



## CERTIFICATE IN PHYSIOTHERAPY

**DURATION :1 YEAR**

**ELIGIBILITY : 10<sup>TH</sup> PASS**

CPT			
S.NO	PAPER CODE	NAME OF PAPERS	CREDIT
1 <sup>ST</sup> YEAR			
1	101	HUMAN ANATOMY	4
2	102	HUMAN PHYSIOLOGY	4
3	103	FUNDAMENTALS OF KINESIOLOGY & KINESIOTHERAPY	4
4	104	ENGLISH COMMUNICATION & SOFT SKILLS	3
5	105	GENERAL MICROBIOLOGY	4
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7	107	COMPUTER FUNDAMENTALS	3
8	108	PRACTICAL-I	3
9	109	CLINICAL TRAINING-I	2

### 101 HUMAN ANATOMY

#### Unit -1

Terminology and General Plan of the Body, Body Parts and Areas, Terms of Location and Position, Body Cavities and Their Membranes, Dorsal cavity, Ventral cavity, Planes and Sections

#### Unit -II

Cells: Structure, function and location, Prokaryotic and eukaryotic cells, Cell organelles, Cell division  
Tissue, Types, Structure, Location and Function of Epithelial Tissue, Connective Tissue, Muscle Tissue, Nerve Tissue, Membranes, Glandular tissue

The Integumentary System: structure and function of The Skin, Subcutaneous Tissue

#### Unit-III

Musculoskeletal System: Basic anatomy of important muscles and bones

#### Unit-IV

Respiratory system: Basic anatomy of nose, larynx, trachea, bronchi and lungs

#### Unit - V

Digestive system: basic anatomy of oesophagus, stomach, small intestine, large intestine, liver, gall bladder, pancreas

### 102 HUMAN PHYSIOLOGY

#### Unit-I

Cell physiology: Structure, membrane, transport across cell membrane, Active, Passive, Organization

of the Body, Body Composition, Body Fluid Volumes and its measurement, Diffusion, Osmosis, Tonicity, Homeostasis

**Unit-II**

Blood-composition, function, cellular component & their function, haemoglobin & anaemia, blood groups and coagulation

Lymphatic system-Composition & function of lymph, lymphatic tissue, Immunity with the role of thymus

**Unit-III**

Cardiovascular system-general arrange, heart, arteries, veins and capillaries, heart structure and function, cardiac cycle, heart sounds, heart rate, blood pressure, mechanism of circulation, definition of hypertension & shock

**Unit-IV**

Respiratory system: parts of respiratory system, mechanism of respiration, pulmonary function, pulmonary circulation, lungs volume, Gas transport between lungs and tissues, Definition of hypoxia, dyspnoea, cyanosis, asphyxia and obstructive airways diseases

**Unit- V**

Gastrointestinal physiology: Organs of GIT and their structure & function, secretion, digestion, absorption and assimilation, gastrointestinal hormones, physiology of digestion of carbohydrates, proteins & lipids, Structure & function of liver, spleen, gall bladder & pancreas, Jaundice, Cirrhosis & Pancreatitis

**103 FUNDAMENTALS OF KINESIOLOGY & KINESIOTHERAPY**

**Unit- I**

**BIO-PHYSICS RELATED TO KINESIOTHERAPY**

a. Starting Positions & Derived Positions

- i. Application of stability
- ii. BOS, Gravity and muscle work in relation to various positions

b. Therapeutic Gymnasium

- i. Use of accessories such as Pulleys Springs, Shoulder wheel, Walking aids,
- ii. Finger ladder, Therapeutic balls, Weights, Resistance bands, tubes, & wands
- iii. Applied mechanics of all above accessories

c. Suspension Therapy

- i. Principles
- ii. Suspension Apparatus
- iii. Types of Suspension
- iv. Effects and uses
- v. Techniques for individual joints

**Unit-II**

**CLASSIFICATION OF MOVEMENTS**

- a. Definition and classification
- b. Principles of movements
- c. Effects, uses and Techniques (active: assisted, free, assisted-resisted, resisted & passive)

**Unit-III**

**BASIC EVALUATION**

- a. Assessment of Vital Parameters
  - i. Temperature
  - ii. Blood Pressure
  - iii. Heart Rate/ Pulse rate
  - iv. Respiratory Rate
  - v. Chest expansion

- b. Assessment of Sensations and Reflex testing
- c. Goniometry
  - i. Definition and Types of Goniometers
  - ii. Principles
  - iii. Techniques for individual joints with biomechanical principles
  - iv. Uses

#### **Unit-IV**

##### **MASSAGE**

- a. Definition
- b. Classification
- c. Principles
- d. Effects & uses
- e. Indications and contra indications
- f. Techniques-Upper limb, Lower Limb, Neck, Back, Abdomen, Face & Scalp

#### **Unit-V**

##### **RELAXATION**

- a. Principles,
- b. Techniques along with their effects & uses
  - i. General -Jacobson's, Shavasana & Reciprocal ( Laura Mitchell )
  - ii. Local -Heat, Massage, Gentle/Rhythmic passive movements

### **104 ENGLISH COMMUNICATION & SOFT SKILLS**

#### **UNIT-I: Introduction to English language**

- a) Role and significance of English language in the present scenario
- b) English Language: Its relevance for the Indian industry
- c) Introduction to Listening, Speaking, Reading, Writing (LSRW) and benchmarking of the class  
[Note: As part of classroom activity, a guest lecture from an industry representative/Director (CRC) and maintaining progress card for each student on LSRW for future reference]

#### **UNIT-II: Phonetics & Functional Grammar**

- a) Pronunciation and daily usage correction (speak with differences between p/b, s/sh, f/ph, t/d, v/w sounds)
- b) Parts of speech, articles, tenses, verbs and modals
- c) Practice of daily use words, numerals and tongue twisters
- d) Vocabulary building, Construction of simple sentences: Basic sentence pattern, subject and Predicate  
[Note: As part of classroom activity, language games, tongue & jaw exercises, simple passages from the newspapers for oral drills in the classroom and practice tests (written and oral)]

#### **UNIT-III: English Communication- About Myself**

- a) Let's talk, making conversation, meeting and greeting
- b) Introducing myself, my family and my friends
- c) My opinions, my likes and dislikes
- d) Life at college, hostel and workplace  
[Note: As part of classroom activity, use the Workbook for reference for classroom and home assignments, carry out practice tests (written and oral)]

#### **UNIT-IV: Personality Development**

- a) First impression: Dressing sense, good manners, speaking well and respectably
- b) Positive Attitude: Being happy and alert, a good listener and a good friend
- c) Consultation among peers: Soliciting advice and giving advice
- d) Goal setting, confidence building & handling rejection  
[Note: As part of classroom activity, refer Workbook for classroom and home assignments, carry out practice tests (written and oral)]

## 105 GENERAL MICROBIOLOGY

### Unit-I

Development of microbiology as a discipline, Contributions of Anton von Leeuwenhoek, Louis Pasteur, Robert Koch, Joseph Lister, Alexander Fleming, Edward Jenner

Introduction to bacterial taxonomy, Classification of Bacteria, Morphology based on size, shape, arrangement, motility, flagella, spores, capsules, cell wall, plasma membrane, pili, ribosomes.

### Unit-II

Microscopy: Study of compound microscope – magnification, numerical aperture, resolution and components of microscope. Dark ground illumination, care of microscope and common difficulties micrometry. Bright Field Microscope, Dark Field Microscope, Phase Contrast Microscope, Fluorescence Microscope, Transmission Electron Microscope, Scanning Electron Microscope

### Unit-III

Cell size, shape and arrangement, cell-wall, composition and detailed structure of Gram-positive and Gram-negative cell walls, Cell Membrane: Structure, function and chemical composition of bacterial cell membranes. Cytoplasm: Ribosome, mesosomes, inclusion bodies, nucleoid, chromosome and plasmids, Endospore: Structure, formation

### Unit-IV

General safety measures used in Microbiology laboratory, Sterilization and disinfection: Various physical methods of sterilization – heat, UV radiation, ionizing radiation, filtration, characters affecting sterilization, auto clave control and sterilization indicators.

Biomedical waste management in a Medical Microbiology laboratory: Types of the waste generated, Segregation, Treatment, Disposal

### Unit-V

Antiseptics & Disinfectants: Definition, types and properties, mode of action, use, qualities of good disinfectants

Chemical disinfectants – phenol and its compounds, alcohol, halogen, heavy metals and quaternary ammonium compounds, aldehyde, gaseous compound. use and abuse of disinfectants. precautions while using the disinfectants.

## 106 FUNDAMENTALS OF ELECTROTHERAPY

### Unit-I

#### Fundamentals of Low frequency currents

#### i. Basic Physics:

Structure of atom, Isotopes, States of matter; Compound formation-(covalent formation), Properties of Electric lines of forces, Conductors, Non-conductors, Latent heat, Transmission of heat

#### ii. Condenser

- a) Principles
- b) Capacity
- c) Types & construction
- d) Electric field
- e) Charging and discharging of the condenser
- f) Duration of Discharge
- g) Discharge through inductance
- h) Capacitive reactance & uses of condenser

#### iii. Main supply:

- a) Production of Electricity
- b) Types: A.C./D.C.
- c) Distribution/ Grid system wiring of the house, colour coding of electrical supply to the apparatus
- d) Earthing and its importance
- e) Types of Plugs & Switches

#### iv. Shock

- a) Definition
- b) Types ( Electric Shock & Earth shock)

- c) Severity
- Causes, Effects & Precaution
- v. Static Electricity:
  - a) Theory of Electricity
  - b) Production of Electric Charge
  - c) Characteristics of charged electrical body and capacitor and inductance: types & uses
  - d) Potential difference
- vi. Current electricity
  - a) EMF
  - b) Resistance: Combination of resistance in series and parallel
  - c) Ohms Law
  - d) D.C., A.C.
  - e) Devices for regulating current: Identification, functioning & Uses-Rheostat, Potentiometer, Ammeters, Oscilloscopes, Voltmeter
  - f) Voltage and Power
  - g) Thermal effects of electric current-Joule's Law.
- vii. Electrical Skin Resistance:
  - a) Skin Resistance
  - b) Factors affecting Skin resistance: types of electrodes used, electrode gels, skin threshold, skin type, skin temperature, exercises
  - c) Methods to reduce skin resistance
- viii. Faradic currents: Duration, frequency, wave forms & graphical representation, surging, faradic type current, pulse width modulation,
- ix. Galvanic currents/ Direct current: and interrupted galvanic current, duration, frequency, waveforms & graphical representation

## **Unit II**

### **Fundamentals of High frequency currents**

- i. Electro Magnetic Induction:
  - a) Production
  - b) Direction of induced EMF
  - c) Strength of induced EMF
  - d) Type -Self & Mutual induction
  - e) Inductive Reactance
  - f) Eddy currents
  - g. Principles and Laws -Faraday's , Lenz's
  - h. Dynamo
- ii. Apparatus for Modification of Currents:
  - a) Interruption of current -Switch & Valve
  - b) C-R timing circuit
  - c) Multivibrator Circuit, Pulse Generator
  - d) Current supplied to patient -Impulse type
- iii. Magnetism:
  - a) Nature and Types
  - b) Molecular theory of Magnetism
  - c) Property of Magnet
  - d) Magnetic effect of electric current -Electro Magnets
  - e) Meters for measuring A.C.
- iv. Sound:
  - a) Wave motion in sound
  - b) Infrasonics
  - c) Normal hearing band
  - d) Characteristics of sound waves and their velocities
  - e) Ultrasonics
  - f) Reflection, Refraction and Attenuation of Sound waves
  - g) Interference of sound waves

v. D.C. and A.C.:

- a) Source –Cell and rectified AC
- b) Rectification of AC
- c) Thermionic valves –Diode and Triode
- d) Metal Rectifier
- e) Types of Rectification
- f) Transformers-Types & Functions
- g) 2 Smoothing circuit
- h) Semiconductor and its types
- i) Diodes & Transistors
- j) Choke coil

#### **Unit-III**

#### **Electro Magnetic Spectrum**

- i. Laws of transmission Reflection –Refraction –Absorption –Attenuation
- ii. Electro Magnetic Radiation
- iii. Laws Governing E.M.R.
- iv. Laws of Reflection, Refraction, Absorption, Attenuation, Cosine Law, Inverse Square Law, Grothus Law

#### **Unit-IV**

#### **ELECTRICAL MODALITIES**

**Production, Physical principles, Panel diagrams, Testing of apparatus of the following:**

- a. S.W.D.
- b. Ultrasound
- c. U.V.R.
- d. I.F.T.
- e. I.R.
- f. LASER (no panel diagram)
- g. Diagnostic Electrical Muscle Stimulator,
- h. T.E.N.S.

#### **Unit- V**

#### **SUPERFICIAL THERMAL AGENTS**

Construction/Design of the Modalities, Scales of temperature, Specific heat & modes of energy transfer, Physiological effects, Therapeutic effects/ Uses, Merits/demerits, Indications/contra-indications, Skills of application:

- a. Home remedies
- b. Paraffin wax bath
- c. whirl pool
- d. contrast bath
- e. Hydro-collator hot packs
- f. Cryotherapy

### **107 COMPUTER FUNDAMENTALS**

#### **Unit-I**

Introduction to computer: Introduction, characteristics of computer, block diagram of computer, generations of computer, computer languages. Input output devices: Input devices(keyboard, point and draw devices, data scanning devices, digitizer, electronic card reader, voice recognition devices, vision-input devices), output devices(monitors, pointers, plotters, screen image projector, voice response systems).

Processor and memory: The Central Processing Unit (CPU), main memory. Storage Devices: Sequential and direct access devices, magnetic tape, magnetic disk, optical disk, mass storage devices.

#### **Unit-II**

Introduction of windows: History, features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resizing, minimizing and maximizing, etc.).

### **Unit-III**

Introduction to MS-Word: introduction, components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge.

Introduction to Excel: introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs.

Introduction to power-point: introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs.

### **Unit-IV**

Introduction of Operating System: introduction, operating system concepts, types of operating system, Computer networks: introduction, types of network (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of network.

Electronic Payment Systems: Introduction, Types of Electronic Payment Systems, Digital Token-Based, Electronic Payment Systems, Smart Card and Electronic Payment Systems, Credit Card- Based Electronic Payment Systems, Risk and Electronic Payment Systems.

### **Unit-V**

Internet and its Applications: definition, brief history, basic services (E-Mail, File Transfer Protocol, telnet, the World Wide Web (WWW)), www browsers, use of the internet.

## **108 PRACTICAL-I**

### **Practical Human Anatomy**

1. Demonstration of Major organs through models and permanent slides.
2. Demonstration of parts of circulatory system from models.
3. Demonstration of parts of respiratory system from models.
4. Demonstration of digestive system from models.
5. Demonstration of excretory system from models.
6. Demonstration of nervous system from models.
7. Structure of eye and ear
8. Demonstration of structural differences between skeletal, smooth and cardiac muscles.
9. Demonstration of various bones
10. Demonstration of various joints
11. Demonstration of various parts of male & female reproductive system from models

### **Practical Human Physiology**

1. To measure pulse rate
2. To measure blood pressure
3. Demonstration of ECG
4. To perform Hemoglobin by Sahli's Method
5. To perform Hemoglobin by CMG method.
6. Haemoglobin by CMG method.
7. To perform Total RBC count.
8. To perform total leucocyte count.
9. To perform differential leucocyte count.
10. To perform PCV
11. To calculate Red cell indices.

### **Practical fundamentals of kinesiology & kinesiotherapy**

1. Various starting and derived positions
2. The techniques of active, passive, assisted and resisted movements
3. The techniques of various accessories and equipments used in therapeutic gymnasium its biomechanical principles and uses.
4. The techniques of use of suspension method for assisted and resisted movements
5. Relaxation procedures
6. Massage techniques

7. Yogasanas and Pranayama
8. Aerobic exercise for self and others
9. Assessment of vital parameters in different body position (supine, sitting and standing) and of sensory system and reflexes.
10. Measurement of joint R.O.M. throughgoniometry, method of fixation and measurement.

### **Fundamentals of Microbiology**

1. Demonstration of Microscope and its parts
2. Demonstration of glassware used in microbiology.
3. Demonstration of autoclave and sterilization of glass wares.
4. Demonstration of Hot air oven and sterilization of glass wares.
5. To perform Gram staining
6. To perform Acid fast staining (Zeihl Neelsen staining)
7. To perform Indian ink staining
8. To perform Hanging drop method
9. Demonstration of capsule
10. Staining of bacterial spores
11. To demonstrate agglutination reaction.
12. To perform RA test
13. To perform WIDAL test
14. To perform RPR test.
15. To perform CRP test.

### **Practical fundamentals of electrotherapy**

1. Various ELECTRICAL COMPONENTS like Diodes & Triodes, Rheostat, Capacitor, Potentiometer, Switches, Plugs and Pulse generator
2. The technique of testing of mains supply
3. The techniques of testing the following ALONG WITH PANEL DIAGRAM:
  - i. Low Frequency currents-Diagnostic Muscle stimulator, Transcutaneous Nerve Stimulation
  - ii. Medium Frequency currents-I.F.T.
  - iii. High Frequency currents-Short Wave Diathermy, Ultrasound
  - iv. I.R. (no panel diagram)
  - v. U.V.R. (no panel diagram)
  - vi. LASER (no panel diagram)
4. The skill of application of THERMAL AGENTS (on models) :
  - i. Hot packs
  - ii. P.W.B.
  - iii. Whirlpool
  - iv. Contrast bath
  - v. Cryotherapy

### **Practical: Basics of Computer**

Computer fundamental and internet lab

1. Using basic DOS commands.
2. Using external DOS commands
3. Creating a email account
4. Using web browser for searching and surfing.
5. Creating and formatting a document in MS office
6. Using autocorrect, auto text and spell check operation in MS office .
7. Create tables in MS Word.
8. Inserting different kinds of object in MS word.
9. Use main merge options in MS office.
10. Create a Excel work sheet with following options rows and columns alignment..
11. Using excel formulas.
12. Create a graph with available data in MS excel.
13. Create a PPT presentation using auto content wizard.
14. Use Clip art animation effects and word art galleries in presentations.
15. Using transition and setting timings for slide show.



16. Use MS access to create data base and tables.

**109 CLINICAL TRAINING-I**

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