

HAFEEZ INSTITUTE OF MEDICAL SCIENCES PESHAWAR

F.Sc IMAGING 1st YEAR

S.No	Subject/Papers	Course	Marks	
1.	English – I	According to BISE Peshawar	Theory 100	Practical Nil
2.	Urdu – I	According to BISE Peshawar	100	Nil
3.	Islamiyat	According to BISE Peshawar	50	Nil
4.	Applied Sciences Physics & Chemistry	Teacher Lecture Notes	75	25
5.	Basic Medical Sciences Anatomy & Physiology	Teacher Lecture Notes	50	25
6.	Radiology Techniques-I	Teacher Lecture Notes	75	50

Grand Total= 450 + 100 = 550

HAFEEZ INSTITUTE OF MEDICAL SCIENCES PESHAWAR

PAPER:- APPLIED SCIENCES (PHYSICS & CHEMISTRY)

Physics

1. The nature of Science, Divisions of Science, and Scientific method
2. The Measurement – Metric System, scientific notation, units of mass, length and volume
3. Mechanics – force, equation of motion, laws of motion
4. Gravity – speed, velocity and acceleration, center of gravity, weight and mass
5. Work, Power, Energy
6. Simple machines-principles of machines, friction, levers
7. Density, specific gravity, Archimedes's Principle
8. Pressure – Definition, pressure in hydrostatic fluids, pressure in flowing liquids
9. Gas Laws – Boyle's and Charles laws, gas laws applicable to respiratory process effects of changes in atmospheric pressure on physiology of the human body
10. Heat – nature and measurement, effects of heat, methods of transfer
11. Light – Transmission, reflection and refraction of light, lenses
12. Sound – how it is produced, characteristic, transmission, reflection of sound, echoes, ultrasound
13. Electricity – Atomic structure, free electrons, conductor and insulators, Definition of current, P.D., Resistance, Resistance laws, Ohm's law, circuit, series circuit, parallel circuit, Power and energy.
14. Magnets and Magnets – Properties, magnetic field, magnetic lines of force, electromagnet, magnetic effect of electric current, Motor and generator effect of current, magnetic and electric induction, Transformer.
15. Charge - Coulomb's law, capacitor and capacitance, capacitor in series and in parallel
16. A.C. Definition, RMS value, peak value Sine wave
17. Electromagnetic Radiation – Spectrum, ionization, excitation, Inverse Square law frequency, wave length, terms and their definitions

Practical Physics

- a. To find the unknown force
- b. To find the center of gravity of an irregular shape
- c. To verify the law of reflection
- d. To find the path of light passing through a prism
- e. To find the focal point of a lens
- f. Determine the critical angle of glass using a glass prism
- g. Determine the focal length of convex lens
- h. To find the reflective index of a liquid using a concave mirror
- i. Determine the speed of sound at a room temperature

PAPER:- APPLIED SCIENCES (PHYSICS & CHEMISTRY)

Chemistry

1. Composition of Substance – Atoms and molecules, symbols, formulae, Elements and compounds, chemical formula
2. Chemical Reactions and Equations

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3. Water – Physical and Chemical properties, Deliquescent, efflorescent, hygroscopic substances, solvent properties, Hydrolysis, Water cycle, impurities, hard and soft water
4. Solution – Terms, Solubility, Concentrations, dilutions, properties of solution
5. Acid, Bases, and Salts
6. pH Scale and buffer system
7. Electrolytes and electrolysis
8. Amines and amides
9. Proteins – compositions, properties of amino acids, classifications
10. Carbohydrates
11. Lipids

Practical Chemistry

1. How fitting up a wash bottle is prepared?
2. To pacify the given sample of impose naphthalene crystallization
3. To pacify the given sample of naphthalene by sublimation
4. To determine the melting & boiling point of organic compound
5. To prepare the standard solution of acid or base
6. To prepare a standard solution of exotic acid and with its help standardize a solution of NaOH
7. To prepare approximates N/10 solution of H_2SO_4 determine its exact normality by titrating it against standard N/10 NaOH?
8. To standardize a given solution by direct method
9. To standardize a given solution by indirect method

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Papers:- Basic Medical Sciences (Anatomy & Physiology)

Anatomy

The depth of the subject will only be diagram and labeling of the diagram

Week

Contents

1. Introduction

The study of human cell and functions of organelles, Nucleus, DNA helix, RNA, genetic code, Chromosomes
Cell Division
Mitosis and Meiosis of cell

BASIC TISSUES

- Different Types of tissues
- Connective tissues
- Epithelial tissues
- Muscle tissues
- Nervous tissues
- Blood tissues

The circulatory system-Structure of heart. Different chambers of heart, main arteries arising from the heart and main veins of the heart, branches of arch of aorta, Thoracic aorta, abdominal aorta, main vessels of upper and lower limbs.

Lymphatic System

The Gastro Intestinal Systems

- Mouth
- Pharynx
- Esophagus
- Stomach
- Small Intestine
- Large Intestine
- Accessory Organs (Liver, Spleen, Pancreas & Gall Bladder)

Respiratory Systems

1. Organs of respiration
2. Upper respiratory tract
3. Lower respiratory tract

The Skin

1. Epidermis
2. Dermis
3. Sebaceous glands
4. Nails

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The Nervous System

1. CNS central nervous system
2. Peripheral nervous system
 - i. Different parts of nervous system
 - ii. Structure of cerebrum, mid brain, cerebellum, Pons and medulla oblongata, spinal cord and
 - iii. Autonomic nervous system

The Endo Crinc Glands

Short Description and position of:-

- a. Pituitary gland
- b. Thyroid gland
- c. Parathyroid gland
- d. Adrenal gland
- e. Hormones of Testis
- f. Prostate
- g. Ovaries
- h. Pancreas and Thymus

The urinary system

Structure of kidney, urethra, urinary bladder, prostate gland and ureter. Difference of right and left kidneys.

The Reproductive System

- a. Male reproductive system
- b. Female reproductive system
- c. Different organs of male reproductive system, structure of testis, the scrotum, seminal vesicles, prostate gland, the penis and urethra
- d. Different organs of female are reproductive system, Mammary glands, structure of ovaries, uterus, cervix and vagina.

The Skeleton

Different bones of skull. Bones of upper limbs, lower limb, thorax, pelvis and vertebral column

Structure of individual bones, scapula, humerus, radius, ulna, femur, tibia and hip bones, hands, foot, ribs, sternum, clavicle, sacrum, thyroid, hyoid cricoids.

The Joints

All joints and their movements

Main muscles of body

The Special Senses:

Brief anatomy of eye. Three coats of eye ball. Brief anatomy of ear Outer, middle and inner ear, nose-inner and outer, tongue, salivary glands, skin.

Recommended Books:

Foundations of anatomy and Physiology by Kathleen J.W.Wilson.

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PAPERS:- BASIC MEDICAL SCIENCES (ANATOMY & PHYSIOLOGY)

Physiology

The Physiology of the following topics will consist of brief description of the function of part of the body.

The Cell and its Functions

1. Structure and Functions of a human cell
The cytoplasm and its organelles
Comparison with animal cell
Functional System of the cell
2. Endocytosis & Phagocytosis
Ingestion and digestion by the cell
Functions/Structures of Golgi apparatus
3. Cell Division
Mitochondria and reticulum
Cell reproduction

Tissues and Fluids of Body.

Cardiovascular System (Heart and Circulation)

Description of Heart and vessels (arteries, vein and capillaries)
Cardiac cycle, diastole and systole
Functions of atria and ventricles
Functions of valves
Heart pumping (work output of heart)
Cardiac output, stroke volume etc
Heart sounds

Lymphatic System Function

Respiratory System

Basic mechanism of respiration
Inspiration expiration mechanism
Pulmonary capacities and pulmonary volumes
Respiratory rate and tidal volume definitions
Functions of respiratory pathways (Chemical & Neural Control)
Artificial respiration, mouth breathing
Transport of oxygen and carbon dioxide in the blood and body fluids

Gastro Intestinal Tract.

Ingestion of food, mastication (Chewing)/ Digestion and Swallowing
Functions of stomach, Storage function, mixing of food

Secretions of GIT

Saliva, Salivary glands functions of
Saliva, Gastric Secretion, Functions of
Pancreatic Secretion, Bile Secretion and its function
Secretions of the small intestine, secretion of large intestine, Digestion and absorption of food.

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Metabolism

Introduction to fat and Protein Metabolism

Introduction to Carbohydrates Metabolism, Role of Glucose in Carbohydrate metabolism, Transport of glucose in body tissue, Lipid metabolism transport of lipids in the blood.

Transport from the GIT, and fat deposits, Proteins metabolism basic properties of protein, use proteins for energy, Vitamins and their metabolic role.

Endocrine Glands

Endocrine glands and their hormones

The pituitary hormones and their functions

The thyroid hormone, the adrenocortical hormones

Parathyroid hormones and their functions

Reproductive System

Functions of the male reproductive organs

Functions of the female reproductive system

Testosterone and other male sex hormones

Pregnancy, lactation and female hormones

Special Senses

Introduction to Sensory organs and their function

The eye functions and elements of eye, Sclera, Choroid retina. The eye as a camera, Sense of Hearing tympanic membrane and external ear, middle ear and vesicles internal ear and its functions.

Conduction of sound to the cochlea

The functions of Tongue and salivary glands

The Functions of Nose and Tonsils/Adenoids

The Functions of Skin and its appendages

Nervous System

General design of nervous system types and parts of nervous system Functions of brain, cerebrum spinal cord. Cranial nerves. Autonomic nervous system (Parts and Functions).

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PAPER :- RADIOGRAPHIC TECHNIQUES - I

ELECTRO –MAGNETISM

1. Introduction to the course.
2. The structure of the atom.
3. Isotopes.
4. Ionization and excitation.
5. Electric Charges.
6. Electric introduction-electroscopes.
7. Electric charge an electrical potential.
8. Capacitance and capacitors.
9. Electric current- ampere, volt, resistance.
10. Resistance and ohms law.
11. Circuit laws.
12. Energy and power.
13. The heating effect of electric current.
14. Sources of electrical energy.
15. Magnetism-introduction.
16. The magnetic effect of electric current.
17. Applications of magnetic effect.
18. Electro-magnetic induction.
19. Mutual induction and self-induction.
20. Introduction of A.C.
21. Transformer-theory
22. Transformer-practical aspects.
23. Introduction A.C circuits.
24. Reactance, resonance, impedance.
25. Power factor-power in single-phase circuit.
26. Single phase three phase, comparison and contrast.
27. Electrical distribution system in Pakistan.
28. Different supply systems.
29. A.C in three-phase system.
30. Introduction to electrical machines.
31. Generator-A.C. & D.C. Principle, working-main parts.
32. Motor-Principle, Main parts working.
33. Electrical measuring instruments and measurements.
34. Indicating instruments-types, Principle and working.

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35. Thermionic emission and P.N. JUNCTION.
36. Diode structures and working.
37. Characteristics of diodes.
38. Triode-its working and characteristics.
39. Rectification.
40. Introduction to amplification.

RADIATION PHYSICS

1. Structure of atom, definitions of terms.
2. Electromagnetic Radiation theory and properties.
3. Wave theory and Quantum theory of Radiation.
4. Visible light and fluorescence.
5. The properties of X-Rays.
6. The Production of X-Rays and interaction with targets.
7. Spectra of X-Rays.
8. The factors affecting quantity and intensity.
9. The thermionic emission of cathode.
10. Principle of X-Rays tubes.
11. Triode valve and semiconductors.
12. Cathode ray and oscilloscopes.
13. Introduction to higher voltage rectifier circuits.
14. Practical aspects of X-Rays.
15. Self-Rectifying circuits.
16. Half Wave and Full wave pulsating voltage circuits.
17. Constant potential circuits.
18. The measurement of higher voltage.
19. Introduction to X-Ray control, X-Ray tube voltage (kV.), X-Ray tube current (M.A).
20. Exposure controls.
21. Interaction of x and gamma rays with matter.
22. The transmission of a homogeneous beam through a medium.
23. Absorption and scattering process.
24. The transmission of a heterogeneous beam through a medium and filtration.
25. The transmission of a beam through body tissue.
26. Shapes and fine details in the X-Ray image.
27. Basis of X-Rays measurement exposure, half value longer, Dose equivalent and other methods.
28. Introduction to radioactivity-Discovery, emission, transformation process and branching.

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29. Radioactive decay, artificial or induced radioactivity, exposure rate constant and used of radionuclide's in medicine.
30. Introduction to Radiation protection, maximum permissible dose, protective materials and radiation.
31. Introduce to nuclear medicine-properties of nuclides, organ specific up take, detection of radiation radio nuclide imaging.
32. Physics do ultrasound-nature, generation, power and intensity.
33. Transmission of ultrasound through matters, ultrasonic scans safety.
34. Physical basis of tomography-introduction.
35. Introduction to computer and Computed tomography.
36. Physics of magnetic Resonance imaging.
37. Introduction to laser and safety precaution concept of radiotherapy.

FILMS AND DARK ROOM TECHNIQUES.

PHYSICAL BASIS OF RADIOGRAPHY.

1. Image formation, distortion and blurring.
2. Composition and constituents of X-Ray films.
3. Effects of X-Rays on X-ray film-sensitivity.
4. Methods of storage of films.
5. Introduction to florescence Fluorescent materials.
6. Purpose and methods of using florescence screen intensifying screens.
7. Physical construction of screens, cassettes and holders.
8. Intensification factors.
9. Screens for multi section tomography.
10. Care and Safety of screens and x-rays cassettes.
11. Variation of films and screens with patient's thickness and an anatomical structure.
12. Focal film distance, speed of films, speed of screens.
13. Methods of film labeling and identification, sizes etc.
14. Chemicals used in film development.
15. Film development with manual and automatic techniques.
16. Defects in films.
17. Introduction to automatic developers, materials used.
18. Introduction to different type's contrast media official and trade names.
19. Contrast media dosage-methods and procedures.
20. Side effects of contrast media, official and trade names.
21. Treatment of reactions from contrast media.
22. Types of films used in ultrasound methods of storing.
23. Use of computers in recording and storage of images.

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24. Store keeping in radiology.

25. Inventory and ordering and reordering in radiology.

F.SC IMAGING 2ND YEAR

S.No	Subject/Papers	Course	Marks	
1.	English – II	According to BISE Peshawar	Theory 100	Practical Nil
2.	Urdu – II	According to BISE Peshawar	100	Nil
3.	Pak Study	According to BISE Peshawar	50	Nil
4.	Applied Sciences Computer & Patient Safety	Teacher Lecture Notes	75	25
5.	Basic Medical Sciences Public Health & First Aid	Teacher Lecture Notes	50	25
6.	Radiology Techniques –II	Teacher Lecture Notes	75	50

Grand Total= 450 + 100 = 550

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PAPER :- SUBJECTS PUBLIC HEALTH

1. Introduction: To health field, definition of health, preventive, social, community and family medicine.
2. Health care organization in Pakistan.
 - i. General introduction to federal, provincial, divisional and district level organizational structure.
 - ii. Role of Paramedics in hospitals

AIR

Composition and functions-Pollution and pollution indicators-impurities in air cleaning methods (an over view)

WATER

Sources of water with special reference to Pakistan. Impurities-Safety Purification, Natural and artificial methods.

VENTILATION

Objectives and merits. Over crowding and its effects on human body. Natural ventilation and artificial ventilation.

WASTAGE

Introduction-refuse and its collection. Methods of collection and disposal of refuse-Excreta-Methods of collection and disposal of Excreta.

INFECTION AND DISINFECTING

Introduction-Terminology-Methods of disaffection
Sources of infection-routes of transmission i.e., air water and food

COMMUNICABLE DISEASES

Introduction-EPI and diseases related to it, vaccination schedule.
Communicable diseases like T.B, diphtheria, tetanus, polio, whooping cough and measles
Epidemiology and prevention methods for above diseases.

FAMILY PLANNING

Need and objectives-general methods.

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PAPER:- BASIC MEDICAL SCIENCES (PUBLIC HEALTH & FIRST AID)

First Aid

Definition

Principles

Actions at emergency

1. Dressing + Bandages
2. Short structure & function of respiratory system
3. Asphyxia
4. Assisted respiration
5. Short structure and function of C.V.S
6. Shock (Circulatory failure) Patho-Physiology
7. Cardiogenic shock Treatment
8. Hypo-volume shock (Hematologic) with treatment other condition
9. Anaphylactic Shock Signs, Symptoms, Treatment
10. Septic Shock
11. Neurogenic shock
12. Cardiopulmonary resuscitation principles practical demonstration
13. Assessment of newborn
14. Resuscitation of new born
15. Short structure & function of locomotive, sprains and strains
16. Fractures, First Aid Management
17. Burns, Scalds causes and First Aid Management
18. Wounds cuts stabs and management
19. Management of Bleeding from wound/Nose/Mouth/Misc
20. Drowning – first aid management
21. Road traffic accidents (First Aid Management
22. Transport of injured persons especially spinal are
23. Care of Coma/Stupor unconscious victim
24. Poisonings-swallowed persons and first aid management
25. Poisonings inhalation poisonings first aid management
26. Bites Stings management human, cat dog insect
27. Snake bite and first aid management
28. Phylatic Shock and its management
29. Choking (Foreign body in airway)
30. Abdominal pain (First Aid)
31. Sport injuries
32. Safety at home precautions/safety
33. Precautions at kitchen to avoid accidents
34. Precautions at bathroom
35. Precautions in living room
36. Precautions at stairs and at terraces

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PAPER:- APPLIED SCIENCES (COMPUTER SCIENCES & PATIENT SAFETY)

Computer Sciences

Note: This is an introduction to Computer Science. A brief description and definitions of terms will be taught to the students.

1. An over view of Computer System
2. The shapes of computer today-Super Computer, Main frame, mini computer, works stations and PC
3. Input methods-Key board, Mouse
4. Alter native methods of input - hand devices, optical devices, Audio-visual input devices
5. Monitors and sound system –Monitors- PC. Projectors, sound system
6. Printer and brief introduction to its types
7. Transforming data into information representation, process, speed etc
8. CPU-types with definition
9. Types of storage devices – Magnetic and optical
10. Measuring drive information – access time, file compression, transfer rate, interface standard
11. Basic of operating system – interface, program, files hardware and software management
12. Definitions of Unix, DOS, Macintosh operating system, windows, OS / 2, windows NT, 95, 98, 2000, Linux
13. Words processing and Desk tope Publishing software
14. Spread sheet software
15. Presentation program
16. Presentation program
17. Data base management system
18. Networking basics – brief of use, structure, LANs, Media, Hardware and software
19. Internet basics
20. Accessing, connecting, working on internet, introduction to DICOM, PACS
21. Working with images
22. Graphics Software
23. Understanding multi-media
24. Creating and distributing media contents
25. Basics of information system- five phases-need, Design, development implementation, maintenance
26. Building information system – five phases – need Design, development, implementation, maintenance.
27. Creating programs-definitions of program and approaches
28. Programming language and system development life cycle
29. Ergonomics health and privacy issues
30. Brief of computer crimes, Viruses. Theft and computer environment

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PAPER:- APPLIED SCIENCES (COMPUTER SCIENCES & PATIENT SAFETY)

Patient Safety

ELECTRICAL HAZARDS

- Electrical current and body muscles
- Electric shock
- Defibrillators
- Pace makers
- High and low frequency electricity in medicine
- Classification of medical equipment
- Degree of protection in equipment
- Earth leakage current
- Maximum current limits and safety tests

FIRE AND EXPLOSION IN HOSPITALS

- Inflammable gases and liquids
- Static electricity
- Precaution against fire and explosion

SURGICAL DIATHERMY AND OTHER POSSIBLE HAZARDS IN HOSPITALS

- Surgical diathermy and precautions
- Mechanical hazards
- Heat and light hazards
- Chemical burns

RADIATION

- Non-ionizing radiation
- Ionizing radiation
- Microwave ovens
- Ultrasound therapy equipment
- Lasers

INFECTION IN HOSPITALS

- The hospital environment
- Pathogenic, non-pathogenic microorganisms
- Modes of spread of infection
- Kinds of infection
- Cross-infection
- Precautions and prevention

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PAPER :- RADIOGRAPHIC TECHNIQUES - II

POSTIONING AND PROCEDURES

1. Introduction to the subject.
 - a. Positions and procedures of X-ray for all bones of upper limbs, quantity of Kv. Milliamp, seconds etc.
 - b. Bones of vertebral column, their positions including focusing, position of patient, kV. milliamp and seconds required, distance from the tube etc.
 - c. Bones of lower limbs including pelvis, their positions and kV, milliamp second required.
 - d. Bones of thorax-positions and procedures for X-ray.
 - e. Bones of neck and their positions.
 - f. Digestive system positions and procedures.
 - g. Urinary system position, procedure dyes and other medicines used to take x-rays dose required.
 - h. Human reproductive system positions and procedures k.V. milliamp and second required.
 - i. Skull-face, salivary glands, paranasal sinuses, their positions, procedure adopted.
 - j. Ear, Mastoid, and Temporal Bones-position procedures.
 - k. Respiratory system and heart.
 - l. Pediatric Radiography
 - m. Pluro scopy-positions and procedures-comparison and contrast with conventional radiography.
 - n. Mammography.
 - o. Myelography.
 - p. Introduction to ultrasound, Sonographic techniques, preparation and reassurance of patient.
 - q. Conventional Tomography-Its principals & techniques.
 - r. Introduction to C.T Scan.
 - s. Isotope scammimg-theory and practice.
 - t. Magnetic Resonance imaging (MRI) Introduction, CT scans, VIS-À-VIS Brain/Spinal Cord.
 - u. Angiography-Diagnostic and Interventional.
 - v. Emergency Radiography.
 - w. Radiography for Foreign bodies.
 - x. Theater Radiography.
 - y. Ward Radiography.

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z. Introduction to Lithotripsy.

X-RAY EQUIPMENT

1. COMPONENTS AND AONTROLS OF X-RAY CIRCUITS:-

High tension transformer-Rectification of high tension (Half and full wave)-kV control and indicators-Filament and control of tube current-Millamperes Indication-Mains voltage compensation-Main supply and the X-Ray set.

2. HIGH TENSION GENERATORS:-

-Rating of X-Ray generators-self-rectified high tension Full-wave rectified circuit-circuit comparisons. Three phase's full-wave rectified circuit-voltage waveforms are HT. generator-constant potential circuit-Failing load generators-shared generator.

3. FUSES, SWITCHES AND INTER LOCKS:-

-Fuses, Switches, Circuit Breaker-interlocking circuits.

4. EXPOSURE SWITCHES AND EXPOSURE TIMERS:-

-Switches system-Timing systems-Exposure switches and its radiographic applications.

5. LOGICS:-

Binary counting system-Logic elements-applications of logic circuits-Radiographic timing and

Switching circuit.

6. X-RAY TUBES:-

Construction of X-Ray Tubes-Fixed anode X-Ray tube-rotating anode-X-Ray tube-rating of X-Ray.

Tube-Faults in X-Ray tube-characteristics of X-Ray tubes-metal X-Ray tube-X-Ray tubes For mammography-choice of an X-Ray tube. Tube Stands and tube support.

Filter-types and uses.

Choices of kV and contrast.

Tube diaphragms.

Collimation-Nature, types, methods and equipment.

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7. CONTROL OF SCATTERED RADIATION:-

-Significance of scatter-Beam limiting devices-Beam centering devices-the secondary radiation grid-Grid movements-assessment of grid functions. Grids-construction and operation.

8. PORTABLE AND MOBILE X-RAY EQUIPMENT:-

Main requirement-portable X-Ray equipment-Mobile X-Ray equipment-capacitor discharge mobile equipment-Cordless mobile equipment-operating theater X-Ray Equip.

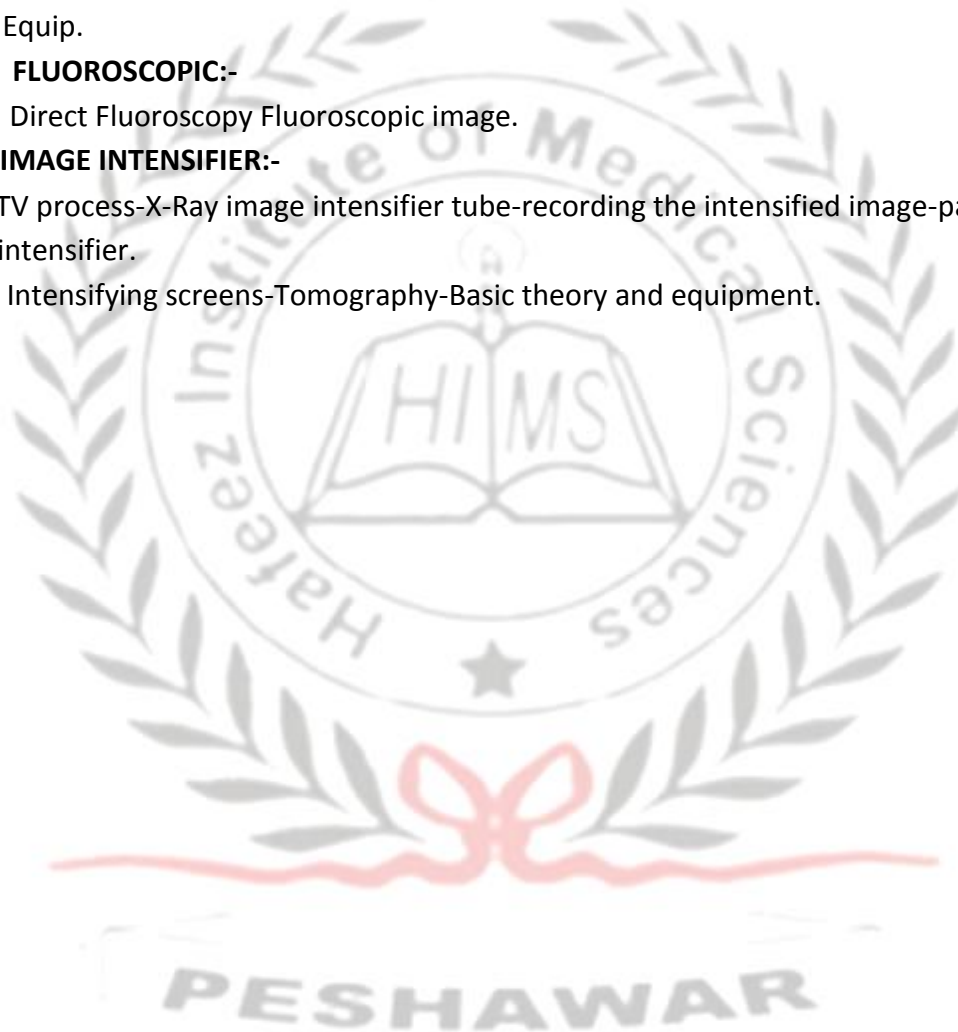
9. FLUOROSCOPIC:-

Direct Fluoroscopy Fluoroscopic image.

10. IMAGE INTENSIFIER:-

TV process-X-Ray image intensifier tube-recording the intensified image-panel-type intensifier.

11. Intensifying screens-Tomography-Basic theory and equipment.



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RADIOLOGICAL ANATOMY

1. Surface Anatomy.
2. Anatomy of upper Limbs.
3. Anatomy of lower Limbs including pelvis.
4. Anatomy of vertebral column.
5. Anatomy of Thorax.
6. Anatomy of Neck.
7. Anatomy of Neck.
8. Anatomy of digestive system.
9. Anatomy of urinary system.
10. Anatomy of male and female reproductive system.
11. Anatomy of skull, face, salivary glands & paranasal sinuses.
12. Anatomy of ear, Mastoid & temporal bone.

PRACTICAL ACTIVITIES RADIOLOGY

RADIOLOGY

1. Introduction, general requirements for radiology.
2. Characteristics of a radiograph regarding its size shape position, density.
3. Demonstration of radiographic positioning/movements' relationship and anatomic terms.
4. Demonstration of different parts of X-Ray machines & how to clean them.
5. Demonstration of care of cassettes.
6. Demonstration for the uses of aseptic techniques while handling with the patients.
7. Demonstration for the development of exposed films in the dark room.
8. Demonstration of general body planes/positions/body cavities/division of abdomen.
9. Body demonstration of arterial terms.
10. Radiographic positioning terminology projection terminology/ body movements.

UPPER EXTREMITY

11. Demonstration of different positioning of upper extremity e.g. of hand, wrist, fingers, carpal bones, femur, elbow humors.
12. Practical on shoulder projections e.g. axial projection AP, oblique, tangential Clavicle PA & PA axial views.

LOWER EXTREMITY

13. Demonstration of different positing of lower extremity e.g. foot, leg, thighs, Foot AP Lateral, medial projections etc.

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14. Ankle projections e.g. AP lateral oblique.
15. Leg projection e.g. AP lateral oblique.
16. Knee projection AP, PA lateral oblique.
17. Femur projection AP, Lateral.
18. Pelvis & upper femur projection AP lateral.
19. Pelvis & hip joints axial projections, AP lateral.
PA, oblique views.
20. Projection for vertebral column e.g. occipital cervical antecubital (Open mouth) AP
projection cranial, thorax, lumbar & sacral vertebrae.

CHEST

21. Demonstration for positioning of trachea, lung & heart e.g. AP lateral oblique.

MOUTH & ABDOMEN

22. Radiographic positioning for parotid and sub maxillary glands.
23. Demonstrations for routine procedures & positions e.g. preparation of patients
exposure techniques radiographic projection & radiation projections.
24. Biliary tract
Cholangiography & Cholangiogram
Procedure/Patient preparation/ Preliminary diet/contraindications.
25. Demonstration for contrast studies of gastrointestinal tract e.g. barium meal & follow
through, barium enema preparation for examining room preparation of patients
radiation positioning, exposure term.

URINARY SYSTEM

26. Demonstration on urography cystography, contrast used preparation of patient
radiologic procedure & protection measure.

SKULL

27. Demonstration on lateral projection of cranium patient position/central hearing P.A
Projections, AP full basal etc Sella turcica projection.
28. Projection of nasal bones & Para nasal sinuses.

RADIATION PROTECTION

29. Demonstration of different methods & shields used for radiation protection.

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SPECIAL TECHNIQUES COMPOUND TOMOGRAPHY

30. Demonstration for different equipments for tomography machine its parts/positioning for tomography for different areas/immobilization techniques.
31. General rules for tomography and definition of terms.

MAMMOGRAPHY

32. Demonstration of different positions/projections/definition of different terms.

MYELOGRAPHY

33. Demonstration of different media/preparation of room and patients/positions & projection for this procedure.

MEGNETIC RESONANCE IMAGING

34. Demonstration on equipment for MRI/instrument parameters/position for different regions.

ULTRASONOGRAPHY



HAFEEZ INSTITUTE OF MEDICAL SCIENCES PESHAWAR

BOOKS RECOMMENDED

1. Physics for radiology students
By. Dr. M.B. Zafar
Publisher: - Zafars 273-A-1 Abid Majeed Road, Rawalpindi.
2. First year Physics for radiographer. By.E.Hughes
Publisher: - E &BS U.K.
3. X-Ray equipment for student radiographers. By.DN & MO Chesney.Publishers: Black scientific Publication Oxford London.
4. Medical X-Ray Tchniques in diagnostic radiology. By: Ploat Publishers: Macmillan Press London.
5. Merril's allas on radiographic position and radiological procedures Vol.: I, II & III. By. Phillip.W.Belliager Publisher: - C.V Mosby company st: Louis, Toronto & Preston.

