EQUIPMENTS, MAINTENANCE AND QUALITY CONTROL RELATED TO X-RAY ONLY**

***Q.P. Code: 801843***

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

**Answer All questions**

**I. Elaborate on : (3X10=30)**

1. What is a rectifier? Discuss about the different types of rectifiers.
2. Discuss in detail about the construction and working of a dental x-ray unit and write about its applications.
3. Write down the principle of image formation in a DR system and explain in detail about the various components in it.

**II. Write Notes on : (8X5=40)**

1. Autotransformer.
2. Digital Subtraction Angiography.
3. Methods of cooling used in X-ray units.
4. Compare and contrast direct and indirect fluoroscopy.
5. Principle of image formation in a mammography unit.
6. Advantages of DR over CR.
7. Spiral CT.
8. Stationary anode x-ray tube.

**III. Short Answers on: (10X3=30)**

1. Focal spot.
2. Properties of tungsten.
3. Inherent filtration.
4. Two limitations of mobile x-ray unit.
5. Write down any two quality assurance tests for X-ray unit.
6. Name any two artifacts commonly seen in CT images.
7. List down the factors that affect the image in tomography.
8. Advantages of CR.
9. Write down the factors that affect thermionic emission.
10. Name any two detector materials used in CT units.

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

**[AHS 1122]** **NOVEMBER 2022** **Sub. Code: 1843**

**B.Sc. RADIOGRAPHY & IMAGING TECHNOLOGY**
**FIRST YEAR (Regulation 2018-2019)**
**PAPER III – RADIOGRAPHY EQUIPMENTS, MAINTENANCE AND QUALITY CONTROL RELATED TO X-RAY ONLY**
***Q.P. Code: 801843***

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

**Answer All questions**

**I. Elaborate on :** **(3X10=30)**

1. What is fluoroscopy? Discuss in detail about its various types and their advantages.
2. Discuss in detail about the construction and working of a modern X-ray unit with suitable diagram.
3. Write in detail about the developments in CT technology.

**II. Write Notes on :** **(8X5=40)**

1. Working of full wave rectifier with suitable circuit.
2. Discuss in detail about tube rating.
3. Discuss about the types of transformer.
4. Mammography.
5. Discuss about the advantages and disadvantages of DR systems.
6. Mobile X-ray unit.
7. What is quality assurance? Write down the maintenance procedure for X-ray unit.
8. Principle of Angiography.

**III. Short Answers on:** **(10X3=30)**

1. Filament current.
2. What is a grid? How it is used?
3. Filtration.
4. Heat dissipation methods in X-ray tube.
5. How will you improve the quality of mammographic image?
6. Write about the limitations of dental X-ray unit.
7. Continuous spectra.
8. List out the factors that affect the X-ray quality.
9. Write any two points about the maintenance of cath lab equipments.
10. Heel effect.

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

**[AHS 0423]** **APRIL 2023** **Sub. Code: 1843**

**B.Sc. RADIOGRAPHY & IMAGING TECHNOLGOY**
**FIRST YEAR (Regulation 2018-2019 onwards)**
**PAPER III – RADIOGRAPHY EQUIPMENTS, MAINTENANCE AND QUALITY CONTROL RELATED TO X-RAY ONLY**
***Q. P. Code: 801843***

**Time: Three hours** **Maximum : 100 Marks**

**Answer ALL Questions**

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

1. Describe with neat diagram, the construction and working of Image Intensifier.
2. Describe in detail, the principle of image formation in Computed Tomography.
3. Describe in detail, Intraoral Dental Radiographic unit and Orthopantomography X-ray unit.

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

1. Construction of rotating anode X-ray tube.
2. Portable X-ray unit.
3. Image Intensifier Tube.
4. Direct digital radiography.
5. Construction of CR image reader.
6. Mammographic X-ray tube.
7. Multisection Tomography.
8. Explain three CT Artifacts.

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

1. Anode Heel effect.
2. Grid Controlled X-ray tube.
3. Capacitor discharge X-ray tube.
4. Fluorescent screen.
5. Digital mammography.
6. Photostimulable Phosphor.
7. Advantages of PACS.
8. Dental X-ray film.
9. Detector used in DR.
10. Target used in mammography unit.

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

**[AHS 1123] NOVEMBER 2023 Sub. Code: 1843**

**B.Sc. RADIOGRAPHY & IMAGING TECHNOLOGY**
**FIRST YEAR (Regulation 2018-2019 onwards)**
**PAPER III – RADIOGRAPHY EQUIPMENTS, MAINTENANCE AND QUALITY CONTROL RELATED TO X-RAY ONLY**
***Q.P. Code: 801843***

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

**Answer All questions**

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

1. Write in detail about the principle of image formation in CR and write down its advantages and disadvantages.
2. Discuss in detail about the construction and working of a mobile X-ray unit and add a note on its limitations.
3. Write down the principle and function of a transformer and discuss about its various types.

**II. Write Notes on : (8X5=40)**

1. Working of half wave rectifier with suitable circuit diagram.
2. Image reconstruction in CT scanner.
3. Differences between Dental and Conventional X-ray unit.
4. Direct fluoroscopy.
5. Discuss about the principle of image formation in tomography.
6. Types of DR and their advantages.
7. Write about any three quality assurance tests for X-ray units along with their tolerance Values.
8. Write about ABC.

**III. Short Answers on: (10X3=30)**

1. Automatic exposure control.
2. Name the target used in X-ray unit and write down its properties.
3. Compound filters.
4. CT dose index.
5. Dental films.
6. Write about the DR detector.
7. What are the target materials used in mammography unit? Why are they used?
8. List out the factors that affect the X-ray quality.
9. Write down the advantages of DSA.
10. Hounsfield Unit.

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

**[AHS 0424]** **APRIL 2024** **Sub. Code: 1843**

**B.Sc. RADIOGRAPHY & IMAGING TECHNOLOGY**
**FIRST YEAR (Regulation 2018-2019 onwards)**
**PAPER III – RADIOGRAPHY EQUIPMENTS, MAINTENANCE AND QUALITY CONTROL RELATED TO X-RAY ONLY**
***Q.P. Code: 801843***

**Time: Three Hours** **Answer All questions** **Maximum : 100 Marks**

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

1. Explain construction and working of Digital Radiography.
2. Explain modern X-ray (rotating anode) tube with neat diagram.
3. What is Fluoroscopy? Explain its types with neat diagram.

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

1. What is Grid? Explain its types.
2. Explain construction and working of Image Intensifier.
3. Explain the principle and working of Mammography.
4. Explain the generation of CT.
5. Digital subtraction angiography.
6. Explain about the Image processing and storage in CT.
7. Explain about Heat dissipation methods in X-ray machine.
8. Automatic brightness control in fluoroscopy.

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

1. Molybednum target.
2. DICOM.
3. Type of equipment used in Dental Radiography.
4. Advantages of flat panel fluoroscopy.
5. Motion artifact and ring artifact.
6. Space charge effect.
7. What are the advantages of CR?
8. Pixel and Voxel.
9. Inherent filtration.
10. Safety steps in Fluoroscopy.

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

**[AHS 1125]** **NOVEMBER 2025** **Sub. Code: 1843**

**B.Sc. RADIOGRAPHY & IMAGING TECHNOLOGY**
**FIRST YEAR (Regulation 2018-2019 onwards)**
**PAPER III – RADIOGRAPHY EQUIPMENTS, MAINTENANCE AND QUALITY CONTROL RELATED TO X-RAY ONLY**
***Q.P. Code: 801843***

**Time: Three Hours** **Answer All questions** **Maximum : 100 Marks**

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

1. Explain in detail about the Angiography and its types.
2. Describe in detail the various parts of a CT equipments.
3. Discuss in detail the Digital Radiography.

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

1. Explain the principle of Coolidge tube.
2. Mention any three generation in CT.
3. Focussing cup.
4. Define Filters and types.
5. Explain about the types of Radiation.
6. Write in detail about Beam Alignment test.
7. Write about OPG.
8. CCTV uses in fluoroscopy equipment.

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

1. Define Mammotomogram.
2. CT-Couch.
3. What is QA?
4. Grid ratio.
5. Spiral volume Artifact.
6. ALARA principle.
7. Tele Radiology.
8. Space charge effect.
9. Leakage Radiation.
10. Radiation dose limits for the occupational worker.

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