



Jharkhand State Paramedical Council

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SYLLABUS OF DIPLOMA IN X-RAY/CT SCAN/USG/MRI TECH THEORY PAPER -II (PART A)

X-Ray

- Construction of X-ray tubes,
- Filament design, Anode Design,
- Methods of heat dissipation,
- Heat Unit, Tube rating charts.
- Three phase X-ray generators.
- Common causes of X-ray tube failure.
- Heat effect,
- Line Focus,
- Principle,
- Special Radiographic Techniques,
- Tomography,
- Miniature X-ray etc.
- Radiographic factors, Grid and Grid parameters,
- Grid faults,
- Layout of X-ray Installation.

CT-Scan

- Construction of X-ray tubes,
- Filament design, Anode Design,
- Methods of heat dissipation, Heat Unit,
- Tube rating charts,
- Basic Principles of CT-Imaging,
- Linear Attenuation Coefficient,
- CT-number, CT-scanner of various generations. CT- detectors,
- Collimators,
- Reconstruction techniques,
- Spiral Scan Pitch Ratio,
- CT-artifacts,
- Layout of CT-Installation.

USG

- Basic Principles of USG Imaging,
- Interaction between Ultrasound and Matter,
- Transducers, Fresnel and Fraunhofer zone,
- Q-factor, Resolution, Resonant Frequency,
- Mode of Ultrasonic display (A, TM, B-mode),
- Artifact in USG Imaging, Doppler effect,
- Doppler shift equation and their application.

MRI

- Basic Principle of MR imaging,
- MRI parameters, Spin density, T1-Relaxation time, T2-Relaxation time,
- Spin Echo Techniques, T1W, T2W, SDW Imaging,
- Inversion Recovery,
- Gradient Echo imaging Techniques,
- Slice selection, Phase and Frequency encoding,
- Components of MRI system, MRI artifacts, MRI-safety.



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PAPER -I (PART- A) [BASIC MEDICAL SCIENCES]

Must develop some skills and learn common medical terminology.

Hospital awareness -

General patient care-

- Patients caring (Knowledge of nursing of patient)
- Vital signs.
- Admission discharge procedure
- Maintenance of records.
- There should be exposure to patient care
- Development of Ethical values and overall professional sense.

Computer awareness -

Computer basics- MS Word/ MS Excel/MS PowerPoint

Internet- Browsing/ Downloading/ Uploading

1. General Foundation course

- Health Disease and Environment.
- Health care delivery system.
- Hospital organization
- Patient related services.
- Registration OPD & IPD

2. Basic Human Science

- Human Anatomy -
- Physiology -
- Bio Chemistry - (Knowledge of different organs with their functions)
- Pathology
- Pharmacology

PAPER -II (PART- B)

Applied Physics

- Discovery, Production of X-rays.
- Modern X-ray tubes and X-ray tube circuits, X-ray spectrum.
- Factors affecting X-ray spectrum.
- Half Value Layer, Filtration etc
- Inverse square Law.
- ALARA principle of Radiation Protection.
- Different radiation monitoring instruments in Radiology & Radiotherapy Departments.
- International recommendations of permissible Exposure Dose limits for Radiation workers and public.
- Dark room, Manual and Automatic Film processing, Density, Contrast, Speed, Image sharpness, Distortion etc. Film fault in radiography and remedy.
- Type of radiographic films.
- Basic of USG/CT SCAN/MRI

Book References

1. Text Book of Radiology for Residents and technicians.
Satis K. Bhargava
Third Edition Scientific Book Co.
2. Manual of Diagnostic Ultrasound (Student Book Depot)
Edited by P.E.S. Palmer.
Published by World Health Organization

5. Knowledge of instruments used in preventive dentistry
6. After care of patients who have had local/general anesthesia.
7. Postoperative instructions and after care of patients who have had local / general anesthesia.
8. Knowledge of biomedical waste management in the department and camp.
9. Indian Dental Association (IDA)&Dental Council of India (DCI)

PROSTHODONTICS

1. Patient care (handling geriatric patients)
2. Introduction to Prosthetic Instruments
3. Handling of impression and restorative materials.
4. Preparing impression casts and models.
5. .
6. Instrumentation and manipulation.

PREVENTIVE DENTISTRY

1. Operatory preparation for Dental procedures
2. Dental Materials Used in Perodontics (Basics Knowledge & Manipulation)
3. Active and passive removable appliances
 - a. Indications
 - b. Knowledge of the instruments and equipment used during the construction of appliances- their use during the procedure.
 - c. Knowledge of the materials used during the procedure and demonstrate their use
4. Advice to be given to patients on the care of appliances

ORTHODONTICS & DENTOFACIAL ORTHOPEDICS

1. Explain the function, need and duration of retention in treating misaligned teeth.
2. Orthodontics Records
3. Effective methods of clinical photography
4. The types of dental x rays and their relevance in orthodontics treatment
5. An effective system for the storage of orthodontic of study models
6. The chairside procedure for the production of study models
7. Orthodontics appliances
8. Active and passive removable appliances
9. Identify the instruments and equipment used during the construction of appliances, describe and demonstrate their use during the procedure.
10. Identify the materials used during the procedure and demonstrate their use.
11. Explain the nature of the advice given to patients on the care of appliances

