

HAFEEZ INSTITUTE OF MEDICAL SCIENCES PESHAWAR



Curriculum F.Sc Operation Theatre

Part – I & Part – II

HAFEEZ INSTITUTE OF MEDICAL SCIENCES PESHAWAR

F.Sc OPERATION THEATER (OT) 1st YEAR

| S.No | Subject/Papers | Recommended Books | Marks | |
|------|--|----------------------------|---------------|------------------|
| 1. | English – I | According to BISE Peshawar | Theory 100 | Practical Nil |
| 2. | Urdu – I | According to BISE Peshawar | 100 | Nil |
| 3. | Islamiat | 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. | Operation Theatre Techniques –I | Teacher Lecture Notes | 75 | 50 |

Grand Total= 450 + 100 = 550

PESHAWAR

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

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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
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

HAFEEZ INSTITUTE OF MEDICAL SCIENCES PESHAWAR

PAPERS: - BASIC MEDICAL SCIENCES (ANATOMY & PHYSIOLOGY)

Anatomy

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

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

The Nervous System

1. CNS central nervous system

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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 Endocrine 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

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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.

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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Papers:- Operation Theatre Techniques 1st Year

MICROBIOLOGY

1. Introduction to micro-organisms
2. Classification of bacteria
3. Structure and reproduction of bacteria
4. Characteristic of Rickettsiae
5. Transmission and diseases caused by Rickettsiae
6. Prevention and control of Rickettsiae
7. Characteristic of Chlamydia
8. Transmission and diseases caused by Chlamydia
9. Treatment, prevention and control
10. Characteristics of Spirochetes
11. Transmission, prevention and control
12. Diseases caused by Spirochetes
13. Composition and structure of Virus
14. Classification of Virus
15. Mode of Transmission and common diseases caused by Virus
16. Prevention and control
17. Characteristics of Protozoa
18. Biology and diseases caused by Protozoa
19. Prevention and control
20. Characteristics and reproduction of Fungi
21. Diseases caused by Fungi with reference to O.T
22. Control and Prevention
23. Sterilization and disinfection
24. Introduction to Chemotherapy
25. Characteristics and use of chemotherapeutic agents in O.T
26. Introduction to Immunity and Immunology
27. Acquired Immunity and resistance factors
28. Methods of environmental cleanliness in O.T
29. How to keep instruments, equipments and other things bacteria free

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STERILIZATION AND SUPPLIES

1. Introduction to sterilization
2. Sterilization and Disinfections
3. General Principles of sterilization
4. Types of Sterilizations
5. Methods of Heat Sterilization and equipment
6. Autoclave, main parts and working principle
7. Chemical Sterilization and the Chemical used in it
8. Sterilization by radiation
9. Detergents, types and uses
10. Gas Sterilization and its uses
11. Scrubbing and its methods
12. Draping and its methods
13. Lighting and ventilation requirements
14. Humidity and heating requirements
15. Blood Transfusion:- Blood storage, grouping, cross matching etc.
16. Infusion

O.T. EQUIPMENT

1. Introduction to electro-medical equipment used in O.T
2. O.T. lights uses, types lamps etc
3. Shadow less lighting – features, types
4. Direct, semi direct, indirect lighting
5. Grounding system – parts and structure
6. Monitoring equipment such as cardiac monitors
7. Defibrillators
8. Surgical diathermy – structure, block diagram, types
9. Safety Precautions
10. General equipment maintenance requirements
11. Anesthesia machine – parts, block diagram etc
12. Sterilizers, types and characteristics

HAFEEZ INSTITUTE OF MEDICAL SCIENCES PESHAWAR

F.Sc OPERATION THEATRE (OT) 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. | Basic Medical Sciences Public Health & First Aid | Teacher Lecture Notes | 75 | 25 |
| 5. | Applied Sciences Computer Skill & Patient Safety | Teacher Lecture Notes | 50 | 25 |
| 6. | Operation Theatre Techniques –II | Teacher Lecture Notes | 75 | 50 |

Grand Total= 450 + 100 = 550

HAFEEZ INSTITUTE OF MEDICAL SCIENCES PESHAWAR

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

Public Health

Introduction: To health field, definition of health, preventive, social, community and family medicine.

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

FIRST AID

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

HAFEEZ INSTITUTE OF MEDICAL SCIENCES PESHAWAR

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

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PAPERS:- 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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PAPERS:- OPERATION THEATRE TECHNIQUES 2ND YEAR

REGIONAL ANATOMY AND PHYSIOLOGY

Brief revision of the following topics the number shows number of periods in which each topic should be covered.

GENERAL SURVEY OF HUMAN SKELETON

- Skeletal Tissues
- Cartilages
- Tendon
- Ligaments
- Bone
- Joints

RESPIRATORY SYSTEM

- Upper and lower respiratory tract
- Lungs
- Pleura
- Diaphragm

CARDIOVASCULAR SYSTEM

- Arteries
- Veins
- Heart

EXCRETORY SYSTEM

- Kidneys
- Ureter
- Bladder
- Urethra

ENDOCRINE GLANDS

- Pituitary Gland
- Adrenal Gland
- Thyroid Gland
- Para thyroid Gland

NERVOUS SYSTEM

- Nervous Tissues
- Central Nervous System
- Peripheral System

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SURGICAL TECHNIQUES

1. Introduction to operating department
2. O.T. Table and position used for surgery
3. Operation Preparations
4. Classification of instruments and apparatus: Disposable/Non disposable, sharp instrument, sutures, needles, syringes and hypodermic needles, special instrument, catheters their working and care
5. Ligature and suture materials
Introduction, cat guts (Preparation, sizes, handling), absorbable and non absorbable ligatures and sutures, natural materials (silk worm gut, silk threads, linen cotton their sizes and classes) Nylon, polyesters, polyethylene, polypropylene, metallic wire, metal clips as sutures and as ligatures.
6. Storage and handlings of suture materials associated with instrument. Ligature requisites, scalpel blades, handles and needless scissors etc.
7. Draping, operation areas
8. Terminology and technical words used in theatre
9. Operating microscopes:
10. Fiber optic endoscopy: Introduction types, procedure and care of the instrument
11. Introduction to general instrument, scalpel, scissors, forceps, knives, hooks, retractors etc. The instruments types, sizes and materials
12. Abdominal surgery: Laparotomy set, types of incisions, gall bladder, hernia appendectomy etc
13. The patient, procedure, instruments used in each operation will be taught and operation on breast
14. ENT Operations: Definitions of operations, position of the patient, general instrument used in each operations
15. Neuro –surgical Operations: Positions of the patient, general instruments used in each operation
16. Ophthalmic Operations
17. Orthopedic Operations
18. Urological Operations
19. Thoracic Surgery
20. Gynecological Operations
21. Plaster of Paris Techniques
22. Radioactive material used in theatre: Care use, safety precautions and disposal

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ANESTHESIA AND PATIENT CARE

1. Physics and chemistry of anesthesia
2. Anesthetic agents, types and uses
3. Chemicals and gases
4. Physiology of Respiration
5. Stages of anesthesia
6. Patient preparation before and after anesthesia
7. Patient management during anesthesia
8. Anesthesia Machine
Pre and postoperative care of patients

RECOMMENDED BOOKS

Operative Techniques by Dr. S. Das, Japee

Surgery by Dr. Kumar (Japee)

Book of Surgical Instruments by D.

