HIMALAYAN UNIVERSITY, ARUNACHAL PRADESH

DIPLOMA IN PARAMEDICAL

(ECG TECHNICIAN)

1st YEAR

1st Semester

S. NO.	SUB. CODE	SUBJECT NAME	MARKS			
			INTERNAL	THEORY	TOTAL	PASS
1	101	General English	30	70	100	40
2	102	Human Anatomy	30	70	100	40
3	103	Physiology	30	70	100	40
4	105	Practical	30	70	100	40

2nd Semester

S. NO.	SUB. CODE	SUBJECT NAME	MARKS			
			INTERNAL	THEORY	TOTAL	PASS
1	201	Fundamentals of Computer Science	30	70	100	40
2	202	Pharmacology	30	70	100	40
3	203	Clinical Cardiology				
4	205	Practical	30	70	100	40

2nd YEAR

3rd Semester

S. NO.	SUB. CODE	SUBJECT NAME	MARKS			
			INTERNAL	THEORY	TOTAL	PASS
1	301	Environmental & Bio Medical Waste Management	30	70	100	40
2	302	Pathology & Terminology	30	70	100	40

3	303	Equipments & Machinery	30	70	100	40
4	304	Practical	30	70	100	40

4th Semester

S. NO.	SUB. CODE	SUBJECT NAME	MARKS			
			INTERNAL	THEORY	TOTAL	PASS
1	401	Electricity & Electrocardiogram	30	70	100	40
2	402	Hospital Practice & Patient Care	30	70	100	40
3	403	Electrocardiography & Technique	30	70	100	40
4	404	Practical	30	70	100	40

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DIPLOMA IN PARAMEDICAL

(ECG TECHNICIAN)

1st YEAR

1st Semester

General English (101)

Module 1

Communication

Definition of communication, need for communication its classification and purpose. Various barriers of communication and major difficulties in communication the characteristics of successful communication – The seven C's the human needs and communication "Mind mapping". Information communication in the health care set up (Interacting with Patients suffering from acute or chronic renal failure, People within same Hospital/Clinic/ health care unit, renal specialists, nurses, other technicians and staff).

Module 2

Comprehension Passage

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

Module 3

Explaining

How to explain clearly - Defining and giving reasons - Explaining differences - Explaining procedures - Giving directions

Module 4

Writing a letters

Types of letters – Business letters - How to construct correctly - Formal language – Address – Salutation – Body - Conclusion

Module 5

Report writing

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

Module 6

Conversational English Exercises

Self introduction, Explanation of various procedures, reporting of any mishap, explaining to a patient, conversing with the doctor on patient care status

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Human Anatomy (102)

Module 1

Introduction to anatomy

Scope of Anatomy and Physiology - Definitions and Terms in Anatomy and Physiology- Structure and function of human cell - Elementary tissues of human body- Brief account on Composition of Blood - functions of blood elements - Blood Group and coagulation of blood, Inflammation, Cellular adaptation, Cell injury & cell death.

Module 2

Cardio Vascular System

Structure and functions of various parts of the heart, arterial and venous system, brief account on common cardiovascular disorders

Module 3

Respiratory System

Various parts of respiratory system and their functions, Physiology of Respiration

Module 4

Digestive System

names and various parts of digestive system-Liver, Spleen, Gall Bladder, Pancreas, Buccal Cavity, Pharynx, Esophagus, Stomach, intestine etc.-physiology of digestion and absorption

Module 5

Urinary System

Various parts of urinary system and its function-structure and function of kidneys-physiology of urine formation - path physiology of renal disease and edema

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Physiology (103)

Module 1

Reproductive System

Physiology and anatomy of Male & Female reproductive system-Prostate & Uterus & Ovaries etc

Module 2

Musculoskeletal System

Classification of bones & joints, structure of skeleton –structure of skeletal muscle – physiology of muscle contraction

Module 3

Nervous System

Various parts of nervous system- Brain and its parts –functions of nervous system - Spinal Cord & Nerves

Module 4

Ear, Nose, Throat and Eye

Elementary knowledge of structure and functions of organs of taste, smell, hearing, vision

Module 5

Endocrine System

Endocrine glands, their hormones and functions-Thyroid, Parathyroid, Suprarenal, Pituitary, pituitary and Thymus

Module 6

Haemopoietic and Lymphatic System

Name of the blood vessels & lymph gland locations

Module 7

Surface Anatomy & Surface Markings of Human Body

Practical (104)

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2nd Semester

Fundamentals of Computer Science (201)

Module 1

Introduction to the Computer

Parts of a computer, I/O devices – memories – RAM and ROM. Networking – LAN, WAN, MAN (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 Bullets and numbering, insertion of pictures, & file insertion. Aligning of the text and justify.

Module 3

Microsoft PowerPoint

Preparing new slides using MS-PowerPoint Inserting slides, slide transition and animation Using templates, different text 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 Web & brief history Using search engine and beginning 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

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.

Pharmacology (202)

Module 1

IV fluid therapy with special emphasis in renal diseases

Define IV fluids, differentiate the various IV fluids. Use of crystalloids and colloids in renal diseases Mode of action, contraindication, precautions and side effects of using various IV fluids

Module 2

Diuretics

Introduction to diuretics, definition, classification, actions, dosage, side effects & contraindications

Module 3

Anti hypertensive's

Definition, classification, actions, dosage, side effects & contraindications, special reference during dialysis, vasopressors, drugs used in Hypotension

Module 4

Drugs & dialysis

Dose & duration of drugs used in dialysis. The administration of drugs and the effect of dialysis on the action of drugs

Module 5

Dialyzable drugs

List of drugs that are dialyzable, action, dosage, side effects and contraindications of phenobarbitone, lithium, methanol etc

Module 6

Erythropoietin

History of the development and use of erythropoietin Its action, function - Primary role in RBC formation and secondary role Mechanism of action - synthesis and regulation - Indications for use - available forms and dosages

Module 7

Heparin including low molecular weight heparin

Introduction to heparin and Low molecular weight heparin Description of Heparin & LMWH, pharmacokinetics, mode of action, indications and use, dosage and route of administration & side effects

Module 8

Protamine sulphate

Introduction to protamine, mode of action, pharmacokinetics, indications, uses, dosage, route of administration, side effects, precautions, contraindications

Module 9

Fomalin, sodium hypochlorite, hydrogen peroxide

Action, characteristics, the use of the drugs and its role as disinfectants & adverse effects of residual particles applicable too formalin

Module 10

Haemodialysis concentrates

Composition & dilution (acetate & bicarbonates)

Module 11

Peritoneal dialysis fluid in particular hypertonic solutions – composition

Fluids used in peritoneal dialysis, the composition and strength of concentration. Mode of action, uses, indications and precaution

Module 12

Potassium exchange resins with special emphasis on mode of administration

Introduction to potassium exchange resins, chemical composition. Types, mode of action, indications for use, side effects, precautions and contraindications

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Clinical Cardiology (203)

1. Coronary artery disease
2. Rheumatic heart disease
3. Congenital heart disease and other paediatric cardiac disorders
4. Pericardial diseases
5. Cardiac arrhythmias
6. Heart failure
7. Peripheral vascular disorders
8. Pulmonary thromboembolism and pulmonary hypertension
9. Systemic hypertension
10. Systemic diseases involving heart
11. Heart muscle diseases
12. Traumatic heart disease
13. Tumors of heart
14. Genetics, molecular biology and immunology related to cardiology
15. Geriatric heart disease
16. General anaesthesia and non cardiac surgery in patients with heart disease
17. Pregnancy and heart disease
18. Epidemiology and preventive cardiology

Practical (204)

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2nd YEAR

3rd Semester

Environmental & Bio Medical Waste Management (301)

1. **Environment Introduction:**

Biotic and Abiotic environment, Adverse effects of Environmental Pollution, Control Strategies, Various Acts and Regulation

2. **Water Pollution:**

Water Quality Standards for potable water, Surface and underground water sources, Impurities in water and their removal, Denomination, Adverse effects of domestic waste Water and industrial effluent to surface water sources, Eutrophication of lakes, Self Purification of steams

3. **Air Pollution:**

Sources of air contaminations, adverse effects on human health, Measurement of air quality Standards and their permissible limits, Measure to check air pollution, Greenhouse effect, Global warming, Acid rain, Ozone depletion

4. **Bio Medical Waste:**

Bio Medical Waste Management, Introduction to bio medical waste, Types of bio medical Waste, Collection of bio medical waste

5. **Land Pollution:**

Land Pollution, Soil conservation, Land erosion, Forestation

6. **Ecology:**

Ecology, Basics of species, Population dynamics, Energy flow, Ecosystems, Social Issues And the Environment, Sustainable development and Life Styles, Urban problems 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

7. **Renewable Sources of Energy:**

Non-Conventional (Renewable) source of energy, Solar Energy, Wind energy, Bio mass Energy and Hydrogen energy

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Pathology & Terminology (302)

1. **Understanding Blood Related Diseases:** Leukemia – Introduction and Classification Myelodysplastic Syndromes Preleukemic Conditions Hemophilia Thalassemia Sickle Cell Anemia Blood Poisoning

2. **Laboratory Methods Used In Investigation of Hemolytic Anemia:** Osmotic Fragility Investigation of G-6 PD deficiency Test for sickling Estimation of HB-F, Hb-A2 Plasma Hemoglobin and Haptoglobin Demonstration of Hemosiderin in Urine Hemoglobin Electrophoresis Test for Auto Immune Hemolytic Anemia Measurements of Abnormal Hb Pigments

3. **Origin, Formation and Circulation of Blood Cells:** Science of blood cell formation Bone marrow Sites Hematopoiesis, Anemia introduction and classification Megaloblastic Anemia, Iron deficiency anemia and other Hypochromic Microcytic Anemia's Hemolytic Anemias I – Introduction and Classification Aplastic Anemia Anemia of chronic disorders Malaria Bleeding disorders – Introduction and Classification- Congenital Bleeding Disorders Acquired Bleeding Disorders

4. **Blood Banking:** Blood Group System Blood Group Incompatibility—ABO, Rh & Systems Cross Matching Test in emergency Blood Bank Preparation of Blood- Preparation and use of whole blood Blood components washed red cells Plasma preparation Blood Collection Procedure Screening, Selection and Care of Donor Medical Registration and Physical Examination Transport and Storage Risk assessment for AIDS and Serum Hepatitis

5. **Blood Grouping**: ABO RH and others system of blood groups, Bombay group.

Antibodies to ABO system Anti AB and Anti D Antibody, ABO Testing slides and tube test, Rh grouping test and slide,

6. **Cross Matching:** Reasons of Cross Match Roles, formation and methods of checking followings- Saline Albumin Comb's Enzymes Comb's test

7. **Pathological Analysis:** Analysis of Body fluids Analysis of Semen Sputum Analysis Stool Analysis Urine Analysis

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Equipments & Machinery (303)

UNIT -I

Surgery and Instruments:

Common manifestation and management of patient ECG interventions, Cleft lip palate, Acute appendicitis, Urethral strictures, Different Surgical Instrument, Instruments used in major surgical operations including Biliary Tract Surgery, Anorectic Surgery, Urological Surgery, and Orthopedic Surgery Instruments.

UNIT -II

Sterilization and Disinfections in O.T:

General Surgical Principles and Instruments, The surgical patient operation room technique

UNIT -III

Surgical Instruments-

Instruments used for preparing Surgical Cheatles forceps, Rampleys sponge, Holding forceps, Mayo's towel clip, Esmarch bandage, Simple tourniquet, Pneumatic tourniquet.

UNIT -IV

Incision making method and Instruments-

Bard parker knife handle, Major abdominal incision, Artery forceps and their types, Instruments used in homeostasis, Kocher's forceps and Electrocautery

UNIT -V

Retractor-

Single hook retractor, Czerny's retractor's, Nerve hooks retractor, Morris retractors, Deaver's retractors.

UNIT -VI

Equipments and Machinery:

Care, Washing, Sterilization and Maintenance of Endoscopic Instruments, Orthopedic Power instruments, Advanced OT tables & their attachment, Types setting & Use of Image Intensifier Portable X-ray Machine, Cautery Machine, suction machine, pulse oxymeter, cardiac monitor.

UNIT -VII

Wound Management:

Scissors and its types, Sucking material and techniques, Disinfectants and Irritant dressing 4 procedures, Different types of bandages, Surgical needle & needle holders, Various types of suture material.

Practical (304)

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4th Semester

Electricity & Electrocardiogram (401)

UNIT -I

Circuits and Units:

Simple electron theory of conductions, Resistance, The Joule, The watt, Properties of electric charge, Capacitor, Electronic potential/potential difference (PD), Type of AC/DC, and Basics of AC Circuits

UNIT -II

Electro Magnetism:

Magnetism/ Electro Magnetism/Electromagnetic Induction, Magnetic poles/ fields/ flux and influx density, Magnetic field due to a straight and circular coil wire, Relationship of the electrocardiogram to the electrical events of the heart, Relationship of the electrical events to the mechanical events of the cardiac cycle, Waveform components (P, Q, R, S, T and U), Definitions and normal ranges of PR interval and QRS duration, Measurement of QT interval and calculation of corrected QT interval (QTc) by Bazett.s formula, Calculation of the heart rate from the electrocardiogram

UNIT -III

Electrocardiogram:

The appearance of the normal resting electrocardiogram, Recognizing the normal variations of the electrocardiogram in relation to Age, State of activity, Body built Ethnic origin. Recognizing the normal electrocardiogram and some common abnormalities- Rhythms arising from the sinus node, Normal sinus rhythm, Sinus arrhythmia, Sinus tachycardia, Sinus bradycardia, Sinus arrest, Supraventricular tachyarrhythmias, Atrial premature contractions (ectopics), Atrial tachycardia, Atrial flutter, Atrial fibrillation, Supraventricular tachycardia, Accelerated AV nodal (junctional rhythm). Conduction Abnormalities-

Ventricular pre-excitation, Left and right bundle branch block, 1st degree AV block, 2nd degree AV block: Mobitz I (Wenckebach), Mobitz II and 2:1 block, 3rd degree (complete) AV block.

UNIT -IV

Rhythms arising from the ventricles:

Ventricular escape beats, Ventricular premature beats (ectopics), Ventricular tachycardia, Ventricular flutter, Ventricular fibrillation, Ventricular standstill (asystole), The electrocardiogram associated with an artificial cardiac pacemaker, Identification of pacemaker, Stimulus on the electrocardiogram, Differentiation between atrial and ventricular pacing, Interpretation of changes in the electrocardiogram arising from abnormal cardiac conditions, Myocardial ischaemia, Myocardial infarction, Left ventricular hypertrophy, Pericarditis, Dextrocardia, Essential ECG Interpretation.

UNIT -V

ECG Diagnosis:

Complete heart block, Left bundle branch block, Right bundle branch block, Ventricular fibrillation, Atrial fibrillation, Ventricular tachycardia, Narrow complex tachycardia, Acute ST elevation, myocardial infarct.

UNIT -VI

Aims and objective of first aids wounds and bleeding:

Dressing and bandages, Pressure and splints, Supports etc, Shock insensibility, Asphyxia, Convulsions, Resuscitation, Use of suction apparatus, Drug reactions, Prophylactic, Measure administration of oxygen, Electric shock, Burns, Scalds, Hemorrhage, Pressure points, Compression band, Fracture splints, Bandaging, Dressing, Foreign bodies poisons.

UNIT -VII

Infection:

Bacteria their nature and appearance, Spread of infections, Auto infection or Cross infection, The inflammatory process, Local tissue reaction, General body reaction, Ulceration aspects and Antisepsis.

Hospital Practice & Patient Care (402)

UNIT -I

Hospital Procedure: Hospital staffing and organization, Records relating to patients and departmental statistics, 1 Professional attitude of the technologist to patient and other members of the staff, Medico legal aspects, Accident in the department, Appointment, Organization, Minimizing waiting time, Outpatient and follow ups to clinics, Stock taking and Stock keeping.

UNIT -II

Care of the Patient: First contact with patients in the department, Management of chair and stretcher, Patients and aids for this, Management for the unconscious patient, Elementary hygiene, Personal cleanliness, Hygiene in relation to patient (for example clean linen and receptacles), Nursing care, Temperature, Pulse and Respiration, Essential care of the patient who has a Tracheotomy, Essential care of the patient who has Colostomy, Bedpans and Urinals, Simple application of a Sterile Dressing.

UNIT -III

Aims and objective of First Aids: Wounds and bleeding, Dressing and bandages, Pressure and splints, Supports etc., Shock insensibility, Asphyxia, Convulsions, Resuscitation. Use of suction apparatus, Drug reactions, Prophylactic measures, Administration of oxygen, Electric shock, Burns, Scalds, Hemorrhage, Pressure points, Compression Band, Fracture, Splints, Bandaging, Dressing, Foreign bodies poisons.

UNIT -IV

Infection: Bacteria their nature and appearance, Spread of infections, Auto infection or Cross infection, The inflammatory process, Local tissue reaction, General body reaction, Ulceration aspects and Antisepsis.

UNIT -V

Principles of Asepsis: Sterilization, Methods of sterilization, Use of central sterile supply, Departmental care and Identification of Instruments, Surgical dressings in common use including Filament Swabs, Elementary Operating Theatre procedure, setting of trays and trolleys in the Radiotherapy Department.

Electrocardiography & Technique (403)

UNIT -I

Introduction to Electrocardiography:

History, psychological basis of E.C.G. conduct, Velocity, Electrophysiology, Central of Wilson augmentation Esophageal, lead Pathway of Activation, Vector Concept.

UNIT -II

Normal Electro gram:

Atrial complexes, P-R interval, QRS Complex S.T. Segment T-Wave U-wave Q-T- interval, Electrical Axis, Heart Position Interprection of an ECG, How to record and ECG.

UNIT -III

Abnormal Electrocardiogram:

Abnormal P-Wave Intraventricular Conduction Defect, RBBB, LBBB, Incomplete LBB, LAHB, LPPHB, Non specific Interventricular Condition, Defect Bilateral Bundle, Branch Block, Trifasicular Block, WPW Syndrome, LLawn ganogn, Levine Syndrome, Mahim by Pass Hypertrophy, Right Ventricular Hypertrophy (RVH), Pulmonary embolism, Chronic Obstructive lung Disease (COLD), Biventricular Hypertrophy, Overload Concept, Diastolic Overload.

UNIT -IV

Coronary Artery Diseases:

Ischemia Injury, infracting, subtle, atypical, non specific Pattern conduction, defects and infraction, localization of infraction, vpm and acute myocardial infarction, atrial infraction, VCG in myocardial, coronary insufficiency cerebrovascular accident, hypothermia, pericarditis, myocarditis neuromuscular disease, heart trauma malignancy involving heart electrical alter nana negative vales, liquid protein diet, anemia etc.

UNIT -V

Disorder of Cardiac Rhythm:

Disturbance of impulse formation, Disturbances of impulse conduction, Secondary disorders of rhythm, Physiology of cardiac rhythm, Automacity conductivity A-V nodes, Sinus rhythm, Sinus tachycardia, Sinus bradycardia, Sinus arrhythmia, Sino atrial block, Partial 6 Sa block, Complete SA block, Causes of Exit block, Atrial extrasystoles, Blocked atrial, Premature beats, Cause of Atrial Tachycardia (PAT) Chaotic Atrial Rhythm; Atrial flutter, Atrial fibrillation, Supraventricular tachycardia (SVT), Ventricular rhythm, Ventricular Tachy Cardia (VT), Ventricular Fibrillation Proarrhythmia; Parasystole, Group beating; AV-Dislocation, torsade de points, Sick sinus syndrome.

UNIT -VI

Abnormality:

ECG as a clue to clinical diagnosis, Pulmonary stenoriss tricuspid tatresia atrial spetal 7 defect, Ventricular spetal defect, Ebstein anomaly, Correct transportation of great vessel

mirror image, Dextrocaridsm, Anomalous origin of left cornaro artery, Rheumatic fever, Mitrial value, Prolapsed athlete's heart, Cardiac pacing act.

Practical (404)

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