



Jharkhand State Paramedical Council

RIMS Campus, Bariatu, RANCHI 834009

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Type a text of document save the document. Align the text with different formats. Align the text with different formats using Microsoft Word. Inserting a table ensuring Proper alignment of the table using MS word.

Module 2: Microsoft Power Point

Preparing a slide show with transition, animation and sound effect using MS – Power point. Customizing the slide show by inserting pictures and tables in the slides using MS – Power Point.

Module 3: Introduction to the Internet

Create an e – mail account. Use the internet to search for a subject of interest.

Theory Paper II (100 Marks)

Part A (50 marks)

Diploma in X-Ray/Radio Imaging Technician

1. Physics of Imaging
2. General radiation Physics
3. X –Ray
 - (i) Basics of radiography
 - (ii) Properties of X-Ray
 - (iii) Production of X-Ray
 - (iv) Fundamentals of X-Ray machine
 - (a) Construction of X-Ray tube and its main component
 - (b) Filament design, Anodes design
 - (c) Method of heat dissipation
 - (d) Heat unit, Tube rating chart
 - (e) Three phase X-Ray generators
 - (f) Common causes of x-ray generators
 - (g) Heat effects
 - (h) Line focus
 - (i) Modern X-Ray tube and X-Ray tube circuit
 - (v) Lay out of X-Ray installation
 - (vi) X-Ray film
 - (a) Composition of x-ray film
 - (b) Types of x-ray film
 - (vii) X-Ray Spectrum – factors effecting x-ray spectrum
 - (viii) Half value layer filtration
 - (ix) Inverse Square law
4. Dark Room technique
 - (i) Structure of Dark room
 - (ii) List of dark room accessories



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- (iii) Loading and unloading of x-ray film
- (iv) Safe light : illumination and testing of safe light
- 5. Radiographic factors
 - (i) Grid
 - (ii) Grid parameters
 - (iii) Grid faults
- 6. Processing of radiographic films
 - (i) Principles of Processing
 - (ii) Manual Processing system
 - (iii) Washing and drying
 - (iv) Film processing solution, its property and maintenance
 - (v) Factors affecting quality in x-ray film processing
 - (vi) Radiographic image
 - (vii) Film density
 - (viii) Film Contrast
 - (ix) Image sharpness and distortion
 - (x) Faults in radiography and its technique
 - (xi) Artifacts
- 7. Exposure factors
 - (i) KVP
 - (ii) mAS
 - (iii) Distance of objective from x-ray tube
 - (iv) Variations in exposure limit
- 8. Pass box
- 9. Dark room digital radiography unit
 - (i) cassettes
 - (ii) Intensifying screen Fluorescent Screen
- 10. Modified x-ray equipments its maintenance and special radiography technique
 - (i) Portable and bedside radiography
 - (ii) Tomography
 - (iii) mammography
 - (iv) mess miniature radiography
 - (v) Dental radiography
 - (vi) Orthopento radiography dental unit (OPG)
 - (vii) X-Ray image intensifier/ radiographic unit
 - (viii) C-Arm image intensifier/radiography unit
 - (ix) Digital radiographic unit
 - (x) Cine fluoroscopic – radiography unit



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(xi) Rapid film changer for serial radiography

11. Regional radiography

(A)General

(i)Head and Neck

(ii) Spine

(iii) Chest

(iv) Abdomen

(v) Penis

(vi) upper limb

(vii) Lower limb

Special

(i)Macro radiography

(ii) Mammo radiography

(iii) Dental radiography

(iv) Orthopentomogram

(v) High kv technique

(vi) Subtraction technique

12. Special diagnostic Proceed

(i)IVP

(ii) Cystography

(iii) Sialography

(iv) Barium Swallow

(v) Bronchography

(vi) Angiography of limbs, carodio vessels

Part B (50 Marks)

1. Computer Tomography (CT)

(i)Basic Principle of CT imaging

(ii) Linear Attenutaion Co efficient

(iii) CT number / CT Scanner of various generations CT detectors

(iv) Collimators

(v) Reconstruction techniques

(vi) Spiral scan pitch ratio

(vi) CT artifacts

(vii) Layout of CT installation

2. Magnetic resonance

(i)Basic principle of MRI

(ii) MRI parameters, spin density



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- (iii) T1 – Relaxation time & T2 – Relaxation time
- (iv) Spin Echo techniques, T1w, T2w, SDw imaging
- (v) Inversion recovery
- (vi) Slice selection, phase and Frequency encoding
- (vii) Components of MRI system
- (viii) MRI artifacts
- (ix) MRI safety

3. Ultra sonography (USG)

- (i) Basic principle of USG imaging
- (ii) Interaction between ultrasound and matter
- (iii) Transducers, Fresnel and Fraunhofer Zone
- (iv) Q factor, resolution and resonant frequency
- (v) Mode of ultrasonic display (A, TM, B mode)
- (vi) Artifacts in USG imaging
- (vii) Doppler effect
- (viii) Doppler shift equation and their application

4. Radiation Hazards and Preventive measures

- (i) During Radiography
- (ii) During fluoroscopy
- (iii) Effect of radiation on human body
- (iv) International recommendation of permissible exposure dose limits for radiation worker & Patients
- (v) Measurement of radiation doses
- (vi) Doses in diagnostic radiology
- (vii) Different radiation monitoring instruments in radiology and radiology department
- (viii) Protective gadgets in radiology department
- (ix) Safety duty of radiologist, radiographer and patients
- (x) ALARA principle of radiation protection

5. General care

- (i) Emergency in radiology department
- (ii) Resuscitation of patients
- (iii) Anesthesia in radiology department
- (iv) Life saving drugs and accessories in radiology department

PRATICAL : (100 MARKS)

VIVA : (100 MARKS)



झारखण्ड राज्य पारामेडिकल परिषद

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सभी डिप्लोमा पाठ्यक्रमों का Paper-I, Common रहेगा, जबकी
विषयवार Paper-II का सिलेबस अलग-अलग रहेगा।
