

DIPLOMA IN CRITICAL CARE TECHNICIAN 1ST YEAR

ANATOMY PHYSIOLOGY BIOCHEMISTRY

ANATOMY

INTRODUCTION TO ANATOMICAL TERMS ORGANIZATION OF THE HUMAN BODY

Human Cell structure

Tissues -Definition, Types, characteristics, classification, location, functions and formation

Membranes and glands -Classification and Structure

OSTEOLOGY

Upper limb –clavicle, scapula, humerus, radius, ulna

Lower limb -femur, hipbone, sacrum, tibia, fibula, Vertebral column

THORAX

Intercostals space, pleura, bony thoracic cage, ribs, sternum & thoracic vertebrae

HEART

Surface anatomy of heart

Chambers of the heart

Valves of the heart

Major blood vessels of heart

Pericardium

Coronary arteries

SKELETO-MUSCULAR SYSTEM

Muscles of thorax

Muscles of upper limb -(arm & fore arm)

Flexor and extensor group of muscles (origin, insertion, action) EXCRETORY SYSTEM

Kidneys

Urethras

Bladder

NERVOUS SYSTEM

Autonomic nervous system

Peripheral nervous system

Central nervous system

METHODS OF TEACHING

1. Lecture cum discussion

2. Demonstration

3. Lab visit

4. Practical work record

METHODS OF EVALUATION

1. Written Test
2. Record Book
3. Assignments
4. Oral Presentations

PHYSIOLOGY

1. THE CELL

Cell Structure and functions of the various organelles

Endocytosis and exocytose

Acid base balance and disturbances of acid base balances (Alkalosis, Acidosis)

2. CARDIO-VASCULAR SYSTEM

Physiology of the heart

Heart sounds

Cardiac cycle, Cardiac output.

Auscultatory areas.

Arterial Pressures, Blood Pressure

Hypertension

Electro cardiogram (ECG)

Blood

Composition of Blood, functions of the blood and plasma proteins,

Classification and protein

Pathological and Physiological variation of the RBC

Function of Hemoglobin

Erythrocyte Sedimentation Rate (ESR).

Detailed description about WBC-Total count (TC), Differential count (DC) and functions.

Platelets –formation

3. RESPIRATORY SYSTEM

•Respiratory movements

•Definitions and Normal values of Lung volumes and Lung capacities

4. EXCRETORY SYSTEM

•Normal Urinary output

•Maturation

•Renal function tests, renal disorders.

5. REPRODUCTIVE SYSTEM

•Formation of semen and spermatogenesis

•Brief account of Menstrual Cycle, oogenesis

6. CENTRAL NERVOUS SYSTEM

•Functions of CSF

•Reflexes

•Sympathetic and parasympathetic outflow

•Impulse conduction

•Structure of neuron

•Degeneration and regeneration of nerve fibers

•Cerebral blood flow

7. ENDOCRINE SYTEM

- Functions of Pituitary,
 - oThyroid,
 - oParathyroid,
 - oAdrenal
 - oPancreatic Hormones

8. DIGESTIVE SYSTEM

- Physiological Anatomy of the GIT
- Food Digestion in the mouth, stomach, intestine
- Absorption of foods
- Role of bile in digestion

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BIOCHEMISTRY

1. CARBOHYDRATES

Glucose and Glycogen Metabolism

2. PROTEINS

Classification of proteins and functions, Metabolism

3. LIPIDS

Classification of lipids and functions, Metabolism

4. ENZYMES

Definition & functions

Classification

Factors affecting enzyme activity

Active site – Coenzyme – Enzyme Inhibition – Units of enzyme

5. VITAMINS & MINERALS

Fat soluble vitamins (A, D, E, K)

Water soluble vitamins – B-complex vitamins – principal elements (Calcium, Phosphorus, Magnesium, Sodium, Potassium, Chlorine and sulphur) –

Trace elements – Calorific value of foods – Basal metabolic rate (BMR) – respiratory quotient (RQ) Specific dynamic action (SDA) – Balanced diet – Marasmus – Kwashiorkor

6. ACIDS AND BASES

- Definition
- pH Values
- Henderson – Hasselbalch equation
- Buffers

EMERGENCY MEDICINE & EMERGENCY MEDICAL SERVICES

INTRODUCTION TO EMS

- History of EMS & Current trends
- Understanding Emergency Medicine (the specialty, Its pros & cons)
- Roles & responsibilities of emergency medical technician
- Medico-Legal issues
Abandonment,
Sexual harassment,
Consent & referral Negligence
DNR orders, Coroner & medical examiner cases
- Principles of life support-basic and advanced
- Triage
- Critical points in functioning of EMS at a national level
- Required components of EMS system
- Existing EMS in India

ENGLISH, HOSPITAL & PATIENTS ORIENTATION, COMPUTER

ENGLISH

COMMUNICATION

Communication at the work place

Human needs and communication “Mind mapping “Information communication

COMPREHENSION PASSAGE

- Reading purposefully
- Understanding what is read
- Drawing conclusion
- Finding and analysis

EXPLAINING

- How to explain clearly
- Explaining procedures
- Giving directions

WRITING BUSINESS LETTERS

- How to construct correctly
- Formal language
- Address
- Salutation

- Body and Conclusion

REPORT WRITING

- Reporting an accident
- Reporting what happened at a session
- Reporting what happened at a meeting

PRACTICUM

- The clinical experience in the wards and bed side nursing will provide opportunity for students to fulfill the objectives of learning language
- Assignment on writing and conversation through participation in discussion debates seminars and symposia. The students will gain further skills in task oriented communication.

METHODS OF EVALUATION

1. Individual Oral presentations.
2. Group Discussion.
3. Answering questions front the prescribed English text.
4. Summary / Essay / Letter writing.
5. Medical / General Vocabulary exercises

METHODS OF EVALUATION

1. Individual oral presentations
2. Group discussion
3. Answering questions from the prescribed English text.
4. Summary / Essay / Letter writing
5. Grammar exercises
6. Medical / General Vocabulary exercises

HOSPITALS & PATIENTS: ORIENTATION

- History
- Classification
- Organization & structure
 - Doorway to the hospital department
- Departments & Team

Paramedical Staff

- Ancillary departments
- Lab
- Pharmacy
- Imaging
- Physio/speech/
- Patient support services
 - Admission
- Medical insurance
- Dietary
- Social services
- Health information management
- Medical records
- Electronic Medical Records
- Medico legal issues

COMPUTERS

INTRODUCTION TO COMPUTER

- Creating and Managing Professional Documents using Word
- Presenting and Managing Data effectively using Excel
- Creating and managing presentations using Power point
- Communicate and Manage tasks, contacts and Appointments Using Office Outlook
- Introduction to Digital Life Style

TYPING TEXT IN MS WORD

Inserting tables in a document

Formatting the text –using different font sizes, bold, italics

Bullets and numbering

Pictures, file insertion

Aligning the text and justify s

Choosing paper size

Adjusting margins

Header and footer, Inserting page No's in a document

Printing a file with options

Using spell check and grammar

CREATING TABLE IN MS-EXCEL

- Cell editing –Using formulas and functions
- Manipulating data with excel
- Using sort function to sort numbers and alphabets
- Drawing graphs and charts using data in Excel –Auto formatting –Inserting data from other worksheets

PREPARING NEW SLIDES USING MS-POWERPOINT

Inserting slides –Slide transition and animation –Using templates

Different text and font sizes –Slides with sounds –Inserting clip arts, pictures, tables and graphs–Presentation using wizards

INTRODUCTION TO INTERNET

- Using search engine –Google search –Exploring the next using Internet Explorer and Navigator –Uploading and Download of files and images –E-mail ID creation –
- Sending messages –Attaching files in E-mail

DIPLOMA IN CRITICAL CARE TECHNICIAN 2nd YEAR

PATHOLOGY, MICROBIOLOGY

PATHOLOGY

INTRODUCTION –CELL

- Cellular adaptation, Cell injury & cell death

- Overview: Cellular response to stress and noxious stimuli.
- Cellular adaptations of growth and differentiation
- Overview of cell injury and cell death
- Causes of cell injury
- Reversible and irreversible cell injury
- Examples of cell injury and necrosis

INFLAMMATION

- Historical highlights
- General features of inflammation
- Acute inflammation
- Chemical mediators of inflammation
- Outcomes of acute inflammation
- Chronic inflammation

3. IMMUNITY DISORDERS

- General features of the immune system
- Disorders of the immune system

4. INFECTIOUS DISEASES.

General principles of microbial pathogenesis

Viral infections –Dengue, Hepatitis

Bacterial infections-Rheumatic Heart Disease

Typhoid fever, Tuberculosis, Leprosy

Fungal infections

Parasitic infection –Malaria

Rickettial infections –Scrub typhus, Leptospirosis

5. NEOPLASIA

- Definitions
- Biology of tumor growth Benign and Malignant neoplasm's
- Carcinogenic agents and their cellular interactions

6. ENVIRONMENTAL AND NUTRITIONAL DISORDERS.

- Environmental and disease
- Common environmental and occupational exposures
- Nutrition and disease

7. CARDIOVASCULAR SYSTEM

- Coronary artery disease

8. SHOCK

- Mechanism & types –Anaphylactic, Distributive, Septic, Obstructive
- SIRS, SEPSIS

MICROBIOLOGY

1. INTRODUCTION

- Concepts and terminology
- Principles of microbiology

2. GENERAL CHARACTERISTICS OF MICROBES

- Structure and classification of Microbes
- Morphological types
- Size and forms of bacteria
- Motility
- Colonization
- Blood and body fluids
- Laboratory methods for identification of Microorganisms
- Staining techniques: Gram staining, Acid Fast staining, Hanging drop preparation
- Culture: various Medias

3. CLINICAL MICROBIOLOGY AND INFECTION CONTROL

INTRODUCTION -Importance of infection in an ICU, Agents causing Infection

SPREAD OF INFECTION Source; host; transmission, Bio hazardous materials Hospital acquired infections: Prevention & Universal precautions

Sterilization & Disinfection –concepts

Methods of sterilization

Spread of infection

Elimination of source -Cleaning and sterilizing equipments

Interrupting transmission of infection -role of Health Care Workers

Disposal of infectious wastes

•SPECIFIC INFECTIONS

HIV-AIDS

Hepatitis A, B, C

Tropical Infections -Tetanus, Malaria, Leptospirosis, Dengue, Sepsis, Chickungunya, Scrub typhus, Enteric fever, Tuberculosis

PHARMACOLOGY, CLINICAL MEDICINE

1. INTRODUCTION TO PHARMACOLOGY

Definitions

Sources

Common Terminologies used

Types / Classification

Pharmacodynamics: Actions, Therapeutics,

Adverse Effect, Toxic Effect

Pharmacokinetics: Absorption, Distribution, Metabolism, Interaction, Excretion

Review: Routes and principles of administration of drugs

Indian Pharmacopoeia (IP): Legal issues

Rational use of drugs

2. CLINICAL PHARMACOLOGY

•Drugs –Nomenclature

•Mode of action of drugs

•Routes of administration

•Drug dose calculation -Dilution, infusion rate

•Medical gases: O₂; N₂O

•Neuromuscular Blocking agents

- Antimicrobial drugs, Anti Viral and Anti Fungal agents -basic concepts –Antimicrobial
- Resistance
- Antiseptic agents

3. DRUGS USED FOR CENTRAL NERVOUS SYSTEM

- Sedatives, hypnotics, opioid analgesics, general anesthetics, CNS stimulants, anticonvulsants, local anesthetics, NSAIDS

4. DRUGS USED FOR AUTONOMIC NERVOUS SYSTEM

- Parasympathetic agents, Parasympathetic Blocking agents, Sympathetic Agents
- Sympathetic Blocking Agents

5. DRUGS USED FOR CARDIOVASCULAR SYSTEM

- Drugs for congestive cardiac failure, Antiarrhythmic drugs, Antihypertensive drugs
- Antianginal drugs, diuretics, Coagulants and Anticoagulants, Cardiac stimulants, Drugs used in the treatment of shock, Plasma expanders

6. DRUGS USED FOR ENDOCRINE AND METABOLIC DISORDERS:

- Insulin and oral antidiabetic agents, corticosteroids, thyroxin anti-thyroid drugs

7. DRUGS USED FOR RESPIRATORY SYSTEM

- Drugs for cough and bronchial asthma
- Respiratory stimulants, histamine & antihistamine

8. DRUGS USED FOR GASTRO INTESTINAL SYSTEM

- H2 antagonist, proton pump inhibitors, Antacids, Emetics and antiemetic
- Diarrhea.

9. GENERAL PRINCIPLES FOR THE TREATMENT OF POISONING

Drugs identification (spotters)

Identification of drugs by chemical test, poisoning symptoms & treatment

Route of drug administration

LIFE SUPPORT & RESUSCITATION, TRAUMA CARE

Basic life support in perspective

Cardiopulmonary function and actions for survival

Adult Basic life support, Advanced Cardiac life support

Pediatric Basic Life support

Special resuscitation situations (drowning, hanging, Pregnancy)

Safety during CPR training and actual rescue

The principles of kinetic energy Mechanism –Basic mechanics of Injury Pattern

Primary survey

Secondary survey as appropriate

Reassessment

Identification of Life threatening injuries

Shock –different types & Categories Revised trauma score, Glasgow Coma Score

Lifting & transporting of injured persons

Splints and Immobilization

TRIAGE, GENERAL EMERGENCY

Concepts and principles of Disaster Nursing

Causes and Types of Disaster:

Natural and Manmade Earthquakes, Floods, Epidemics, Cyclones Fire, Explosion, Accidents, Violence, Terrorism; biochemical, War

Policies related to emergency/disaster management; International, national, state, institutional

Disaster preparedness:

Team, Guidelines, protocols, Equipments, Resources

Coordination and involvement of; Community, various govt. departments, non government

Organizations and International agencies

Legal Aspects of Disaster

Impact on Health and after effects: Post Traumatic Stress Disorder

Rehabilitation; physical, psychosocial, Financial, Relocation

Concept, priorities, principles and Scope of emergency care

Organization of emergency services: physical setup, staffing,

Equipment and supplies, protocols,

Concepts of triage and role of triage person

Coordination and involvement of different departments and facilities

Principles of emergency management