



Jharkhand State Paramedical Council

RIMS Campus, Bariatu, RANCHI 834009

Tele-Fax:0651-2544027

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BASIC MEDICAL SCIENCES

Total Marks (100 Marks)

Part A (50 Marks)

ANATOMY

1. Body Skeleton and skull
2. Surface Anatomy-
 - (a) Anatomical Position of the Body
 - (b) Anatomical Planes
3. Histology
 - (a) Cell and its organelles.
 - (b) Ultra structure and function of cells
 - (c) cell division.
4. Basic embryology, development of human structure and congenital anomalies
5. Tissues: structure, position, classification, types and function of
 - i. epithelial tissue
 - ii. Glandular tissue
 - iii. connective tissue,
 - iv. Muscular tissue
 - v. Nervous tissue
6. Musculo skeleton system
 - (i) General feature of Bones, Cartilages, joints and Muscles
 - (ii) Structure and Fuctions of compact and cancellous bone
 - (iii) Anatomy and function of various muscle of face, neck, chest, back, Limbs, and Joints
 - (iv) Thoracic cage
 - (v) Axial and Vertebral Skeleton
7. Respiratory System-Parts of Nasopharynx, Larynx, Trachea. Bronchi, Lung
8. Gastrointestinal system Structure and function of –
 - (i)Salivary
 - (ii)Esophagus,
 - (iii) Stomach,
 - (iv) Small And Large Intestine,
 - (v) Liver,
 - (vi) Gall Bladder,
 - (vii)_Spleen
9. Cardiovascular system- Heart, Arterial system and Venous system
 - (i) Structure and Functions of Heart
 - (ii) Systemic and Pulmonary Circulation

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- (iii) Portal and Saphenous veins
10. Nervous system-
- (a) Central nervous system - Brief anatomical descriptions of
 - (i) Meninges and Ventricles
 - (ii) cerebrum ,
 - (iii) Brainstem - midbrain Pons and Medulla
 - (iv) Cerebellum
 - (v) CSF circulation
 - (vi) Cranial nerves
 - (vii) Spinal cord
 - (b) Autonomic nervous system – Sympathetic And Parasympathetic
 - (c) Peripheral nervous system-
 - (i) Connection and distribution of Spinal nerves
 - (ii) Overview of the Plexuses, Branches and Intercostal Nerves
11. Sensory organs- Eye, Ear, Nose, Tongue Throat and Skin
12. Lymphoid system - spleen, thymus, lymph node
13. Excretory System – Structure and Functions of Kidney, Ureter, Urinary Bladder and Urethra
14. Reproductive System
- (a) Male Structure and Functions of Scrotum , Penis, Testes, Spermatic cord, Seminal vesicle and Prostate
 - (b) Female Structure and Functions of Breast, External genitalia, Vagina, Cervix, Uterus Ovary and Fallopian tubes
15. Endocrine Glands : Structure and Functions of
- (i) Pituitary Gland
 - (ii) Adrenal Gland
 - (iii) Thyroid Gland
 - (iv) Pancreas
 - (v) Parathyroid Gland

PHYSIOLOGY

1. Functions of cell and cytoplasmic organelles
 2. Blood Vascular System
 - (i) Composition and Functions of blood
 - (ii) Hemoglobin – Function
 - (iii) Anemias – Different types and causes
 - (iv) Hematocrit- PCV, MCV, MCH & MCHC
 - (v) Blood volume – Normal Volume
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- (vi) Blood coagulation : Factors, anticoagulants, Prothrombin time, clotting time, bleeding time
 - (vii) Blood grouping : ABO system and RH factors
 - (viii) Blood Transfusion and hazards of blood transfusion
 - (ix) Plasma proteins – Normal value origin and Functions

3. Cardiovascular System

- (i) Hemodynamics of blood circulation
- (ii) Conducting System of Heart and ECG
- (iii) Cardiac cycle and cardiac output
- (iv) Heart sounds
- (v) Blood pressure – Regulation and controlling factors

4. Respiratory System

- (i) Mechanism of respiration
- (ii) Exchange of gases and regulation of Respiration
- (iii) Types and Physical changes in Hypoxic
- (iv) Pulmonary functions and spirometer

5. Digestive system

- (i) Organisation of GIT
- (ii) Movement of GIT
- (iii) Secretions of GIT
- (iv) Digestion and absorption of nutrients
- (v) Liver function Tests

6. Central Nervous System

(A) CNS

- (i) General organization of CNS
- (ii) Synapse and nerve Transmission
- (iii) Neuro transmitter
- (iv) Function of cerebral cortex
- (v) Motor and sensory pathways

(B) ANS

- (i) Brief outline of Sympathetic and para sympathetic System.
- (ii) Pregnancy : Hormonal changes in pregnancy. Tests for pregnancy
- (iii) Physiological Basis of family Planning method and contraceptives

7. Excretory System

- (i) Function of kidney
- (ii) Urine Formation and diuretics



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8. Muscles

- (i) Structure of skeletal muscles, cardiac muscle, smooth muscle.
- (ii) Excitation, contraction and coupling
- (iii) All or none law and effect of temperature
- (iv) Muscles contraction and Fatigue

9. Special Senses

- (i) Physiology of vision
- (ii) Physiology of Hearing
- (iii) Physiology of smell and taste

10. Endocrine Glands

- (i) Secretions and functions of different endocrine glands: Pituitary gland, Thyroid gland, Pancreas, Ovary, Testis.

Biochemistry

1. Chemical Structure classifications Functions and Metabolism of

- (i) Carbohydrate
- (ii) Proteins
- (iii) Lipids

2. Enzymes

- (i) Definition and General Characteristics
- (ii) Nomenclature and classifications
- (iii) Factors affecting Enzyme activity
- (iv) Co-enzyme
- (v) Enzyme Inhibition
- (vi) Enzyme Pattern in disease

3. Vitamins and Minerals

Sources, Daily acquirement, Metabolism, Functions and deficiency disease of

- (i) Fat soluble Vitamins (A, D, E, K)
- (ii) Water soluble vitamins (B Complex)

4. Basic outline of Hormone Action

- (i) Physical and Chemical Characteristics of Hormones
- (ii) Types of Hormones
- (iii) Sources and importance of different Hormones

5. Acid Base Balance, Water and electrolyte Balance

6. Basal Metabolic rate (BMR) and Respiratory Quotients (R Q)

7. Energy requirement

- (i) Nutritional Value of Food
- (ii) Food Supplement and balanced diet
- (iii) malnutrition – Marasmus, kwashiorkor





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Practicals

- (i) Specimen collection
- (ii) Maintenance of Laboratory Glassware and Apparatus including waterbath, oven, Incubator calorimeter etc.
- (iii) Biochemical Tests
 - (a) Blood sugar estimation
 - (b) Examination of Urine
 - (c) Gastric Analysis
 - (d) Thyroid Function Test
 - (e) Serum cholesterol and lipid Function Test

Pathology

1. Medical Terminology in Pathology
2. Instruments – Microscope /Colorimeter / Spectrophotometer/ Balance/ Fridge
3. Units of measurement
4. Solutions
5. Specimens and methods of collection
 - Basics of Lab principles & Procedures
 - Responsibilities of Lab worker Lab accidents Lab safety First aid
 - Automation in Pathology-Analyzers/ Histopathology
 - Blood in detail
6. Hematology
 - (i) Constituent and function of blood
 - (ii) Plasma
 - (iii) Routine hematological test
 - (a) Cell count : WBC / RBC /Platelet count
 - (b) Staining of blood film
 - (c) White cells and abnormal cells Total count and different count
 - (d) Red cell series
 - Morphology of RBC / reticulocyte count / ESR /Patched cell estimation
 - (e) Haemoglobin estimation
 - (f) Blood coagulation and anti coagulation laboratory investigation of bleeding disorder
 - (g) Blood transfusion
7. Other body fluids



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MICROBIOLOGY

1. Sterilisation and Disinfection
 - (i) Aseptic technique
 - (ii) Principles, Types and Methods
 - (iii) Pasteurisations
 - (iv) Antibiotics., Bacteriostatics and Bactericidal
 - (v) Hospital infection
 - (vi) Methods of disinfection of Laboratories, Operation theatres and wards
 - (vii) Methods of Sterilisation of lab glassware apparatus
 - (viii) Material used for Sterilisation and disinfection

2. Specimen Collection
3. Bacteria
 - (i) Cell Structure
 - (ii) Classification and morphological basis
 - (iii) Staining reactions – Gram Staining, acid fast Staining
 - (iv) Bacterial Growth
 - (v) Physical factor affecting culture media and growth culture
 - (vi) Basic idea about bactericidal agents
 - Phenol, Alcohol
4. Virus
 - (i) Basic knowledge of viral morphology, viral genome and classification
 - (ii) viral replication
 - (iii) Herpes virus
 - (iv) Adenovirus
 - (v) Human deficiency virus (HIV)
5. Fungi – Saprophytic and Pathogenic
6. Chlamydia and parasites
7. Culture media
8. Physiology, Pathology Treatment and epidemiology of infectious disease caused by bacteria, virus fungi and Parasitic organisms.

Practicals

1. Collection of specimen
 2. Serology
 3. Staining procedure – Gram staining of bacteria and Zeil Nelson's Staining
 4. Slide identification of non Virulent Bacteria and other pathogens
 5. Culture media for bacteria fungus and virus
 6. Oxidase Test
 7. Mantoux Test
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PHARMACOLOGY

1. General Principles of Pharmacology
 - Doses, Forms, Prescription writing
2. Basic concept of Pharmacodynamics and Pharmacokinetics
 - (i) Absorption and Bioavailability of drugs
 - (ii) Distribution of drugs
 - (iii) Metabolism, excretion and toxicity of drug
 - (iv) Mode of action of drug
 - (v) Factors modifying drug response
 - (vi) Adverse drug reaction
 - (vii) Drug interactions
3. Nature and source of drugs
4. Routes of drugs administrations
5. Sympathetic and Parasympathetic drugs
 - (i) Indications
 - (ii) Contra Indications
 - (iii) Side effects
6. Analgesics
7. General anesthetic, Pre-anesthetic and local anesthetic drug
8. Antibiotics and Antiepileptic drug
9. Antibiotics
10. Mode of action, Side effects, complication indication and contradiction of following drug
 - (i) Antifungal
 - (ii) Antiviral
 - (iii) Antibiotic
 - (iv) Antibacterial
 - (v) Antifungal
 - (vi) Antitubercular
 - (vii) Antileprotic
 - (viii) Anti Neoplastic
11. Drug Therapy in Acute emergencies



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Part B (50 Marks)


Preventive & Social Medicine

1. Concept of Health and diseases
 - (i) Concept : Biological to holistic Health
 - (ii) Definition, dimension and Spectrum
 - (iii) Determinates / risk factors
 - (iv) diseases : Theory of disease causation Natural history of disease
2. Nutrition and health – elementary idea about goal of nutrition in health, nutrients food, balanced diet, requirements, healthy cooking practices, clean cooking procedure, Indian food beliefs and taboos, nutritional disorders
 - (i) Applied aspects of nutrition, food fortication, food additives, food preservations, food toxicants, food and nutrition related Acts and regulatory agencies, healthy and unhealthy food habits
3. Physical activities, exercise and relationship with health
4. Sociology and Health
5. Environment and Health
6. Concept of Prevention and control of disease
7. Communicable disease
8. Non communicable disease
9. First Aid
10. Immunity and Immunization
11. Demography and health Survey Registration of Birth, Death, Public health care
12. Public health administration
13. Health education
14. Health Statistics

Forensic Medicine

1. Medico legal responsibilities of Paramedics in rural and urban health centre.
2. Medico legal aspects of death including changes after death.
3. Mechanical Injuries and their medico legal aspects
4. Sexual offences and Perversions, Sex determination Tests, Medical termination of Pregnancy
5. Common Poisons
General Principle of management of Poisoning snakes, scorpion and Insect bite
6. Examination of Bones, teeth to determine age, sex and stature
7. Finger Prints

Hospital Awareness

1. Healthcare delivery system
 2. Hospital Organization
 3. Patient related services
 4. Registration of OPD and IPD
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5. Maintenance of records
 6. General Patient Care
 - (i) Patients caring
 - (ii) Knowledge of nursing of patients
 - (iii) Vital signs
 - (iv) Admission and discharge Process
 - (v) Development of ethical values and overall professional sense.

Computer Awareness

Course Objectives

1. Comprehend the parts of a computer and the different operating systems.
2. Utilize the MS word for typing letters and text.
3. Effectively use features in MS word to manipulated text and insert pictures and various fonts.
4. Prepare and use effectively a Power Point presentation
5. Utilize the internet for web searches and e-mail
6. Appreciate the contribution of HIS to the healthcare industry
7. Describe the uses of the hospital information system

Basics of Computer

Module 1 : Introduction to the Computer

Parts of a computer, I/O devices – memories - RAM and ROM. Networking – LAN, WAN, (only basic ideas)

Module 2: Introduction to Microsoft Word

Typing text in MS word, manipulating text, formatting the text & using different font sizes bold, italics. Using Bulletes and numbering insertion of pictures & file insertion. Aligning of the text and justify.

Module 3 Microsoft Power Point

Preparing new slides using MS Power Point. Inserting slides, slide transition and animation. Using templates, different and font sizes. Inserting slides with sounds, inserting clip arts, pictures, tables and graphs. Presentation using wizards

Module 4 Introduction to the internet

Definition about the World wide & brief history. Using search engine and beginning Google search – Exploring the next using internet explorer and Navigation – Uploading and Download of files and images E-mail ID creation – Sending messages – Attaching files in E- mail.

Module 5 : Introduction to the hospital Information System

Definition of Hospital Information system, Architecture of a HIS, aim and uses of HIS, types of HIS Benefits of using a hospital information system.



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Basics of Computer (Practical)

Module 1: Introduction to Microsoft Word

Type a text of document save the document. Align the text with different formats. Align the text with different formats using Microsoft Word. Inserting a table ensuring Proper alignment of the table using MS word.

Module 2: Microsoft Power Point

Preparing a slide show with transition, animation and sound effect using MS – Power point. Customizing the slide show by inserting pictures and tables in the slides using MS – Power Point.

Module 3: Introduction to the Internet

Create an e – mail account. Use the internet to search for a subject of interest.