FUNDAMENTALS OF HUMAN ANATOMY & PHYSIOLOGY (THEORY)
Course Code: ANA/PHY.101T
Credit Hours: 3
Semester: I

SECTION I: HUMAN ANATOMY

UNIT-I : Structure & function of human body (2 Lectures)

- Definitions, Subdivisions of Anatomy, Terms of location and position, Fundamental Planes, organization of human body. Cell (structure & function). Tissues (Epithelium, Connective, Muscular, Nervous)

UNIT- II : Locomotion and support (2 Lectures)

- *Skeletal system:* Types of bones, Bones and their parts, Divisions of skeleton
- *Joints:* classification, types of movements with examples.

UNIT- III : Nervous system (2 Lectures)

- *Central nervous system*: Spinal Cord (anatomy, functions), reflex- arc, meninges.
- *Brain:* Hind Brain, Midbrain, Forebrain.

UNIT-IV : Sensory System (2 Lectures)

- Anatomical introduction to skin & Sense organs: Eye, Ear, Nose

UNIT-V : Circulatory system (2 Lectures)

- *Heart:* size, location, coverings, chambers, blood supply, the blood vessels. General plan of circulation, pulmonary circulation. Names of arteries and veins and their positions.

UNIT- VI : Respiratory system (2 Lectures)

- Organs of Respiratory System. Brief knowledge of parts and position
- *Conducting portion:* Nose, nasal cavity, Para nasal air sinuses, Larynx, trachea, bronchial tree.
- *Respiratory portion:* Pleura and lungs.

UNIT- VII: Digestive system (2 Lectures)

- Components of Digestive system, Anatomy of organs of digestive system, mouth, tongue, teeth,
- salivary glands, liver, biliary apparatus, pancreas.

UNIT- VIII: Excretory system (2 Lectures)

- *Kidneys:* location, gross structure, excretory ducts, ureters, Urinary bladder, Urethra.

UNIT- IX: Reproductive system (2 Lectures)

- *Male Reproductive System:* Testis, Duct system.
- *Female Reproductive System:* Ovaries, Duct system

UNIT- X : Endocrine system (2 Lectures)

- *Endocrine glands:* Positions, Hormones secreted and their functions- Pituitary, Thyroid parathyroid, Adrenal glands, Gonads & Islets of pancreas

SECTION II: HUMAN PHYSIOLOGY

Unit I – Cell **(1 Lecture)**

Cell membrane& cytoplasmic organelles- Functions

Unit II – Blood **(4 Lecture)**

Composition and function of blood

Blood Cells- Types, structure and functions

Blood group- ABO Blood group & Rh factor, Blood groups and uses of blood grouping. Rh incompatibility

Blood Clotting: Definition, Mechanism of haemostasis, Physiology of clotting mechanism.

Anemia- Definition, Types and Clinical features of anemia.

Unit III – Cardiovascular System **(3 Lecture)**

Functions of heart and blood vessels

Heart rate :- Definition and factors affecting it

Cardiac cycle: Definition and events in the cardiac cycle, Heart sounds

Unit IV - Respiratory System **(2 Lecture)**

Functions of Respiratory organs

Mechanism of Respiration: Inspiration & expiration, Muscles of Inspiration & Muscles of expiration, Accessory muscles of Respiration

Lung Volumes and Capacities: Vital Capacity, Tidal Volume, Residual Volume

Unit V – Gastrointestinal system **(3 Lecture)**

Functions of various parts of GIT

Digestion & absorption of carbohydrates, fats, protein in various parts of GIT

Functions of Saliva, Gastric Juice, Bile, Pancreatic Juice

Functions of Liver , Gall Bladder and Pancreas

Movements of Small Intestine and large Intestine

Unit VI - Excretory System **(4 Lecture)**

Functions of kidney, ureters, urinary bladder and urethra

Nephron & Function of various parts

Mechanism of Urine Formation

Unit VII – CNS **(4 Lecture)**

Introduction: Organization and function of the nervous system

Central Nervous System: General Description- Cerebral hemisphere (cerebrum); Basal ganglia, Thalamus; Hypothalamus, Brain stem: Medulla; Pons, Mid Brain; Reticular formation, Cerebellum, Spinal Cord: Structure and function; Ascending (sensory) tracts; Descending (motor) tracts, Cerebrospinal fluid (CSF)

Peripheral nervous System: Somatic nervous system: Spinal nerves; Reflexes: Mono and Polysynaptic reflex; Cranial nerves

Autonomic nervous system (ANS): Sympathetic, parasympathetic

Unit VIII - Muscular System **(4 Lecture)**

Structure & Functions of skeletal muscle, smooth muscle & Cardiac muscle

Skeletal Muscle: -Action Potential, Excitation contraction coupling, Muscle tone, Neuro- Muscular Junction

Unit IX – Endocrine System **(5 Lecture)**

Hormones: GH, Thyroid Hormones, Parathyroid Hormones, Insulin, Glucocorticoids, Mineralocorticoids, ADH, oxytocin, Testosterone – their source & actions

FUNDAMENTALS OF HUMAN ANATOMY & PHYSIOLOGY (PRACTICAL)
Course Code: ANA/PHY.101P
Credit Hours: 1.5

- Identification and description of all anatomical structures.
- Demonstration through slides, models, charts etc..
- Measurement of pulse, blood pressure
- Identification/counting of blood cells by study of peripheral blood smear
- Determination of blood groups, bleeding/clotting times. Estimation of Hb

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

CONCEPTUAL MICROBIOLOGY & PATHOLOGY (THEORY)
Course Code: MIC/PAT.102T
Credit Hours: 3
Semester: I
SECTION I : MICROBIOLOGY

UNIT- I: Origin and Evolution of Microbiology (3 Lectures)

- Introduction, History & scope of Microbiology
- General characteristics of Microorganisms: Bacteria, viruses, fungi.

UNIT - II: Study of Common Lab Instruments (3 Lectures)

- Microscope: Types , principles & uses
- Autoclave, Hot air oven, Incubator, Laminar air flow, Colony counter : Principles & uses

UNIT III: Morphology of Bacteria & Viruses (3 Lectures)

- *Bacterial anatomy:* Cell wall, Cell membrane, Capsule, Flagella, Nucleoid, Bacterial Spore.
- Structure of viruses, Concepts of replication & cultivation
- Study of bacteria: Preparation of Stains, various Staining techniques (Simple staining, Gram staining, Acid-fast staining, Negative staining & Albert staining).

UNIT- IV: **Growth & Nutrition of bacteria: (3 Lectures)**

- Culture media and Culture methods
- *Bacterial Growth:* Growth Curve, Generation Time, Environmental factors affecting growth.
- Bacterial nutrition: Nutritional groups, Common Nutritional requirements

UNIT- V: Control of Microbial Growth (3 Lectures)

- Sterilization and disinfection

UNIT-VI: Immunity & Infection (3 Lectures)

- *Immunity:* Types of immunity, Antigens & Antibodies, Prophylactic Immunization
- *Infection:* Types, Various routes & modes of transmission, Nosocomial Infections

UNIT-VII: Biomedical Waste & Management (2 Lectures)

- Waste categories, Waste treatment & disposal

SECTION II : PATHOLOGY

UNIT-I: Introduction (1 Lectures)

- Definition, important terminology, different branches

UNIT-II: Cell Injury and Cellular Adaptations (4 Lectures)

- *Cell Injury:* types of cell injury, etiology of cell injury, morphology of cell injury, cellular swelling.
- *Cell Death:* types- Autolysis, Necrosis, Apoptosis & Gangrene.
- *Cellular Adaptations*: Atrophy, Hypertrophy, Hyperplasia & Dysplasia.

UNIT-III: Inflammation (3 Lectures)

- Acute inflammation - vascular event, cellular event, inflammatory cells.
- Chronic Inflammation - general features

UNIT-IV: Hemodynamic Disorders (3 Lectures)

- Edema, hyperemia, congestion, hemorrhage, thrombosis, ischemia & infarction.

UNIT-V: Neoplasia (2 Lectures)

- Definition,difference between benign tumor and malignant tumor.

UNIT-VI: Healing (2 Lectures)

- Definition, different phases of healing, factors influencing wound healing.

CONCEPTUAL MICROBIOLOGY & PATHOLOGY (PRACTICAL)
Course Code: MIC/PAT.102P
Credit Hours: 1.5

Microbiology

- Handling and maintenance of instruments required for routine lab work.
- *Various staining Techniques:* Gram stain, Acid-fast stain, Negative stain, Albert Stain.
- Various culture techniques
- Demonstration of Sterilization methods
- Preparation of commonly used culture media: Nutrient agar, Blood/chocolate agar, MacConkey agar, Sabouraud dextrose agar.

Pathology

- Components & setting of the Compound microscope.
- Focusing of object.
- Use of low & high power objectives of microscope.
- Use of oil immersion lens.
- Care and Maintenance of the microscope.
- Different types microscopy

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

CONCEPTUAL BIOCHEMISTRY (THEORY)
Course Code: BIO.103T
Credit Hours: 2
Semester: I

UNIT -I: Introduction to Biochemistry (2 Lectures)

- Important definitions (Diffusion, Osmosis, Surface Tension, Adsorption , Absorption) & scope of biochemistry

UNIT -II: Carbohydrate (3 Lectures)

- Classification with structures
- Importance of Carbohydrates

UNIT -III: Lipids (3 Lectures)

- Classification
- Importance of Lipids

UNIT -IV: Proteins (4 Lectures)

- Amino Acid: Classification and general Properties
- Importance of Proteins
- Classification of Protein (in brief)

UNIT -V: Nucleotides (4 Lectures)

- Nucleoside & Nucleotide
- General structures of Purine and pyrimidine
- Brief discussion of DNA & RNA
- Structure of DNA

UNIT -VI: Electrolytes (3 Lectures)

- Source, function & deficiency symptoms of Sodium, Potassium, Calcium, phosphorus, Iron, Zinc & Chloride in human body.

UNIT - VII: Analytical Chemistry (5 Lectures)

Concepts of : Percent, Morality, Molality, Normality

- *SI Units:* Deci, Centi, Milli, Micro, Nano, Pico, Kilo, Mega, Giga & Angstrom
- **Normal Values & Interpretations:**
  - *Electrolytes:* Sodium, Potassium, Calcium, Iron, Chloride
  - *Renal Function Test*: Urea, Creatinine, Uric Acid, Glucose
  - *Urine Analysis:* Composition, Colour, Volume, pH, Specific Gravity, Turbidity
  - *Liver Function Test :* SGOT, SGPT, Bilirubin, Albumin, Globulin & Alkaline Phosphatase
  - *Carbohydrates:* Fasting , Random, GTT
  - *Lipid Profile :* Cholesterol, Triglycerides, HDL,LDL, VLDL

UNIT -VIII: Acids & Bases (2 Lectures)

- Definition, Classification of acids and bases.
- Physical and chemical properties with examples.
- Arrhenius concept of acids and bases.
- Classification of acids and bases.
- pH, Buffer Solutions

CONCEPTUAL BIOCHEMISTRY (PRACTICAL)
Course Code: BIO.103P
Credit Hours: 1.5

- Preparation of common lab reagents.
- General description of equipment's used in Biochemistry Lab.
- *Working & Uses of:* Spectrophotometer, Water bath, Centrifuges, Analytical Balances, pH meter, Colorimeter.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

HUMAN VALUES & PROFESSIONAL ETHICS
Course Code: PMS.104T
Credit Hours: 2
Semester : I

UNIT-I: Need, Basic Guidelines, Content and Process for Value Education (10 Lectures)

- Understanding the need, basic guidelines, content and process for Value Education
- Self Exploration–what is it? - its content and process; 'Natural Acceptance' and Experiential Validation- as the mechanism for self exploration
- Continuous Happiness and Prosperity- A look at basic Human Aspirations
- Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority
- Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
- Method to fulfill the above human aspirations: understanding and living in harmony at various levels

UNIT-II: Understanding Harmony in the Human Being - Harmony in Myself! (10 Lectures)

- Understanding human being as a co-existence of the sentient 'I' and the material 'Body'
- Understanding the needs of Self ('I') and 'Body' - Sukh and Suvidha
- Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)
- Understanding the characteristics and activities of 'I' and harmony in 'I'
- Understanding the harmony of I with the Body: Sanyam and Swasthya; correct appraisal of Physical needs, meaning of Prosperity in detail
- Programs to ensure Sanyam and Swasthya - Practice Exercises and Case Studies will be taken up in Practice Sessions.

UNIT-III: Understanding Harmony in the Family and Society (10 Lectures)

- Understanding harmony in the Family- the basic unit of human interaction
- Understanding values in human-human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti; Trust (Vishwas) and Respect (Samman) as the foundational values of relationship

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

INTRODUCTION TO CATH LAB & CATH LAB MAINTENANCE (THEORY)

Course Code: CAT.105T

Credit Hours: 3

Semester: I

Section-I: Introduction to Cath Lab (40 Lectures)

- Identification and use of resuscitation equipments available on trolley. (Ambu bag, endotracheal tubes size, tracheostomy tray) .
- Description and working of machines and appliances like airway, endotracheal tubes, laryngoscopes, cath lab, ventilators, C arm, cardiac table.
- Their component parts, cleaning, sterilization, care, maintenance, assembly and dismantling.
- Drugs in cathlab- premedication (oxygen, Glycopyrrolate, atropine, ondansetron, ranitidine, midazolam, pentazocine, fentanyl, diclofenac), IV beta blockers, heparin, angiography dyes,
- Types of anaesthesia. (Local, sedation, epidural, general, regional blocks)
- Local anaesthetics (Lignocaine, Bupivacaine)
- Pre Procedure evaluation, consent for procedure, Preparation, position of patient, required drugs, doses, side effects.
- Epidural anaesthesia- Preparation, position of patient, required drugs, doses, side effects.
- Lay out of trolley for all types of cath lab procedures.
- Use of cathlab table and C arm,
- O_2 cylinders, Central gas pipeline, Manifold system, Liquid O_2,
- Central suction, electrical, foot suction.
- Explosion risks. Fire-fighting.
- Maintenance of cath lab equipments, records and charts.
- Pre procedure protocols
- Post procedure care.
- Recording video of procedure and labelling of procedure done, taking print outs and dictation of cardiologist, To prepare CD of procedure.
- Legal aspects
- Consent
- Communicating with patients and relatives

Section-II: Cath Lab Maintenance (20 Lectures)

- Cleanliness and sterilization of cath lab. Lighting facility.
- Helping cardiologists and others to wash up and drape for operation.
- Handling of sterilized articles.
- Washing, cleaning, testing recyclable disposables and preparing them for sterilization and packing.
- Identification use, care, maintenance and sterilisation of common types of instruments, needles, stents, guide wires, balloons used in cath-lab
- Lay out of instruments trolley,

- Procedures like angiography, angioplasty, balloon dilatation of valves, pacemakers (temporary, permanent), device closures.
- Application of bandages, dressings, tourniquets.
- Reception and preparation of patients for cath lab, removing sheath
- Observation of patients during operation, post operative period, recording pulse and BP, urine output, ECG recording,
- Attaching patient to multi para monitor
- Universal safety precautions
- Operating C-arm

INTRODUCTION TO CATH LAB & CATH LAB MAINTENANCE (PRACTICAL)
Course Code: CAT.105P
Credit Hours: 1.5

- Demonstration of various Cath Lab equipments as per theory syllabus.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

ENGLISH FOR PROFESSIONALS
Course Code: PMS.106T
Credit Hours: 2
Semester: I

UNIT-I: Grammar (10 Lectures)

- Narration.
- Voice change (Use of passive voice particularly in scientific and official writing).
- Use of articles and preposition.
- The language of Doctor and Patient.
- General description and Medical description.
- Medical terminology – roots.
- Prefixes and suffixes.
- Medical abbreviations.
- Punctuation
- Common errors in English.

UNIT-II: Writing Skills (10 Lectures)

- Precis writing.
- Report writing (with special stress on scientific/technical reports, preparing field/observation report).
- Letter writing/application writing (Social, business letter, applying for a job, for higher studies, Preparing curriculum vitae, subscribing to a journal, letters to the Editor).
- Essay writing

UNIT-III: Spoken English (10 Lectures)

- Advertisements/Posters
- Telegrams & short post cards
- Note & notice
- Front Desk management, Fixing appointments, getting information – Managing medical representatives, able to answer FAQs, lab reports writing, telephoning in a hospital: the object is to practice influent conversation.

SCHEME OF EXAMINATION

Type of Questions	Total No. of Questions	No. of Questions to be attempted	Marks (Each Question)	Subtotal
SEC -A (Grammar)	25	20	1	20
SEC -B (Essay writing)	3	1	10	10
SEC-C(Precis writing)	1	1	5	10
SEC-D(Letter writing)	2	1	5	10
			TOTAL MARKS	**50**

COMMUNICATION AND SOFT SKILLS
Course Code: PMS.107T
Credit Hours: 2
Semester: I

UNIT-I: Introduction to Communication **(5 Lectures)**

- Purpose of Communication
- Process of Communication
- Importance of Communication in Business
- Barriers to Communication
- Measures to Overcome the Barriers to Communication.

UNIT-II: Types of Communication **(5 Lectures)**

- Verbal Communication: Importance of verbal communication and Advantages of verbal communication
- Non Verbal Communication: Importance of written communication and Significance of Non-verbal Communication

UNIT-III: Communication Network **(5 Lectures)**

- Scope and Types of Communication Network
- Formal and Informal Communication Network
- Upward Communication
- Downward Communication
- Horizontal Communication
- Diagonal Communication.

UNIT-IV: Letter and Resume Writing **(5 Lectures)**

- Types of Letter – Formal/Informal
- Importance and function of Letter Writing
- Business Letters / Elements of Structure
- Resume and Covering Letter
- Guidelines for making a Result – Oriented Resume/ Helpful Hints

UNIT-IV: Interview preparation **(5 Lectures)**

- Types of Interview
- Preparing for an Interview
- Attending an Interview
- Employers Expectation
- General Etiquette

UNIT-IV: Group Discussion and Presentation **(5 Lectures)**

- Process of Group Discussion
- Guidelines
- Helpful Expressions
- Evaluation

UNIT-VI: Presentation Skills **(5 Lectures)**

- Importance of Presentation skills
- Organizing Contents/ Structural Elements of a Presentation Concerning Data
- Visual Aids and Voice & Picture Integration
- Guidelines to make Presentation Interesting
- Body Language

(Note: Every student shall be given 15 minutes of presentation time)

SCHEME OF EXAMINATION

Type of Questions	Total No. of Questions	No. of Questions to be attempted	Marks (Each Question)	Subtotal
SEC -A (Fill ups)	10	10	1	10
SEC -B (Short Essay)	6	5	4	20
SEC-C (Long Essay)	3	2	5	10
SEC-D (Letter writing)	2	1	10	10
			TOTAL MARKS	**50**

ENVIRONMENTAL STUDIES
Course Code: PMS.108T
Credit Hours: 2
Semester: II

UNIT-I : Natural Resources (10 Lectures)

- *Renewable and non-renewable resources :*Natural resources and associated problems.
- *Forest resources :* Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people.
- *Water resources :* Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
- *Mineral resources :* Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
- *Food resources :* World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
- *Energy resources:* Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies.
- *Land resources:* Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

UNIT-II : Ecosystems (4 Lectures)

- Concept of ecosystems, Structure and function of an ecosystem.
- Producers, consumers and decomposers.
- Energy flow in the ecosystem.
- Ecological succession.
- Food chains, food webs and ecological pyramids.
- *Introduction, types, characteristic features, structure and function of the following ecosystem:* Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT-III: Biodiversity and its Conservation (3 Lectures)

- Introduction – Definition: genetic, species and ecosystem diversity.
- *Threats to biodiversity:* habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India
- *Conservation of biodiversity:* In-situ and Ex-situ conservation of biodiversity.

UNIT-IV: Environmental Pollution (7 Lectures)

- *Definition, Cause, effects and control measures of :* Air pollution, Water pollution, Soil pollution, Noise pollution, Thermal pollution
- Role of an individual in prevention of pollution.
- *Disaster management:* floods, earthquake, cyclone and landslides.

UNIT-V : Social Issues and the Environment (4 Lectures)

- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust

- *ACTS:* Environment Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act

UNIT-VI : Human Population and the Environment (2 Lectures)

- Population explosion – Family Welfare Programme.
- Human Rights & Value Education.
- Women and Child Welfare.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

ANATOMY & PHYSIOLOGY OF CARDIOVASCULAR SYSTEM (THEORY)
Course Code: ANA/PHY.109T
Credit Hours: 4
Semester: II

Section-I: Anatomy of CVS (10 Lectures)

- Right atrium structural features, venous area, septum and appendage.
- Left atrium structural features venous area, septum and appendage.
- Right ventricle structural features inflow and outflow characteristics.
- Left ventricle structural features inflow and outflow characteristics.
- Valves location, structure and functions of each valve.
- Innovation: Sympathetic and parasympathetic sensory.
- Mediastinum and its divisions
- Great vessels
- Major Arteries and their branches
- Major veins and their tributaries
- Cross sectional Anatomy of Heart

Section-II: Physiology of CVS (40 Lectures)

- Introduction to CVS physiology
- Functions of CVS and blood circulation. Tissue perfusion and microcirculation
- Cardiac output definition, measurements, regulation and control
- Stroke volume, Arterial pressure and its regulation
- Peripheral resistance, Venous return, Heart rate
- Cardiac cycle with special reference to waveforms of pressure tracing
- Heart as a pump physical characteristics of atria, ventricles and valves
- Mechanism of contraction
- Description and organization of pacemaker and conduction system
- Specialized conduction tissues, Sinus node, Inter nodal tracts
- Atrioventricular node, His bundle, Bundle branches
- Nodal electricity
- Nervous control of heart rate
- Cardiovascular regulatory mechanism.
- Vasodilation, Auto regulation (myogenic theory)
- Physics of ventilation- principles of elasticity compliance and airway resistance.
- Baro and chemo receptors
- Mechanism and regulation of respiration, Principles of gaseous exchange
- Pulmonary function studies, lung volumes and capacities by use of spirometry
- Brief concept of artificial ventilation

- Components of blood-their normal values and function
- Blood groups and briefly procedures involved in blood transfusion
- Briefly coagulation factors and coagulation cascade
- Renal function tests
- Routine biochemical investigations
- Cardiac profiles – biochemical markers of myocardial infarction, basic principles, evaluation and application
- Basic principles and estimation blood gas and PH
- Basic principles and estimation of electrolytes

ANATOMY & PHYSIOLOGY OF CARDIOVASCULAR SYSTEM (PRACTICAL)
Course Code: ANA/PHY.109P
Credit Hours: 2

- Conducted as per theory syllabus.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	**Marks**
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

CARDIAC INTENSIVE CARE & EMERGENCIES (THEORY)
Course Code: CAT.110T
Credit Hours: 3
Semester: II

- Introduction to intensive cardiac care **(6 Lectures)**
- Monitoring in intensive care – non invasive & invasive **(6 Lectures)**
- Acute coronary syndrome including clinical presentation & principles of management **(8 Lect.)**
- Cardiac failure (Clinical Presentations & principles of management) **(8 Lectures)**
- Drugs in intensive care unit including thrombolytics (formulations, administration & adverse effects) **(10 Lectures)**
- Cardiac arrhythmias (Clinical Presentations & principle of management) **(6 Lectures)**
- Circulatory and ventilatory assistance in intensive care **(6 Lectures)**
-

CARDIAC INTENSIVE CARE & EMERGENCIES (PRACTICAL)
Course Code: CAT.110P
Credit Hours: 1.5

- Conducted as per theory syllabus.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	**Marks**
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

CARDIAC DISEASES & PRINCIPLES OF INVASIVE MANAGEMENT (THEORY)
Course Code: CAT.111T
Credit Hours: 3
Semester: II

- Introduction to invasive cardiology & cardiac catheterization **(3 Lectures)**
- Radiation safety **(2 Lectures)**
- Coronary angiography **(6 Lectures)**
- Coronary angioplasty **(6 Lectures)**
- Pacemaker implantation **(6 Lectures)**
- Balloon valvotomy **(6 Lectures)**
- Paediatric catheterisation and interventions **(6 Lectures)**
- Pericardiocentesis **(5 Lectures)**
- Complications of cardiac intervention and their management **(5 Lectures)**
- Principles of electro physiological studies and ablation **(5 Lectures)**

CARDIAC DISEASES & PRINCIPLES OF INVASIVE MANAGEMENT (PRACTICAL)
Course Code: CAT.111P
Credit Hours: 1.5

- Demonstration of various techniques as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1^{st} ,2^{nd} Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

MEDICINE RELEVANT TO CARDIAC CARE TECHNOLOGY (THEORY)
Course Code: MED.112T
Credit Hours: 4
Semester: II

Definition, symptoms, complications, diagnosis , treatment and prevention:

UNIT-I: Cardiovascular System (15 Lectures)

- Ischaemic heart diseases
- Rheumatic heart disease
- Congenital heart diseases
- Hypertension
- Aortic Aneurysms
- Cardiomyopathy
- Peripheral vascular disease
- Pulmonary edema
- Heart failure & its types

UNIT-II: Hematology (8 Lectures)

- Anaemia
- Bleeding disorders

UNIT-III: Respiratory System (8 Lectures)

- Chronic obstructive airway diseases (COPD)-Diagnosis & management

UNIT-IV: Renal System (6 Lectures)

- Acute & chronic renal failure-End stage renal disease
- Role of dialysis and renal transplantation in its management

UNIT-V: Central Nervous System (6 Lectures)

- Brief mention of CNS disorders

UNIT-VI: Others (7 Lectures)

- Diabetes mellitus
- Obesity- BMI

MEDICINE RELEVANT TO CARDIAC CARE TECHNOLOGY (PRACTICAL)
Course Code: MED.112P
Credit Hours: 2

- Conducted as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	**Marks**
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1^{st} ,2^{nd} Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

BIOSTATISTICS & COMPUTER APPLICATIONS
Course Code: PMS.201T
Credit Hours: 2
Semester: III

SECTION-I: BIOSTATISTICS (15 Lectures)

- Introduction to data and statistics
- Presentation of data:
  - Bar diagram
  - Histogram
  - Frequency polygon
  - Frequency curve, Cumulative frequency curve.
- Measure of central tendency:
  - Mean
  - Median
  - mode (individual, discrete and continuous data).
- Measure of variability:
  - Range
  - Standard deviation
  - Variance and coefficient of variation

SECTION-II: COMPUTER APPLICATIONS (15 Lectures)

- Computer: General Introduction, History of computer development and respective generation: Need to use computers, Applications in Laboratory and in general.
- Input and Output Device
- Memory
- Personal Computer
- Data Representation and Number System
- Software
- Data Communication
- Internet, Cyber etiquette
- Microsoft Office: PowerPoint Presentations, Microsoft word, excel sheet
-

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

PATHOLOGY & MICROBIOLOGY OF DISEASES PERTINENT TO CARDIAC TECHNOLOGY (THEORY)
Course Code: PAT/MIC.202T
Credit Hours: 4
Semester: III

Outline of clinical presentation and management of following conditions

UNIT-I: Valvular Heart Disease **(12 Lectures)**

- Etiology
- Acquired valvular heart disease
- Rheumatic fever and rheumatic heart disease
- Aortic stenosis
- Aortic regurgitation
- Mitral valve disease
- Mitral stenosis
- Mitral regulation
- Mitral valve disease
- Tricuspid valve desease
- Infective endocarditis
- Valvuloplasty and valve surgery

UNIT-II: Coronary Artery Disease **(8 Lectures)**

- Pathophysiology and clinical recognition
- Angina Pectoris
- Synptomatic and asymptomatic myocardial ischemis
- Types and locations of myocardial infarction
- Thrombolytic therapy
- Medical treatment
- Percutaneous interventions
- Surgical treatment
- Cardiac rehabilitation

UNIT-III: Systemic Hypertension **(2 Lectures)**

- Essential and secondary hypertension

UNIT-IV: Heart Failure **(2 Lectures)**

- Surgical and medical treatment

UNIT-V: Myocardial Diseases **(5 Lectures)**

- Dilated cardiomyopathy
- Hypertrophic cardiomyopathy
- Restrictive cardiomyopathy
- Myocarditis

UNIT-VI: Pericardial Diseases **(5 Lectures)**

- Pericsaridial effusion
- Constrictive pericarditis
- Cardoac tamponade

UNIT-VII: Electrical Disturbances of the Heart **(4 Lectures)**

- Sinus node dysfunction
- Arrhythmias and Conduction Disturbances
- Treatment of arrhythmias – pharmacological, radiofrequency ablation and surgery

UNIT-VIII: Pulmonary Hypertension **(4 Lectures)**

- Primary pulmonary hypertension
- Pulmonary thromboembolism

UNIT-IX: Peripheral Vascular Disease **(6 Lectures)**

- Atherosclerotic peripheral vascular disease
- Aortic aneurysms
- Aortic dissection
- Takayasu arteritis

UNIT-X: Congenital Heart Disease **(12 Lectures)**

(a) Acyanotic heart disease

- Atrial septal defect
- Ventricular septal defect
- Patent ductus arteriosus
- Congenital valvular disease
- Coarctation of aorta

(b) Cyanotic vongenital heart disease

- Tetralogy of Fallot
- Double outlet right ventricle
- Pulmonary atresia
- Transposition of great arteries
- Truncus arteriousus
- Total anomalous pulmonary venous connection

PATHOLOGY & MICROBIOLOGY OF DISEASES PERTINENT TO CARDIAC TECHNOLOGY (PRACTICAL)
Course Code: PAT/MIC.202P
Credit Hours: 2

- Conducted as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

INVESTIGATIONS & EQUIPMENTS IN INVASIVE CARDIOLOGY (THEORY)
Course Code: CAT.203T
Credit Hours: 4
Semester: III

- Pre catheterisation assessment **(5 Lectures)**
- Post catheterisation care and assessment **(5 Lectures)**
- Sterilization procedures (including autoclave, ETO, fumigation) **(5 Lectures)**
- Catheterisation laboratory infrastructure and equipments **(10 Lectures)**
- Hardware used in Catheterisation laboratory (including catheters, wires, leads, devices, balloon, stents etc) **(15 Lectures)**
- Radio opaque contrast **(5 Lectures)**
- Drug used in invasive cardiology (antiplatlets, anticoagulant, GpIIbIIIa inhibitors etc.) **(10 Lectures)**
- Introduction to cardio vascular surgery **(5 Lectures)**

INVESTIGATIONS & EQUIPMENTS IN INVASIVE CARDIOLOGY (PRACTICAL)
Course Code: CAT.203P
Credit Hours: 2

- Conducted as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

MEDICAL ELECTRONICS, BIOPHYSICS & COMPUTER USES IN CARDIAC TECHNOLOGY (THEORY)
Course Code: CAT.204T
Credit Hours: 3
Semester: III

- Introduction to medical physics **(2 Lectures)**
- Blood pressure recording **(2 Lectures)**
- Pressure transducers **(4 Lectures)**
- Defibrillators **(4 Lectures)**
- Cathode ray tubes and physiological monitors **(4 Lectures)**
- Impedence plethysmography **(4 Lectures)**
- Pulse oximetry **(5 Lectures)**
- Medical ultrasound and Doppler **(5 Lectures)**
- Ionic currents and Electrocardiography **(4 Lectures)**
- Electrocardiographic processing and display system **(4 Lectures)**
- Radiation physics **(3 Lectures)**
- Techniques of monitoring radiation exposure **(4 Lectures)**
- Measures to reduce radiation exposure **(3 Lectures)**
- Computer use in medical care and data entry **(2 Lectures)**

MEDICAL ELECTRONICS, BIOPHYSICS & COMPUTER USES IN CARDIAC TECHNOLOGY (PRACTICAL)
Course Code: CAT.204P
Credit Hours: 1.5

- Demonstration of various techniques/procedures as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

BASIC ELECTROCARDIOGRAPHY (ECG) (THEORY)
Course Code: CAT.205T
Credit Hours: 3
Semester: III

- Fundamental principles of electrocardiography
- Cardiac electrical field generation during activation
- Cardiac wave fronts
- Cardiac electrical field generation during ventricular recovery
- Electrocardiographic lead systems
- Standard limb leads
- Precordial leads and the Wisdom central termina
- Augmented limb leads
- The hexaxial reference frame and electrical axis
- Recording adult and pediatric ECGs
- The normal electrocardiogram
- Atrial activation
- The normal P wave
- Artial repolarization
- Atrioventricular node conduction and the PR segment
- Ventricular activation and the QRS complex
- Ventricular recovery and ST-T wave
- U wave
- Normal variants
- Rate and rhythm
- ECG Machines: Functions, Frequency Response, Recording, Speed, Sensitivity, Standardisation, Stylus Lag (Heat Stylus)
- ECG and Chamber Hypertrophy
- ECG and Arrhythmia
- ECG in Myocardial Infarction, Myocardial Ischemia
- ECG in Miscellaneous Conditions: Metabolic, electrolyte changes
- ECG for Technician: Summary

BASIC ELECTROCARDIOGRAPHY (ECG) (PRACTICAL)
Course Code: CAT.205P
Credit Hours: 1.5

- Demonstration of various tests/techniques as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	**Marks**
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

CARDIAC CARE TECHNOLOGY - CLINICAL (THEORY)
Course Code: CAT.206T
Credit Hours: 4
Semester: IV

- Interpretation of Normal ECG and Basic abnormalities of ECG in RHD, IHD & CHD
- Echo in rheumatic heart disease – Echo in mitral stenosis, mitral incompetence, aortic stenosis, aortic incompetence, pulmonary hypertension. Post AVR, post MVR. Prosthetic valve malfunction, LA clot.
- Echo in congenital heart disease – Echo in ASD, VSD, PDA pulmonary stenosis, aortic stenosis, coarctation of aorta, TOF. Dextrocardia.
- Echo in ischemic heart disease – Echo in acute myocardial infarction, old myocardial infarction and other ischemic heart disease related conditions, LV aneurysm.
- Echo in other cardiovascular disease- Echo in various types of cardio myopathy infective endocardities diseases of aorta, mitral valve prolapse, myxoma and other cardio vascular diseases.
- Assessment of Cardiac function- measurements of all cardiac chambers and assessment of cardiac function.
- Echo in pericardial disease- pericardial effusion, cardiac temponade, constructive pericarditis.
- Cardiac catheterization laboratory – general details of cardiac catheterization equipment, how to handle the machine, common problems one may come across and how to overcome it, radiation hazards.
- Materials used in the cath lab- all catheters, balloons, guide wires, pacemakers contrast material and other material used in the cardiac catheterization laboratory an sterilization of all these materials.
- Right heart catheterization – procedure, cath position, oxymetry at various levels, angios done and its interpretation.
- Left heart catheterization – procedure, cath position, oxymetry at various levels, angios done and its interpretation.
- Coronary angiogram – procedure, materials used, type and amount dye used, indications and contraindications, various pictures recorded in various angles and gross interpretation.
- Peripheral angiogram – procedure, indication and contraindication.

CARDIAC CARE TECHNOLOGY - CLINICAL (PRACTICAL)
Course Code: CAT.206P
Credit Hours: 2

- Conducted as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1^{st} ,2^{nd} Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

ADVANCED ELECTROCARDIOGRAPHY (ECG) (THEORY)
Course Code: CAT.207T
Credit Hours: 4
Semester: IV

- The abnormal electrocardiogram
- Left atrial abnormality
- Right atrial abnormality
- Left ventricular hypertrophy and enlargement
- Right ventricular hypertrophy and enlargement
- Intraventricular conduction delays
- Left anterior fascicular block
- Left posterior fascicular block
- Left bundle branch block
- Right bundle branch block
- Myocardial ischemia and infarction
- Repolarization (ST-T wave) abnormalities
- QRS changes
- Evolution of electrocardiographic changes
- Localization of ischemia or infarction
- Non-infarction Q waves
- Primary and secondary T wave change
- Electrolyte and metabolic ECG abnormalities
- Cardiac arrhythmias
- Ventricular premature beats
- Supra-ventricular tachycardia’s
- Atrial flutter/fibrillation
- Ventricular Tachycardia/Ventricular fibrillation
- Atrio Ventricular block
- Prolonged PR interval
- Mobitz type 1 and 2 block
- Complete heart block
- Direct Current (DC) shock
- Defibrillator
- Monophasic and biphasic shock
- Technique of cardioversion
- Indications for cardioverion

ADVANCED ELECTROCARDIOGRAPHY (ECG) (PRACTICAL)
Course Code: CAT.207P
Credit Hours: 2

- Demonstration of various techniques as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

CARDIAC CATHETERIZATION -I (THEORY)
Course Code: CAT.208T
Credit Hours: 3
Semester: IV

- Cardiac Catheterization: Laboratory Setup / Types of Procedures
- Type of catheters ,Catheter cleaning and packing
- Techniques of sterilization-advantages and disadvantages of each Setting up the cardiac catheterization laboratory for a diagnostic study
- Sterile Techniques in Cath Lab / Sterile Areas, Sterile Procedure, sterile trolley setting, Scrubbing, gowns and
- Gloves, scrubbing and draping Patients, handling sterile disposables etc.
- Sterilisation and re-use of hardware
- Cath-Lab Equipments: Defibrillator / Pacemaker / IABP / BOYLE's, Apparatus / Suction Machine/oxygen Infusion Pumps / Programmed Stimulators, Pacing System Analysers
- Hemodynamic Recorders (Physiological Records)
- Transducers
- Recording of Pressure Wave Form: Range / Gain / Speed / Systolic / Diastolic And Mean Pressures in Chambers and Vessels
- Hazard Management
- Radiation Protection
- Infection Prevention
- Injury Prevention: Electrical /Mechanical
- Wastes Management: Plastics, Biological Wastes, Glass / Needle / Syringes
- Technician's Role
- Patient monitoring
- Procedure Related : Data collection, Acquisition and entry of Data, Procedure Books,Log Books, Registers etc.
- Stock of all disposables Eg: Catheters etc.
- Stores (Disposable Items)
- Accounting (Used Items)
- Equipment Maintenance
- Cine Angiography: Cine Filming, Cine Film Processing and Cine Film Viewing , cine film library
- Contrast Media

CARDIAC CATHETERIZATION -I (PRACTICAL)
Course Code: CAT.208P
Credit Hours: 1.5

- Demonstration of various procedures as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	**Marks**
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

INVESTIGATIONS & EQUIPMENTS IN NON-INVASIVE CARDIOLOGY (THEORY)
Course Code: CAT.209T
Credit Hours: 3
Semester: IV

- Electrocardiography **(10 Lectures)**
- Stress testing **(5 Lectures)**
- Echocardiography **(10 Lectures)**
- Radiology of heart and Blood vessels **(5 Lectures)**
- Cardiac CT, Cardiac MRI, CT/ MR angiography **(10 Lectures)**
- Nuclear Cardiology **(5 Lectures)**
- Defibrillator **(5 Lectures)**

INVESTIGATIONS & EQUIPMENTS IN NON-INVASIVE CARDIOLOGY (PRACTICAL)
Course Code: CAT.209P
Credit Hours: 1.5

- Conducted as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1^{st} ,2^{nd} Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

COMMUNITY HEALTH
Course Code: PMS.210T
Credit Hours: 2
Semester: IV

- General concepts of health and diseases with reference to natural history of disease with pre-pathogenic and pathogenic phase. The role of socio-economic and cultural environment in health and diseases-Epidemiology and scope. **(3 Lectures)**
- Public health administration-An overall view of the health Administration set up at centre and state level. **(3 Lectures)**
- The National Health Programmes- National Health programmes including tuberculosis, malaria, MCH and HIV/AIDS. **(3 Lectures)**
- Health problems in vulnerable groups-Pregnant and lactating women and infants and school going children-occupational groups, geriatrics. **(3 Lectures)**
- Occupational Health- Definition, scope-Occupational diseases, prevention of occupational diseases and hazards. **(3 Lectures)**
- Social security and other measures for the protection of occupational hazards, accidents and disease. Details of compensation acts. **(3 Lectures)**
- Family planning objectives of National family planning methods. A general idea of advantages and disadvantages of the method. **(3 Lectures)**
- Mental Health- community aspects of mental health; role of physiotherapists, therapists in mental health problems such as mental retardation etc. **(3 Lectures)**
- Communicable disease-An overall view of the communicable disease. Classification according to the principal mode of transmission. Role of insects and their vectors. **(3 Lectures)**
- International health agencies. **(3 Lectures)**

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

NUTRITION
Course Code: PMS.211T
Credit Hours: 2
Semester: IV

- Introduction to science of nutrition
- Food pattern and its relation to health **(2 Lectures)**
- Factors influencing food habits, selection and food stuffs **(3 Lectures)**
- Food selection, storage & preservation **(3 Lectures)**
- Classification of nutrients – macronutrients and micronutrients **(3 Lectures)**
- Proteins – types, sources requirements and deficiencies of proteins **(3 Lectures)**
- Carbohydrates sources, requirements & efficiency **(3 Lectures)**
- Fats – types, sources, requirements, deficiency and excess of fats **(3 Lectures)**
- Water – sources of drinking water, requirements, preservation of water **(2 Lectures)**
- Minerals – types, sources, requirements deficiencies of minerals **(3 Lectures)**
- Vitamins – types, sources, requirements deficiencies of vitamins **(3 Lectures)**
- Planning diets including renal diets **(2 Lectures)**

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

OCCUPATIONAL SAFETY & HEALTH
Course Code: PMS.212T
Credit Hours: 2
Semester: IV

UNIT - I : Safety and Health Management (4 Lectures)

i. Occupational Health Hazards, Promoting Safety, Safety and Health training, Stress and Safety.

ii. Ergonomics - Introduction, Definition, Objectives, Advantages.

Ergonomics Hazards - Musculoskeletal Disorders and Cumulative Trauma Disorders.

- Organizing for safety, Health and Environment.
- Organization: Structure, Function and responsibilities
- Safety Committee: Structure and function

UNIT - II : Radiation and Industrial Hazards (5 Lectures)

i. Types and effects of radiation on human body, Measurement and detection of radiation intensity. Effects of radiation on human body, Measurement – disposal of radioactive waste, Control of radiation

ii. Industrial noise -Sources, and its control, Effects of noise on the auditory system and health, Measurement of noise ,

iii. Different air pollutants in industries, Effect of different gases and particulate matter ,acid fumes , smoke, fog on human health

iv. Vibration - effects, measurement and control measures

v. Industrial Hygiene.

UNIT –III: Electrical Hazards (5 Lectures)

Safe limits of amperages, voltages, distance from lines, etc., Joints and connections, Overload and Short circuit protection, Earthing standards and earth fault protection , Protection against voltage fluctuations, Effects of shock on human body Hazards from Borrowed nutrals, Electrical equipment in hazardous atmosphere, Criteria in their selection, installation, maintenance and use, Control of hazards due to static electricity,

UNIT – IV: Fire and Other Hazards (3 Lectures)

i. General causes and classification of fire, Detection of fire, extinguishing methods, fire fighting installations with and without water.

ii. Machine guards and its types, automation. High pressure hazards, safety, emptying, inspecting, repairing, hydraulic and nondestructive testing, hazards and control in mines.

UNIT –V: Vibration and Noise (3 Lectures)

Activities related to vibrations, its impact on human health, abatement Sources, effects of noise on man, Measurement and evaluation of noise, Silencers, Practical aspects of control of noise

UNIT-VI: Theories & Principles of Accident Causation & Prevention (5 Lectures)

i. The effect of accident, unsafe act, unsafe condition, unpredictable performance, Human factors contributing to accidents - causes for unsafe acts,

ii. Safety and psychology -Theories of motivation and their application to safety. Consequences of accident, accident prevention programmers, Role of safety

Incident, accident, injury, dangerous occurrences, unsafe acts, unsafe conditions, hazards, error, oversight, mistakes, etc.

Accident Prevention: Theories / Models of accident occurrences, Principles of accident prevention, Accident and Financial implications.

UNIT-VII: First Aid (5 Lectures)

i. Body structure and Functions, Position of causality, the unconscious casualty, fracture and dislocation, Injuries in muscles and joints, Bleeding, Burns, Scalds and accidents caused by electricity, Respiratory problems, Rescue and Transport of Casualty. Cardiac massage, poisoning, wounds.

ii. Personal Protective Equipments: Need, selection, supply, use, care and maintenance, Personal protective devices for head, ear, face, eye, foot, knee and body protection, Respiratory personal protective devices.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

CARDIAC CATHETERIZATION-II (THEORY)
Course Code: CAT.301T
Credit Hours: 3
Semester: V

- Cardiac Catheterization Procedure: Diagnostic Studies
- Cardiac Catheterization Procedure: Therapeutic / Interventional Procedures
- Acquisition of Cath Data : Cardiac Output / Oximetry and Shunts
- Acquisition of Cath Data: Pressures and Wave Forms; Recording Technique, Analysis
- Angiography: Technique / Views / Contrast Media
- Cardiac Catheterization
- Hardware :Catheters / Connections / Sheaths /Stopcocks / Wires / Angioplasty Catheters
- Complication of Cardiac Catheterization: Recognition and management
- Cardiopulmonary Resuscitation
- *Special Procedures:* Pericardial Tap, Atrial Septostomy, Endomyocardial Biopsy, Balloon Angioplasty (Valve),Coronary Angioplasty
- Case Study of Simple Cardiac Disease- ASD, MS, Tetralogy of Fallot
- Hardware Of Cardiac Catheterization and Interventions
- Venous and Arterial Check Flow Sheaths, Manifolds,3-Way Stock Cocks etc.
- Guide Wires and Dilators
- Puncture Needles (Vascular Access Needles)
- *Woven Dacron Catheters:* GL, NIH, Lehman, Woven Dacron Electrode Catheters
- Flow Directed Catheters (Swan Ganz Type) Balloon Angio Catheters
- *Polyurethane Catheters:* Pig Tail, Judkins, Coronary, Amplatz Coronary, Brachial Coronary, Sones Catheters.
- *Guide Wires:* Short, Normal Length, Exchange Length 'J' Tipped Movable Core, Tips, Deflectable Types.
- Valvuloplasty Catheters, Atrial Septostomy Catheters.
- Coronary Angioplasty: Guide Catheters, Guide Wire,Balloon Dilatation Catheters, Indiflators, Y Connectors
- Stents: Bare Stents, Mounted Stents, Other types of Stents

CARDIAC CATHETERIZATION-II (PRACTICAL)
Course Code: CAT.301P
Credit Hours: 1.5

- Conducted as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	**Marks**
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

PHARMACOLOGY RELEVANT TO CARDIAC TECHNOLOGY (THEORY)
Course Code: PHR.302T
Credit Hours: 3
Semester: V

Route of administration, types of formulations, dose and frequency of administration, side effects and toxicity, management of toxic effect, drug interaction, knowledge of chemical and trade names, importance of manufacture and expiry dates and instructions about handling each drug.

UNIT-I: Anti-Anginal Agents (8 Lectures)

- Beta blockers-propranolol, atenolol, metoprolol, bisoprolol carvedilol, esmolol.
- Nitrates-nitroglycerine, isosorbide dinitrate, isosorbide mononitrate, transdermal nitrate patches Calcium channel blockers-nifedipine, verapamil, dilteazem, amlodipine

UNIT-II: Anti-Failure Agents (8 Lectures)

- Diuretics-furosemide, torsamide, thiazide diuretics, metolazone, spironolactone, combination diuretics
- Angiotensin convertying enzyme (ACE) inhibitors – captopril ,Enalapril, ramipril, lisinopril, ACE inhibitors for diabetics and hypertensive renal disease
- Digitalis and acute ionotropes – digoxin, odoubutamine, dopamine, adrenaline, noradrenaline, isoprenaline

UNIT-III: Anti-Hypertensive Drugs (5 Lectures)

- Diuretics, beta-blockers, ACE inhibitors, calcium antagonists, direct Vasodilators, centrally acting and peripherally acting vasodilators.

UNIT-IV: Anti- Arrhythmic Agents (5 Lectures)

- Amiodarone, adenosine, verapamil, diltiazem, lidocaine, mexiletine, Phenytoin, flecainide, bretylium, atropine

UNIT-V: Antithrombotic agents (10 Lectures)

- *Platelet inhibitors:* aspirin, clopidogrel
- *Anticoagulants:* heparin, low molecular weight heparin, warfarin
- *Fibrinolytics:* streptokinase, urokinase
- *Glycoprotein 2b3a antagonists:* abciximab, tirofiban, eptifibatide

UNIT-VI: . Lipid lowering & anti-atherosclerotic drugs (4 Lectures)

- Statins, exetimibe, niacin, fenofibrate

UNIT-VII: Miscellaneous Drugs (10 Lectures)

- Protamine
- *Nacotics:* morphine, pethidine, fentanyl
- *Sedatives:* diazepam, midazolam
- *Steroids:* hydrocortisone, oprednisolone,
- Antihistamines: diphenhydramine
- *Antibiotics:* Penicillin's, cephalosporins, aminoglycosides
- Antacids and proton pump inhibitors
- *Anaesthetic agents:* local, general

PHARMACOLOGY RELEVANT TO CARDIAC TECHNOLOGY (PRACTICAL)
Course Code: PHR.302P
Credit Hours: 1.5

- Conducted as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

ECHOCARDIOGRAPHY (THEORY)
Course Code: CAT.303T
Credit Hours: 4
Semester: V

UNIT-I: Echocardiography (25 Lectures)

- Principle of Echocardiography
- Transducers
- Anatomical Planes for Viewing in Echocardiography
- *Normal M-Mode Echo Study:* Anatomy / Function: Measurements
- *Normal 2D Echo Study:* Anatomy / Function: Measurements.
- Echo for Cardiac Function- systolic and diastolic
- *Echo in Heart Disease:* Acquired
- *Echo in Heart Disease:* Congenital
- *Contrast Echocardiaography:* Technique and Indications
- Transesophageal echocardiography
- *Echo Cardiography:* Technician's Role: Disposables,Archiving, Record Keeping, Stock-Indents, Stock Maintenance, Stock Verification

UNIT-II: Principles of Doppler (25 Lectures)

- Measurement of Flows and Gradients
- Assessment of gradients, shunts, valve areas, cardiac output
- Assessment of valve regurgitations
- Utility of Doppler in Assessment of Cardiac Disease
- Tissue Doppler
- Stress Echocardiography: Protocols, 2D Echo Views, Analysis
- Trans -esophageal Echo: Indication / Contraindication, Patient Preparation
- Transducer: Maintenance, Sterilization, Handling etc.
- Monitoring, Emergency Drugs, Utility
- Intra Vascular Ultrasound, Intracoronary Doppler wire

UNIT-III: Holter Recording (10 Lectures)

- Principles of Holter
- Utility and indications
- Analysis of Holter

ECHOCARDIOGRAPHY (PRACTICAL)
Course Code: CAT.303P
Credit Hours: 2

- Demonstration of techniques as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	**Marks**
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

CARDIAC CARE TECHNOLOGY - APPLIED (THEORY)
Course Code: CAT.304T
Credit Hours: 4
Semester: V

- ECG in myocardial infarction- definition of myocardial infarction, diagnosis of myocardial infarction, ECG criteria for myocardial infarction, ECG in anterior wall, inferior wall, true posterior wall and sub endocardial infarction and RV infarction.
- ECG in rheumatic heart disease – definition of rheumatic heart disease, valvular involvement in rheumatic heart disease, ECG in mitral stenosis, mitral incompetence, aortic stenosis and aortic incompetence.
- ECG in hypertension- definition of hypertension, how to record blood pressure, ECG in hypertension.
- ECG in congenital heart disease- common congenital heart disease ASD, VSD, PDA, pulmonary stenosis, aortic stenosis, coarctation of aorta, TOF, definition of all these conditions , ECG changes in all these conditions.
- ECG in other conditions – ECG in various types of cardiomyopathy, myxoedema, pericardial effusion, acute pericardities and other vascular diseases. Bundle branch block, WPW syndrome, Dextrocardia.
- Trans esophageal echocardiogram – indications, procedure, usefulness and complications one may encounter and its management.
- Stress Echo- procedure and indications.
- Peripheral Doppler – Procedure and usefulness of peripheral Doppler.
- Coronary angioplasty–procedure, materials used, complication and management.
- Peripheral angioplasty – materials used and procedure. Angioplasty of coarctation of aorta.
- Fetal echocardiogram – Procedure, basic interpretation.
- Contrast echocardiogram – procedure and usefulness of contrast echocardiogram.
- Myocardial contrast echo- Basic knowledge.

CARDIAC CARE TECHNOLOGY - APPLIED (PRACTICAL)
Course Code: CAT.304P
Credit Hours: 2

- Demonstration of techniques as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

HEALTHCARE
Course Code: PMS.305T
Credit Hours: 2
Semester: V

UNIT-I: Introduction to Health (10 Lectures)

- Definition of health, determinants of health, health indicators of India, health team concept.
- National health policy
- National health programmes (Briefly objectives and scope)
- Population of India and family welfare programme in India

UNIT-II: Introduction to Nursing (15 Lectures)

- What is nursing? Nursing principles, inter-personnel relationships.
- *Bandaging:* basic turns, bandaging extremities, triangular bandages and their application.
- Nursing position, prone, lateral, dorsal, dorsal recumbent, Fowler's positions, comfort measures, bed making, rest and sleep.
- *Lifting and transporting patients:* lifting patients up in the bed, transferring from bed to wheel chair, transferring from bed to stretcher.
- Bed side management: giving and taking bed pan, urinal.
- Observation of stools, urine, sputum
- Use and care of catheters, enema giving.
- *Methods of giving nourishment:* feeding, tube feeding, drips, transfusion.
- Recording of body temperature, respiration and pulse.
- Simple aseptic techniques, sterilization and disinfection.
- *Surgical dressing:* observation of dressing procedures.

UNIT-III: First Aid (15 Lectures)

- Physical Exam and SAMPLE History
- Documentation and Legal Considerations
- Sudden Illness, Bleeding
- Caring for Shock, Burns, Injuries to muscles, bones, and joints, Splints, Bites and Stings
- Administering Epinephrine
- Assisting with bronchodilators (inhalers)
- Heat/Cold Related Emergencies
- In-line stabilization for head, neck and back injuries
- First Aid Kits, Fire & safety

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

DIETARY MANAGEMENT OF COMMON DISEASES
Course Code: PMS.306T
Credit Hours: 2
Semester: V

UNIT – I **(10 Lectures)**

- Diet Therapy: Routine hospital diet, Regular diet, Light diet, Soft Diet, Full liquid diet.
- Diet in fevers and infections – Typhoid, Malaria and Tuberculosis.
- Diet in gastro intestinal disorders: Diarrhoea, Constipation, Peptic ulcer

UNIT – II **(20 Lectures)**

- Diet in Diabetes mellitus – Classification, predisposing factors, Diagnosis, Dietary management.
- Diet in Cardiovascular diseases – Dietary management in atherosclerosis and hypertension.
- Diet in diseases of liver and gall bladder.
- Diet in Renal diseases
- Dietary Management in glomerulonephritis
- Dietary Management in Acute and chronic renal failure.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

TREADMILL EXERCISE STRESS TESTING & AMBULATORY ECG RECORDING (THEORY)
Course Code: CAT.307T
Credit Hours: 3
Semester: VI

- Exercise physiology
- Exercise protocols
- Lead systems
- Patient preparation
- ST segment displacement – types and measurement
- Non-electrocardiographic observations
- Exercise test indications, contra-indications and precautions
- Cardiac arrhythmias and conduction disturbances during stress testing
- Emergencies in the stress testing laboratory
- Principles of Holter Recording
- Connections of the Holter recorder
- Holter Analysis
- Guidelines for ambulatory electrocardiography

TREADMILL EXERCISE STRESS TESTING & AMBULATORY ECG RECORDING (PRACTICAL)
Course Code: CAT.307P
Credit Hours: 1.5

- Demonstration of techniques as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

CARDIAC CATHETERIZATION-III (THEORY)
Course Code: CAT.308T
Credit Hours: 3
Semester: VI

Pacing and Electrophysiology

- Arrhythmias: Brady and Tachy Arrhythmias
- Indication For Temporary / Permanent Pacing
- Technique: Temporary Pacing
- Permanent Pacing: VVI, AAI Pacing (Single Chamber Pacing)
- Permanent Pacing: DDD , other Modes of Pacing
- Pacemaker Clinic: Management of Pacemaker Patients, programmers
- Intracardiac Electrogram – Technique
- Intracardiac Electrogram – Analysis, Intervals etc.
- Electrophysiological Studies
- Radio Frequency Ablation for Arrhythmia's
- Implantable Cardioverter Defibrillator
- Cardiac Arrest, Cardio Respirator Resuscitation
- Hypotension / Hypertensive Crisis
- Cardiac tamponade
  Anaphylaxis
- Emergency Drugs
- Intra-aortic Balloon Pump
- Records Keeping: Indents, Stocks, Log Books, Procedure Books etc

CARDIAC CATHETERIZATION-III (PRACTICAL)
Course Code: CAT.308p
Credit Hours: 1.5

- Conducted as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

CARDIAC CARE TECHNOLOGY-ADVANCED (THEORY)

Course Code: CAT.309T

Credit Hours: 4

Semester: VI

- Cardiac monitoring – definition, purpose of cardiac monitoring, how to Recognize various arrhythmias how to set up a intensive coronary care unit and usefulness of ICCU.
- Interpretation of TMT, report – criteria for TMT positive test contraindication for TMT conditions where TMT is not useful, complications that may occur in TMT room and its management.
- Use of defibrillator- indications, how to use the defibrillator, complications during the procedure and its management.
- Management of cardiac arrest – definition, causes external cardiac massage, artificial respiration and other drugs and procedures used in the management of Cardiac arrest.
- Myocardial perfusion scan – procedures and usefulness of myocardial perfusion scan.
- Cardiac arrhythmias – bradyarrhythmia and tachy arrhythmias and ECG diagnosis of all rhythm disturbances. Sinus arrhythmia, APC, FPC, VPC, VF, VT, AF, SVT, I0HB, II0HB, complete heart block.
- Electrolyte disturbances – ECG in hypokelemia, hyperkelemia etc.
- Holter monitoring – procedure and usefulness.
- Valvoplasties- procedure, indications, complications and treatment of balloons, mitral valvuloplasty, balloon aortic valvuloplasty ballon pulmonary valvuloplasty and balloon tricuspid valvuloplasty.
- Coil closure and device closure of PDA – procedure, indications and materials used for coil and device closure of PDA.
- Device closure of ASD – procedure, indications and materials used for device closure of ASD.
- Device closure of VSD – procedure, indications and materials used for device closure of VSD.
- Electrophysiological studies – basic knowledge of EP studies mapping and ablation.
- Oxymetry – handling of the instrument and usefulness of the instrument, normal and abnormal values.
- pressure recording- handling of the instrument and pressures in various chambers, normal and abnormal values.
- Temporary and permanent pacing – materials used, procedure, and complications one may encounter and management. Implantable Cardioverter defibrillator devices.
- CD recording and storage- recording and storage of all the procedures over CD.
- Procedure during pregnancy- precautions to be followed.
- Nuclear Cardiology – instrumentation, radiopharmaceuticals, patient imaging techniques.

CARDIAC CARE TECHNOLOGY-ADVANCED (PRACTICAL)

Course Code: CAT.309P

Credit Hours: 2

- Conducted as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	**Marks**
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1^{st} ,2^{nd} Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

EXERCISE ELECTROCARDIOGRAPHY (ECG) (THEORY)
Course Code: CAT.310T
Credit Hours: 2
Semester: VI

- Equipments / Types of Exercise ECG
- Indication / Contradiction
- Lead Placement – Rationale, Limitation
- Monitoring during Ex. ECG: Clinical / ECG / Parameters
- Exercise ECG Protocol: Indications / Advantage and Disadvantage
- Exercise Physiology
- Exercise ECG: Preparation of Patient / Equipment / Defibrillators,Emergency Drugs
- Exercise ECG: Detection of Various Arrhythmais, Ischemia, and Plan of action
- Exercise ECG:Endpoints: Recognition and Action
- Post Exercise ECG: Observation, Instructions

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

PERFUSION TECHNOLOGY, INSTRUMENTATION & MEASUREMENTS (THEORY)
Course Code: CAT.311T
Credit Hours: 2
Semester: VI

- History and principles of operation of oxygenators, Design and efficiency of heat exchangers, oxygenators, roller pumps.
- Biocompatibility of equipment and techniques, Sterilization techniques of equipment, Technical aspects of ultra filtration.
- *Various methods and instruments for measuring the following parameters:* Temperature, cardiac output, Gas flow/concentrations, Physiological pressures, ECG, EEG, Endexpired CO_2, Blood gases, Oxygen saturation, Electrolytes, Haemoglobin/Haematocrit, Actiated coagulation.
- Adult perfusion, Paediatric perfusion, Assessment of patient (via history) before bypass, Assessment of patient post bypass, Calculation of prime components, Selection of cannulae, Assembly of equipment, Priming of oxygenator, Going on and coming off bypass, Adverse effects of CPB
- *Monitoring and control of:* Flow/pressure, Haemodilution, Haemodynamic aspect of total Heart Lung Bypass, Metabolic aspects of total Heart Lung Bypass, Acid/base balance, Oxygen and carbon dioxide exchange, Patient core temperature, Anticoagulation, Hypothermia, Total circulatory arrest, Pressure, Flow, Resistance, Adequacy of perfusion, Myocardial preservation.
- Management of complications and disasters, Auto transfusion, Recording of bypass data, Check lists, Safety of perfusion, Power and equipment failures, Preventive maintenance.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**