

MEWAR UNIVERSITY

(A University u/s 2(f) & 12 (B) with right to confer degrees u/s 22(1) of the UGC Act 1956
and Established by Rajasthan State Govt. Act No. 4 of 2009)

(NAAC ACCREDITED)

MEMBER, ASSOCIATION OF INDIAN UNIVERSITIES (AIU)

SYLLABUS

B. Sc. OPERATION THEATRE TECHNOLOGY



University Campus: NH- 48, Gangrar, Chittorgarh, Rajasthan – 312901
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Bachelor of Operation Theatre Technology
Examination Scheme
B.O.T.T First Years (3+1) Years Course

FIRST YEAR

S.NO.	SUBJECT	DISTRIBUTION OF MARKS				
		THEORY	INTERNAL	PRACTICAL		TOTAL
				TH	INT	
1	Anatomy & Physiology	80	20	40	10	150
2	Biochemistry	80	20	40	10	150
3	Pathology & Microbiology	80	20	40	10	150
4	General Principles Of Hospital Practice And Patient Care	80	20	40	10	150
5	Computer Science	80	20	40	10	150
TOTAL		400	100	200	50	750

SECOND YEAR

S.N O.	SUBJECT	DISTRIBUTION OF MARKS				
		THEORY	INTERNAL	PRACTICAL		TOTAL
				TH	INT	
1	Introduction To Anesthesia Technology	80	20	40	10	150
2	Basic Anesthesia Technology	80	20	40	10	150
3	Applied Anesthesia Technology	80	20	40	10	150
4	Basic Intensive Care Unit	80	20	40	10	150
5	Biomedical Waste Management	80	20	40	10	150
TOTAL		400	100	200	50	750

THIRD YEAR

S.N O.	SUBJECT	DISTRIBUTION OF MARKS				
		THEORY	INTERNAL	PRACTICAL		TOTAL
				TH	INT	
1	Clinical Operation Theatre Technology	80	20	40	10	150
2	Applied Operation Theatre Technology	80	20	40	10	150
3	Advance Operation Theatre Technology	80	20	40	10	150
4	Basic OT Equipments Technology	80	20	40	10	150
5	Bio Statics & Lab Management	80	20	40	10	150
TOTAL		400	100	200	50	750

Bachelor of Operation Theatre Technology

(First Year)

PAPER-1 A (ANATOMY), B (PHYSIOLOGY)

Syllabus:

I. The human body as a whole Definitions, Subdivisions of Anatomy, Terms of locations and position, Fundamental Planes, Vertebrate structure of man, organization of the Body Cells and Tissues.

II. Locomotion and support. The Skeletal system.

III. Anatomy of the nervous system.

- **Central nervous system.**
- **The Brain.**
- **Peripheral nervous system (structure of neuron).**

IV. Anatomy of circulatory system.

- **Heart.**

V. Lymphatic system.

VI. Anatomy of the respiratory system.

VII. Anatomy of the digestive system.

VIII. Anatomy of excretory system and reproductive system.

IX. Male Reproductive System Female Reproductive System.

X. Anatomy of the endocrine system.

Anatomy Practical:

- Demonstration of bones.
 - Demonstration of heart.
 - Demonstration of different parts of respiratory system.
 - Demonstration of the part of digestive system.
 - Surface anatomy on cadaver.
 - Demonstration of major vessels of the body.
 - Demonstration of other organs—spleen, testis, uterus.
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(B) PHYSIOLOGY

- i. **General Physiology:** Cell: Structure and function of a cell, Tissues.
- ii. **Blood:** Composition and functions of blood & Blood Cells.
- iii. **Gastrointestinal Tract.**
- iv. **Respiratory System.**
- v. **Cardiovascular System.**
- vi. **Excretory System.**
- vii. **Endocrine System.**
- viii. **Reproductive System.**
- ix. **Central Nervous System.**
- x. **Special Senses.**
- xi. **Skin and Temperature.**

Practical:

- Collection of blood
- Study of haemocytometer. Haemoglobinometry white blood cell count, red blood cell count,
- Determination of blood groups.
- Calculation of blood indices, fragility test for R.B.C.
- Erythrocyte sedimentation rate (ESR)
- Determination of bleeding time.
- Determination of clotting time
- Blood pressure recording auscultation for heart sounds, artificial respiration determination of vital capacity.

Recommended Books:

1. Text books of Physiology. Author: Guyton (Arthur C). Prism publishers Bangalore.
 2. Human Physiology. Author : Chatterjee (cc). Medical allied agency
 - 2.1.1. Concise Medical physiology. Author : Choudhary (Sujit km.). New central books Kolkata.
 3. Review Medical physiology. Author : Ganang. Application and Lange.
 4. Human physiology. Author : Pro. A.K. Jain. Avichal Publishing Company.
 5. Practical Physiology : Author : Prof. A.K. Jain, Arya Publishers.
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Paper 2-Biochemistry

- 1) Acids and Bases. Definition. definition of pH and its interpretation.
- 2) Water and Solutions. Osmosis, Molarity, Molality, Normality. Buffer solution and their importance. pKa of buffer solution.
- 3) Chemistry of Carbohydrates: Definition, Classification, Structural Isomerism, Optical isomerism. reactions.
- 4) Chemistry of Proteins and Amino Acids: Definition, Structure and classification of Amino Acids. Essential amino acids.
Definition, Structure of proteins, Functional classification of proteins.
- 5) Chemistry of Lipids: Definition of lipids, Classification of lipids, Phospholipids, Gangliosides, Cerebrosides, Glycolipids, Lipoproteins (definition, classification and functions) Chemical reactions of Lipids.
- 6) Chemistry of Nucleic acids: Structure of DNA, RNA classification and structure of the various types of RNA.
- 7) Nutrition and Basal metabolism: BMI and its calculation, Specific dynamic action (SDA) , Nutritional requirements and their calculations. Protein energy malnutrition.
- 8) Vitamins: definition, Classification, Uses in the body and deficiency diseases.

Practical:

- Introduction to apparatus, instruments and uses of chemical balance.
 - Preparation of solutions, calculation of molecular weights and Equivalent weights preparation of normal solution, molar solutions, percent solution and reagents Dilution techniques.
 - Identification of carbohydrates, proteins and substances of biochemical Importance.
 - Demonstration of colorimeter, spectrophotometer, perimeter, single pan balance.
 - Disposal regulations, workplace hazardous.
 - Specimen collection, identification, transport, delivery and preservation.
 - Patient preparation for tests.
 - Anticoagulants and preservatives
 - pH determination
-

Paper 3- Pathology + Microbiology

(A) Pathology

➤ **UNIT 1 -The Cell in health and disease**

- Introduction of pathology
- Cellular structure and metabolism
- Inflammation – Acute and Chronic
- Derangement of Body Fluids and Electrolytes

➤ **UNIT 2 Body Fluid**

- Urine Examination
- Stool Examination
- C.S.F. Examination
- Semen Analysis
- Human blood group antigens and antibodies
- ABO Blood group systems
- Rh Blood group System
- Blood Collection

➤ **UNIT 3 HISTOPATHOLOGY**

- a) Fixation of tissues
 - b) Tissue Processing
 - c) Section Cutting
 - d) Decalcification
- Staining Dyes and their properties, H & E Stain, Special Stains Histo Pathology ,Clinical Pathology, Haematology and Blood Banking
HistoPathology - Theory
 - Introduction to Histo Pathology
Receiving of Specimen in the laboratory
Grossing Techniques
 - Mounting Techniques – various Mountants
Maintenance of records and filing of the slides.
Use & care of Microscope
 - Various Fixatives, Mode of action, Preparation and Indication.
Bio-Medical waste management
 - Section Cutting
 - Tissue processing for routine paraffin sections
Decalcification of Tissues.
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- Staining of tissues - H& E Staining
Bio-Medical waste management
- Clinical Pathology – Theory
Introduction to Clinical Pathology
- Collection, Transport, Preservation, and Processing of various clinical specimens
- Urine Examination – Collection and Preservation of urine.
- Physical, chemical, Microscopic Examination
- Examination of body fluids.
- Examination of cerebro spinal fluid (CSF)
- Sputum Examination.
- Collection of Blood samples
- Various Anticoagulants used in Haematology
- Various instruments and glassware used in Haematology, Preparation and use of glassware
- Laboratory safety guidelines
- Hb,PCV
- ESR
- Normal Haemostasis
- Bleeding Time, Clotting Time, Prothrombin Time
- Blood Bank
- Blood grouping and Rh Types
Cross matching

Practical:

Introduction: Aim, basis, interpretation, safety in clinical pathology laboratory.

Laboratory organisation : Instruments, glassware's, sample collection and specimen labeling, routine test, anticoagulants, reagents, cleaning of glassware, isotonic solution, standardization of methods, preparation of solution and interpretation of result, normal values.

1. Basic requirements for hematology laboratory.
2. Complete Blood Counts.
3. Determination of Hemoglobin.
4. Determination of Platelet count.
5. Determination of PCV by Wintrob's.
6. Erythrocyte Indices – MCV, MCH, MCHC.
7. BT and CT, PT (prothrombin) time.
8. ABO Blood grouping, RH typing and cross match.
9. Blood collection and preservation

PRACTICAL BLOOD BANK

1. **Blood Bank Administration**
2. **Cross Matching**
3. **Comb's Test**
4. **Compatibility testing for blood transfusion cross matching test.**

(B)Microbiology

Theory

Unit I

General microbiology

- Introduction & history of microbiology
- Morphology and physiology of bacteria
- Sterilization and disinfection

Unit II

Immunology

- Antigen and antibodies
- Antigen – antibody reactions
- Structure and functions of immune system
- Immune response
- Hypersensitivity

Unit III

Systemic bacteriology

- Staphylococcus
- Streptococcus
- Pneumococcus
- Corynebacterium

Unit IV

Virology

- Morphology and Replication of viruses
- Physiochemical characteristics of the viruses
- Classification of virus
- Laboratory diagnosis of viral infection

Unit V

Mycology

- Morphology and structure of fungi
- Classification of fungi and Cultivation of fungi
- Laboratory diagnosis of fungal infection

Fungal infections

Unit VI

Parasitology

- Introduction to parasitology with their classification

Protozoa

- Entamoeba histolytica
- Giardia lamblia
- Leishmania donovani (kala azar)

Helminthes

Cestodes

- Tenia solium & Tenia saginata
- Echinococcus granulosus

Nematodes

- Ascaris lumbricoides
- Ancylostoma duodenale
- Wucheria bancrofti
- Enterobius vermicularis & Trichuris trichuria

Practical

Bacteriology

- Universal precautions
- Collection and transport of clinical specimen
- Compound microscope (care and operation)
- Demonstration of sterilization of equipments- Hot air oven, bacterial filters
- Preparation of bacterial smear and staining- Gram's, Acid- fast, Staining of bacterial spores, flagella capsule, Albert stain, spirochaetes

Parasitology

Practical parasitology

- Examination of stool for parasites
 - Examination of blood & bone marrow for parasites
- Serological diagnostic methods, Skin test.

Immunology practical

- Collection of blood by venepuncture, separation of serum
- a) WIDAL, VDRL, CRP
 - b) Pregnancy test
 - c) ELISA
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Paper- 4 General Principal of Hospital Practice and Patient Care

- **First aid :** wounds, dressing, bandages and splints supports
 - **Infection:** Bacteria or cross infection the inflammatory process local tissue reaction
 - Principles of asepsis Sterilization methods of sterilization use of central sterile supply department
 - **Drugs in the department:** Storage classification labeling and checking regulations regarding dangerous and other drugs units of measurement special drugs ant depressive antihypertensive etc.
 - **OT Instrument & Technique (Theory + Practical)**
 - Identification & Demonstration of working of the equipment
 - 1 Boyle's Machine & it's functioning
 - 2 Boyle's vaporizer
 - 3 Magill's breathing circuit, Bains breathing circuit, pediatrics OTTcircuit
 - 4 Gas cylinders and flow meters
 - 5 Carbon dioxide absorption contester
 - 6 Suction apparatus-foot operated, electrically operated
 - 7 Ambubag laryngoscope hndotracheatubes
 - 8 Catheters,face masks, venti mask
 - Cheatles forceps,rampely,s sponge holding forceps mayo's towel chip,esmach's bandage,Simple tourniquet, pneumatic tourniquet
 - **INCISION MAKING METHOD AND INSTRUMENTS :** Bard parker knife handle, majorabdominal
 - incision, artery forceps and their types instruments used in homeostasis, Kocher's forceps,electric cautery.
 - **RETRACTORS:** Single hook retractors , Czerny's retractor, s, nerve hookretractors, Morris retractors, deaver's, retractors.
 - **WOUND MANAGEMENT** Seissors and its types sucking material and techniques,disinfectantsand
 - irritants, dressing procedures ,different types of bandages, surgical needle & needle holders,various types of suture material
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PAPER 5–COMPUTER SCIENCE

1. Computer Application.

- a. Input, output, storage unites.
- b. CPU, Computer system.

2. Computers Organization.

- a. Central Processing Unit.
- b. Control Unit.
- c. Arithmetic Unit.
- d. Instruction Set.

2.2 Memory

- a. Main Memory.
- b. Storage Evaluation Criteria.
- c. Memory Capacity.
- d. Random Access Memories.

2.3 Input Devices

2.4 Output Devices

3. Operating System

- a. Microsoft.
 - i. An overview of different version of windows.
 - ii. Basic windows elements.
 - iii. File management through windows.
 - iv. Using essential accessories : System took Disk cleanup. Disk defragmenter, Entertainment, Games, Calculator. Imaging - Fax, Notepad, paint, WordPad. Recycle Bin, Windows Explorer, Creating Folders, Icons

4 Word Processing:–

- a. Word processing concepts.
- b. Saving, closing, opening an existing document.
- c. Selecting text, editing text.
- d. Finding and replacing text.

5. Presentation Package:

- a. Creating opening and saving presentations.
 - b. Creating the look of your presentation.
 - c. Working in different views, working with slides.
 - d. Adding and formatting text, formatting paragraphs.
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6. Use at Internet and E-mail :

1. Internet.
2. Websites (Internet sites).
3. The Mail Protocol site.

7. Hospital Management System :

PRACTICAL

- Input Devices
- Output Devices
- Operating System
- Presentation Package:
- Use at Internet and E-mail :
- Hospital Management System :

REFERENCE BOOKS :

1. Foundations of computing first edition, 2002. *Author* : P.K. Sinha and P. Sinha.
 2. Microsoft office 2000 for windows, second Indian pint, person education. *Author* : S. Sagman.
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Second Year
Examination Scheme for B.O.T.T Second years (3 years course)

S.N O.	SUBJECT	DISTRIBUTION OF MARKS				
		THEORY	INTERNAL	PRACTICAL		TOTAL
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Paper 1: Introduction to OT Technology

1. Gas physics
2. Medical Gas Supply
3. Gas Administration Devices
4. Oxygen Therapy
5. Breathing System
6. Gas Analyzers Pulse Oximeter CO2 Monitor
7. Manual Resuscitators
8. Artificial air ways (oral and Nasal endotracheal tubes, tracheostomy tubes)
9. Methods of cleaning and sterilization of anesthetic equipments.
10. History of Anesthesia
11. Minimum Standards for anaesthesia

➤ **PRACTICAL**

- Flow meters
 - Vaporizers – Types, hazards, maintenance, filling and draining.
 - Mapleson system
 - Non breathing valves – Ambu valves
 - Pulse oximeters
 - Capnographs
 - Parts of airway and features
 - Face masks – Types, sizes and its usage.
 - Regional anesthetic era
 - Monitor pulse and BP
-

Paper- 2: Basic Anesthesia Technology

The introduction of this subject of Basics of Anesthetic Equipment & Drugs is essential for the operation theatre technician as the technician must be aware of such anesthetic equipment as well as the drugs prescribed by the concerned Physician and/or Surgeon for the patient immediately or after operation.

Unit

1. Boyle's Machine & Its functioning
2. Boyle's Vaporizer
3. Magill's breathing circuit Bains breathing circuit pediatric anesthesia circuit
4. Gas cylinder and flow meters
5. Carbon dioxide absorption contestor
6. Suction apparatus-foot operated electrically operated
7. Ambu bag laryngoscope hand tracheal tubes
8. Catheters face masks venti mask drugs
9. General Principles: Pharmacological classification of drugs Route of drug administration precautions in administration principles of drug toxicity prevention and treatment of poisoning adverse drug reaction
10. Sedatives & Hypnotics: Barbiturates morphine and others
11. Important groups of drugs, NS and other IV fluids ibuprofen, aspirin, antimicrobial agents ant allergic drugs ant diuretics
12. Pre-anesthetic medication
13. Local Anesthetic agents
14. Spinal Anesthetic agents
15. General Anesthetic agents

Practical

- Biomedical wastes
 - Electricity and electro medical equipments
 - Physics in principles of anesthesia machine
 - Boyle's machine in details
 - Pipeline system
 - Anesthesia gases
 - Vaporizers
 - Anesthesia gases
 - Different types of endotracheal tubes
 - Breathing circuits
 - General anesthesia
-

Paper- 3: APPLIED ANAESTHESIA TECHNOLOGY

1. Airway management
2. Anesthesia Machine & anesthesia delivery
3. Pre-operative room arrangements
4. Anesthetic drugs
5. Monitoring
6. Anesthesia subspecialty
7. Non-Operating Room Anesthesia Locations
8. Anesthesia care in Extreme Environments
9. Anesthesia for chronic pain management
10. OTT for trauma and other emergencies
11. Patient positioning and anesthesia
12. Recent advances in equipment and anesthesia
13. Medical Ethics in anesthesia
14. Environmental hazards and safety in operating room
15. Operating room management

PRACTICAL:

1. Arrangement of anesthesia trolley for general anesthesia
 2. Arrangement of anesthesia for regional anesthesia example: epidural, brachial etc.
 3. Arrangement of monitors and anesthesia machine before starting of any cases for anesthesia.
 4. Sterilization of anesthesia machine
 5. Arrangement of anesthesia breathing circuits ex: Magill's, Ayer's circuits etc.
 6. Filling of soda lime canistor of close circuits
 7. Arrangement of Simple oxygen administration devices during postoperative ward
 8. Airway gadgets arrangements during anesthesia procedures like Oropharyngeal airways, nasopharyngeal airways, endotracheal tubes and Laryngeal mask airways etc.
 9. Anesthesia Vaporizers to be filled and make arrangements for inhalational anesthesia with use of Ether, Halothane and Enflorane etc.
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Paper 4: Basic Intensive Care unit

1. Tumors benign and malignant cyst ulcers sinuses fistula differential diagnosis of cyst and tumor
2. Fractures and Dislocation :Classification of fracture management fixation reduction immobilization principles of closed reduction artificial prosthesis
3. Comparative and Surgical Anatomy : Investigating of breast benign disease carcinoma of breasts treatment of carcinoma of breast mastectomy
4. Head Injury : Common manifestation management of patient surgical interventions
5. Cleft lip & palate acute appendicitis urethral strictures
6. Different Surgical Instrument : Instruments used in major surgical operation including Biliary Tract Surgery Anorectic Surgery Urological Surgery Orthopedic Surgery Instruments Obstetrics and Gynecological Surgery instruments Plastic Surgery Instruments
7. Storing Sterilization and disinfections in ICU.
8. Care washing sterilization and maintenance of Emergency Instruments.
9. Wound Management; Scissors and its types sucking material and techniques disinfectants and irritant dressing procedures different types of bandages surgical needle & needle holders various types of suture material

Practical

1. Identification & Demonstration of working of the equipment
 2. Fumigation
 3. Cleaning and disinfection of articles
 - Packing articles for sterilization
 - Sterilization of equipments
 4. Positing Of patient
 5. Advanced ICU bad.
 6. Assisting with Doctor
 7. Observing and monitoring the patient in recovery room
 8. Terminal disinfection
-

Paper -5: Bio Medical Waste Management

Water Pollution

Water Quality Standards for potable water

Air Pollution

Greenhouse effect

Global warming

Bio Medical Waste Management

Introduction to bio medical waste

Type of bio medical waste

Collection of bio medical waste

Land Pollution

Soil conservation

Land erosion

Afforestation

Ecology

Basics of species

Population dynamics

Energy flow

Ecosystems

Social Issues and the Environment

Sustainable development and Life Styles:

Urban problem related to energy

Resettlement and Rehabilitation of people

Energy flow

Consumerism and waste products

Water Harvesting and Rural Sanitation

Water harvesting techniques

Different schemes of Rural Water Supply in Rajasthan

Rural Sanitation

Septic Tank

Collection and disposal of wastes.

Bio-gas

Community Awareness and participation

PRACTICAL:

- Collection of bio medical waste
- Soil conservation
- Land erosion
- Energy flow
- Ecosystems
- Resettlement and Rehabilitation of people
- Energy flow
- Water Harvesting and Rural Sanitation
- Water harvesting techniques
- Septic Tank
- Collection and disposal of wastes.
- Bio-gas

Reference Book

1. Environmental science-Coming ham Saigo
2. Solid waste management-C.L. men tall

Environmental Technologies for Sustainable Development Dr. Upendra Panadel, DR M.P.Poonia

Third Year
B.Sc. Operation Theater Technology
Examination Scheme for B.O.T.T Third years (3 years course)

THIRD YEAR

S.N O.	SUBJECT	DISTRIBUTION OF MARKS				
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Paper-I – Clinical - Operation Theatre Technology

- Layout of Operation theatres
- Peripheral Support areas Operating Room
- Special procedure rooms
- Principles of aspects & sterile technologies Asepsis, surgical scrub, gowning & gloving
Decontamination & disinfections
- Sterilization Assembly & packing
- Surgical instrumentation
- Specialized surgical equipment Electrosurgery
- Microsurgery Ultrasonography
- Positioning prepping and draping the patient
 - General surgery
 - Breast procedures
 - Abdominal surgery
 - Liver Procedures
 - Splenic procedures
 - Pancreatic Procedures
 - Esophageal

Practical:-

Layout of Operation theatres

Operating Room

Principles of aspects & sterile technologies

Asepsis, surgical scrub, gowning & gloving

Decontamination & disinfections

Sterilization Assembly & packing

Thermal sterilization

Chemical sterilization

Radiation sterilization

Surgical instrumentation

Paper- 2– Applied- Operation Theatre Technology

- Preoperative preparation of the patient
 - Diagnostic procedures
 - Pathological examination
 - Radiological examination
 - Historical background
- Types of Anesthesia
- Choice of Anesthesia
- General Anesthesia
 - Indication of general anesthesia
 - Endotracheal intubation
 - Maintenance
 - Monitoring Emergency
- Balanced Anesthesia
- Core of Anaesthetized patient
- Local & regional anesthesia
- Spinal and epidural
- Complication of general anesthesia
 - Complication of local/regional

- OTT Machine & central gas supply
- Difficult intubation

Practical:-

- Diagnostic procedures
 - Pathological examination
 - Types of Anesthesia
 - Choice of Anesthesia
 - Endotracheal intubation
 - Monitoring Emergency
 - Complication of general anesthesia
 - Local & regional anesthesia
 - Difficult intubation
-

Paper- 3– Advanced- Operation Theatre Technology

- Operation Theatre Techniques for Specialty Surgery:-
- Preparation, nursing requirement, equipments including instruments, Sutures & etc
- OTT techniques, patient positioning & recovery
- Gynecological/obstetric surgery
- Urological surgery
- Orthopedic surgery
- Neurosurgery
- Ophthalmic surgery
- Plastic and reconstructive surgery
- Head and neck surgery
- Thoracic surgery
- Cardiac surgery Vascular surgery
- Organ procurement and transplantation
- Thyroid surgery

Practical:-

- Preparation, nursing requirement, equipments including instruments, Sutures & etc
 - OTT techniques, patient positioning & recovery
 - Gynecological/obstetric surgery
 - Urological surgery
 - Orthopedic surgery
 - Neurosurgery
 - Ophthalmic surgery
 - Plastic and reconstructive surgery
 - Head and neck surgery
 - Thoracic surgery
-

Paper- 4– Basic OT Equipments Technology

- OTT Machine (Basic Boyle Machine)
- Vaporizers
- Breathing circuits
- Medical Gas Supply System
- Suction
- Manual Resuscitator (AMBU)
 - Various types & sizes
 - Pre-use check
- Airway Equipment
 - Various laryngoscopes- Types & sizes e.g. Macintosh, Miller
 - Face Masks- Types & sizes
 - Various Endo- Tracheal Tubes- Types & Sizes
 - Supra-glottic Airway Devices e.g. LMAs, I-Gel
 - Stylet, Bougie
- Central Neuraxial & Peripheral Nerve Blocks
 - Various spinal needles-types & sizes
 - Various epidural needles-types & sizes
- Anesthetic drug pharmacology
- Emergency Medicines & crash cart
- Monitoring
 - Basic monitoring-ECG, NIBP, SpO₂, EtCO₂, temperature
- History of Anesthesia

Practical:-

- Vaporizers
 - Breathing circuits
 - Medical Gas Supply System
 - Suction
 - Face Masks- Types & sizes
 - Supra-glottic Airway Devices e.g. LMAs, I-Gel
 - Stylet, Bougie
 - Various spinal needles-types & sizes
 - Anesthetic drug pharmacology
 - Emergency Medicines & crash cart
 - Basic monitoring-ECG, NIBP, SpO₂, EtCO₂, temperature.
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Paper- 5– Biostatistics & Lab Management

(A) Biostatistics & (B) Lab Management

(A) Biostatistics

- Recognize and give examples of different types of data arising in public health and clinical studies
 - Interpret differences in data distributions via visual displays
 - Calculate standard normal scores and resulting probabilities
 - Calculate and interpret confidence intervals for population means and proportions
 - Interpret and explain a p-value
 - Perform a two-sample t-test and interpret the results; calculate a 95% confidence interval for difference in population means
 - Select an appropriate test for comparing two populations on a continuous measure, when two sample t-test is not appropriate
 - Understand and interpret results from Analysis of Variance (ANOVA), a technique used to compare means amongst more than two independent populations
 - Choose an appropriate method for comparing proportions between two groups; construct a 95% confidence interval for the difference in population proportions
 - Understand and interpret relative risks and odds ratios when comparing two populations
 - Understand why survival (timed to event) data requires its own type of analysis techniques
 - Construct a Kaplan-Meier estimate of the survival function that describes the “survival experience” of a cohort of subjects
 - Interpret the result of a log-rank test in the context of comparing the “survival experience” of multiple cohorts
 - Describe different kinds of studies
 - Understand confounding and interaction in studies
 - Use SPSS/STATA package to
-

(B) Lab Management

1. Quality Control of the product, chemicals, reagent.
2. Good, reliable, authentic report.
3. Total quality management framework of laboratory.
4. Essential elements of Quality Assurance Programme.
5. Internal Quality control: control of pre-analytical variables, control of analytical variables, laboratory precision, accuracy & sensitivity, validation of methods.
6. Reference materials and calibrating definitive methods.
7. Sources of variation in laboratory test results. Systemic and random errors.
8. Quality control charts: Levy-Jenning chart, Cusum chart and Gaussian curve.
9. Internal and external factors for quality control assurance.
10. Reference values.
11. Various types of laboratories.
12. Standard Bio-Medical Laboratory set up.
13. Management to the client, patient, physician, administrative authority.
14. Marketing management and economics related to Bio-medical laboratory science.
15. Management by objectives-Cost benefit analysis, cost effective analysis, cost accounting, input-output, analysis, system analysis, network analysis including PERT (Programme evaluation and review techniques) and CPM (Critical path method), PPBS (Planning programme budgeting system), work sampling, decision monitoring.
16. Cost of conformance & non-conformance.
17. Principles of management of employees relations.
18. Good laboratory management practices.
19. Improvement of laboratory operation.
20. Signage system in laboratory and hospital

Practical:-

- Describe different kinds of studies
 - Understand confounding and interaction in studies
 - Use SPSS/STATA package to
 - Interpret and explain a p-value
 - Calculate standard normal scores and resulting probabilities
 - Quality Control of the product, chemicals, reagent.
 - Essential elements of Quality Assurance Programme.
 - Various types of laboratories.
 - Standard Bio-Medical Laboratory set up.
 - Cost of conformance & non-conformance.
-

