Diploma in Operation Theatre Technology

Year I

Objectives of the Course
Operation theatre is one of the vital rooms of a health service facility. So the role of OT technician also resides on the most vital side. These technicians are not only responsible for handling the machinery related but also they are expected to handle the anesthesia part and maintain the records related. In addition to this they also help the patient by not only explaining the strategy related to the treatment but also they help them psychologically and emotionally.

Paper I : Pathology

Sr. No.	Topics	Hrs.
1.	Introduction to Clinical Pathology – Terminology, branches, importance of each branch	03
2.	Haematology – Composition, formation and function of blood.	05
3.	Blood Collection – Collection and preservation of blood for investigation. Anticoagulants used in hematology	05
4.	Hematocrit – Methods of measurement, indices (PCV, MCV, MCH, MCHC)	05
5.	Anaemia – Meaning and its detailed classification	05
6.	Estimation of Haemoglobin – Structure of haemoglobin, estimation (Methods based on development of color, oxygen combining capacity and iron content)	10
7.	Morphology of blood cells and their identification.	08
8.	Erythrocyte Sedimentation Rate (ESR) – Methods of measurement, factors effecting, significance of measurement	08
9.	Urine Analysis – Collection and preservation, physical, chemical and microscopic examination.	05
10.	Stool Analysis – Macroscopic, microscopic and chemical examination	05
11.	CSF Examination – Cell count (Leucocyte, differential count), biochemical examination of CSF	05

12.	Semen Analysis – Collection of sample, physical properties, motility of spermatozon, morphological examination of spermatozon	05
13.	Blood Banking – Techniques of blood collection, anticoagulants used in hematology, common aspects of immunohematology, 3 antigen antibody reactions, ABO blood group system	20
14.	Rhesus Blood Group System – Antigens, significance of Rh typing, slide technique	05
15.	Blood Transfusion – Pre-transfusion (compatibility testing), instructions, registration of donors, transfusion reactions, blood component transfusion	20
16.	Histopathology – Introduction with terminology, grossing meaning, ways and importance, lab safety and hazards	10
17.	Fixation – Aim, principles, types	05
18.	Decalcification – Importance and methods	05
19.	Tissue Processing – Meaning, importance and methods	05
20.	Hematoxylin – Properties (progressive and regressive), preparation methods. Eosin – Methods of staining, staining methods to demonstrate special/ specific tissues	10
21.	Cytology – Terminology, importance and introduction to fields of study.	05

Reference Books

1.	Robbins and Kumar Basic Pathology: First South Asia Edition	Kumar and Abbas	Elsevier
2.	Textbook of Pathology with Pathology Quick Review and MCQs	Harsh Mohan	Jaypee
3.	Textbook of Medical Laboratory Technology	Ramnik Sood	Jaypee

Paper II : Anatomy & Physiology

Sr. No.	Topics	Hrs.
1.	Terminology used in Anatomy, Bones – Names and location. Basic orientation and organization of human body from cell to organ system	06
2.	Human cells and tissues – Muscle, blood, gland, bone, nerve, reproductive cells and tissues – Organization and their functions	15

3.	Directional references of human body	02
4.	Body cavities – Dorsal and ventral	02
5.	Skeletal System – Terminology, position, basic details. Joints – Terminology, types, structure	20
6.	Integumentary System – Terminology, basics	02
7.	Gastrointestinal System – Terminology, position, structure, parts and their functions. Digestive process, absorption and defaecation.	10
8.	Respiratory System – Terminology, position, structure, parts and their functions, breathing mechanism.	10
9.	Urinary System – Terminology, position, structure, parts and their functions, process of urine formation and voiding.	10
10.	Male Reproductive System – Terminology, position, structure, parts and their functions	05
11.	Female Reproductive System – Terminology, position, structure, parts and their functions, menstrual cycle.	05
12.	Endocrine System – Terminology, position, structure, function and regulation of all hormones	10
13.	Brain and Spinal Cord – Terminology, structure, functions	05
14.	Blood – Terminology, composition, lymphatic details and clotting system.	05
15.	Sensory organs (eyes, ears, nose and tongue) – Terminology, functions.	10
16.	Cardiovascular System – Terminology, structure. Vessels entering and leaving the heart. Arterial and venous tree.	10
17.	Lymphatic System – Terminology, functions of WBCs, spleen, tonsils and lymph nodes	05
18.	Immune System – Terminology, components, mechanism of defense	05

Reference Books

1.	An Integrated Approach to Health Sciences	Colbert Bruce, Jeff Ankney, Joe Wilson, John Havrilla	Cengage Learning

2.	Human Physiology, Biochemistry and Basic Medicine	Laurence A. Cole, Peter R. Kramer	Elsevier
3.	Introduction to Human Anatomy and Physiology	Solomon. E.A.	Saunders: St Louis

III. Basic Science

Applied Physics

1.	Energy – Kinetic and potential energy, mechanical efficiency	05
2.	Basic Principles of Mechanics – Concept of force, pressure, mass and weight	10
3.	Properties of solids, liquids and gases	05
4.	Basic Concept of Electricity – Concepts of electricity as applicable in operation theatres, intensive care units etc.	05
5.	Static Electricity – Concept of charge, potential current, power and resistance.	05
6.	Basic Heat Principles – Concept of temperature, measurement and ways of heat dispersion. Relation of heat on rise and fall in temperature and its effect on human body. Handling rise and fall of human body temperature. Thermometry, thermistor and thermo-couple.	10
7.	Volume Concepts – Concept of volume, specific gravity, density and concentration.	05
8.	Gas Principles – Gas laws with their application the field, compressed gas and flow of gases	05
9.	Concept of Fluids – Fluids viscosity, law of laminar, flow rate, turbulent floor, critical Reynolds's member, resistance to laminar & turbulent flow. Loss of pressure due to abrupt change in bore in a tube. Principles of flow meters and types	05

Biochemistry

1.	Amino acids – Essential and non-essential with structure and function.	05
2.	Proteins – Structure (primary, secondary, tertiary, quaternary), functions, digestion and absorption of proteins (urea cycle and ammonia excretion).	08
3.	Lipids – Role, classification, digestion and absorption of lipids	05
4.	Fatty Acids – Essential and nonessential fatty acids and their	03

	role.	
5.	Enzymes – Classification, coenzyme, enzyme action and various factors effecting, significance of enzymes	05
6.	Carbohydrates – Definition, sources, classification, carbohydrate metabolism (glycolysis- Kreb's cycle, glycogenesis, glycogenolysis, gluconeogenesis), insulin and glucagon, intolerance of lactose.	10
7.	Vitamins – Classification (water and fat soluble with deficiency effects)	05
8.	Mineral – Major And Minor Minerals In Human Body (calcium, phosphorus, magnesium, iron, copper, zinc, fluoride, selenium, manganese)	08
9.	Hormone – Characteristics, various hormones and their functional importance.	10

Reference Books

1.	Text Book of Biochemistry	U Satyanarayana and Chakrapani	Elsevier
2.	Applied Physics 2: For Diploma Students	Er. Sandeep Saharan	E-book

IV. Emergency Management

1.	Emergency Medical Services (EMS) – Terminology, history and current trends	03
2.	Emergency Medicine – Terminology, specialty, basics, pros & cons	10
3.	Emergency Medical Services (EMS) – Traumatic injuries, Triage Hospital infection, Shock/ dehydration, hypoglycemia/hyperglycemia, and other conditions	20
4.	Emergency Medical Services (EMS) – ABCDE of primary survey.	10
5.	Emergency Medical Services (EMS) – Secondary survey	05
6.	Emergency Medical Services (EMS) – Medico-legal issues	05
7.	Emergency Medical Services (EMS) – Patient movement	03
8.	Emergency Medical Services (EMS) – Principles of life support and its basics and advanced. Pediatric life support, special resuscitation situations, safety during CPR training and actual rescue. Risk factors and	30

	prudent heart living. Cardiopulmonary resuscitation-basic & advanced, advanced cardiac life support, oxygen therapy, aerosol therapy, mechanical ventilation	
9.	Components of EMS	05
10.	Knowledge of equipment in emergency	10

Reference Books

1.	Introduction to Emergency Medicine	Elizabeth Mitchell, Ron Medzon	Williams and Wilkins
2.	An Introduction to Clinical Emergency Medicine	S. V. Mahadevan, Gus M. Garmel	Cambridge University Press