

**Maharashtra University of Health Science, Nashik**  
**Physiotherapy Syllabus**  
**I - B.P.Th.**

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[Applicable to the batches admitted from the year 2007-08]

**I-B.P.Th Transcript hrs-1440**

Subjects -

1]	Introduction to physiotherapy -----	10 hrs
2]	Human Anatomy -----	235 hrs
3]	Human Physiology -----	235 hrs
4]	Biochemistry -----	40 hrs
5]	Fundamentals Exercise Therapy -----	250 hrs
6]	Fundamentals of Electro Therapy -----	200 hrs
7]	Seminar -----	60 hrs
8]	Supervised clinical practice -----	410 hrs

[Clinical assignments should include Observation, Clinical History taking, & technical assistance to the senior clinical staff of the Therapeutic Gymnasium [Fundamentals of Exercise therapy] & Electro Therapy sections at the O.P.D. set up. The student should maintain a Journal/ File in which the "ATTITUDE" assessment chart & documentation of minimum 15 case histories to be included per assignment. The student should get all the documents duly signed by the section In-Charge with his/her assessment remarks at the end of each respective assignment.

**INTRODUCTION TO PHYSIOTHERAPY**

Objective – By the end of the 10 hours of introduction, the candidate will –

- 1] acquire the geographical orientation of the various concerned section of the college & the clinical training areas.
- 2] get the overall idea about the graduate program & its scope in the professional practice
- 3] learn the Bed-side manners, General Ethical code & discipline of the Department
- 4] Acquire the skill of History taking in general

# HUMAN ANATOMY

[235 HRS]

**Didactic – 160 HRS – Practical / Laboratory – 75 hrs**

Goal – To provide the student with the necessary Anatomical knowledge & skills to practice as a qualified Physiotherapist

## Objectives-

### 1] MUSCULO – SKELETAL –

- i) The student should be able to identify & Describe Anatomical aspects of muscle bones & joints, & to understand and Analyze movements.
- ii) To understand the Anatomical basis of various clinical conditions e.g. trauma, deformities, pertaining to limbs & spine.
- iii) To be able to localize various surface land-marks;
- iv) To understand & describe the mechanism of posture & gait the Anatomical basis of abnormal gait.

### 2] In NEURO – Anatomy –

- i) to identify & describe various parts of C.N.S. – fore – brain, Midbrain, Hind-brain Brain stem, courses of cranial nerves; functional components, course distribution. Anatomical bases of clinical lesions:
- ii) to describe the source & course of spinal tracts;
- iii) to describe blood circulation of C.N.S. & spine;
- iv) be able to identify the components of various Trans – sections.

**3] THORAX** – to identify & describe various components of the contents of the Thorax – with special emphasis to tracheo-bronchial tree, & cardio – pulmonary system.

**4] CIRCULATORY – I)** be able to identify & describe the source & course of major arterial venous & Lymphatic system, with special emphasis to extremities, Spine & Thora

### 5] PSYCHO-MOTOR –

- i) to be able to demonstrate the movements of various joints –
- ii) distinguish cranial & peripheral nerves
- iii) distinguish major arteries, veins & Lymphatics with special emphases to extremities, & spine.

## Syllabus –

1] GENERAL Anatomy ----- 10 hours  
Including Histology – Basic tissues like epithelial, Connective, muscular, nervous, system.

2] MUSCULO SKELETAL Anatomy [dissection / prosection mandatory ]

- i) superior extremity with shoulder girdle ----- 25 hours
- ii) Inferior extremity with pelvic girdle & pelvic floor muscles ----- 25 hours
- iii) spine, head & neck ----- 25 hours
- iv) facial muscles & T.M. joint ----- 7 hours
- v) Surface Anatomy ----- 8 hours

3] NEURO –Anatomy ----- 60 hours

- i) General organization of C.N.S.
- ii) Cranial nerves
- iii) peripheral nervous system
- iv) C.N.S.

**Total – 160 hours**

4] SYSTEMIC ANATOMY –

- i. Elementary system ----- 8 hrs
- ii. Uro –genital system [special emphasis to Female organs ] ----- 10 hrs
- iii. Micro – Anatomy (cartilage, bone, nerve, muscle) ----- 10 hrs
- iv. Cardio – vascular [including Lymphatic] ----- 10 hrs
- v. Respiratory system ----- 6 hrs
- vi. Neuro – muscular junction ----- 2 hrs
- vii. Axial skeletal ----- 4 hrs
- viii. Appendicular system ----- 10 hrs
- ix. Sensory organs ----- 8 hrs
- x. Endocrine ----- 2 hrs
- xi. Radiological ----- 5 hrs

**Total - 75 hrs**

## TEXT BOOKS

1. Human Anatomy – by Snell
2. Anatomy by Chaurasia all 3 volumes
3. Neuro anatomy by Inderbir Singh
4. Human Anatomy by Kadasne (All three volumes)

**REFERENCE BOOKS**

- 1. Gray’s Anatomy
- 2. Extremities by Quining Wasb
- 3. Atlas of Histology by Mariano De Fiore
- 4. Anatomy & Physiology by Smout and McDowell
- 5. Kinesiology by Katherine Wells
- 6. Neuroanatomy by Snell
- 7. Neuroanatomy by Vishram Singh

**SCHEME OF EXAMINATION**

**THEORY – 80 MARKS** + Int. assessment – 20 marks Total ..... 100 Marks

Model question paper – 80 Marks

**Section A) Q1) M.C.Q.**

-based on Single best response ..... [20 x 1] --- 20 marks – [20 minutes]

This question should include topics covered in syllabus –

**Section B) S.A.Q.**

Q2) Answer any Five out of Six -..... [ 3 x 5] ----- 15 marks

This question should include

- i] Digestive ii] /uro-genital iii] reproductive system iv] special senses – eye /ear/skin
- v] circulatory system.

Q3) Answer any 3 out of 4 ..... [ 5 x 3] ----- 15 marks

This question should include i] Thorax ii] soft parts upper limb iii] soft part lower limb  
iv] soft parts Thorax /spine / neck

**Section C) L.A.Q.**

Q4) Compulsory – based Musculo Skeletal system [including Kinesiology] 15marks

Q5) should be based on Neuro-Anatomy [including cranial nerves with emphasis to V,VII, VIII, IX & XII nerves ..... 15 marks

**OR**

Q5) .....15 marks

**PRACTICAL – 80 MARKS** + Internal assessment – 20 marks = Total 100 marks

should include

**1] Spots** ----- 60 marks

**2] Viva** ----- 15 marks

Journal ----- 05 marks

**INTERNAL ASSESSMENT**

**THEORY:**

Two exams – Terminal and prelims of 80 marks each TOTAL 160 marks

Section A) Q1) M.C.Q.-based on Single best response – [20 x 1] -- 20marks

This question should include topics covered in syllabus-

Section B) S.A.Q.- Q.2)-Answer any Five out of Six [3 X 5]----- 15marks

This question should include

i]-Digestive ii]-uro-genital iii]-reproductive system

iv] - special senses-eye/ear/skin v]-circulatory system

Q.3) - Answer any 3 out of 4 [5 X 3] ----- 15 marks

This question should include

i]-Thorax

ii]-soft parts upper limb

iii]-soft part-lower limb

iv]-soft parts Thorax/ spine / neck

Section C) L.A.Q-Q.4) based Musculo Skeletal system [including Kinesiology]--- 15 marks

Q.5) should be based on Neuro-Anatomy [including cranial nerves with

Emphasis to V, VII, VIII, IX & XII nerves ----- 15 marks

**OR**

Q.5) ----- 15 marks

**I.A. to be calculated out of 20 marks**

**PRACTICAL:**

Two exams – Terminal and prelims of 80 marks each TOTAL 160 marks

1. SPOTS ----- 60 MARKS

2. Viva ----- 15 marks

3. Journal ----- 05 marks

**I.A. to be calculated out of 20**

# HUMAN PHYSIOLOGY

Theory – 155 Hrs, Practical / Laboratory – 80 Hrs

[235 HRS]

**Objectives:** At the end of the course, the candidate will –

- 1) acquire the knowledge of the relative contribution of each organ system in maintenance of the milieu interior (Homeostasis)
- 2) be able to describe physiological functions of various systems, with special reference to Musculo-skeletal, Neuro-motor, Cardio-respiratory, Female urogenital function, & alterations in function with aging
- 3) Analyse physiological response & adaptation to environmental stresses-with special emphasis on physical activity, temperature
- 4) acquire the skill of basic clinical examination, with special emphasis to Peripheral & Central Nervous system, Cardiovascular & Respiratory system, & Exercise tolerance / Ergography.

## Syllabus:

- 1) GENERAL Physiology Structure of cell membrane. Transport across cell membrane and Homeostasis ---- (only short notes) ----- 4hrs
- 2) **BLOOD**- Rh- A B O system & mismatch-transfusion WBC plasma protein Erythrocytes. Hemoglobin. Normal values of Blood (Composition & function) ----- 7hrs
- 3) **NERVE** Neuron AHC ----- 8hrs
  - i) Structure, classification & Properties; ii)- R.M.P. iii)- action potential;
  - iv) Propagation of nerve impulse; v)- degeneration & regeneration
  - vi) Reaction of degeneration (retrograde)
- 4) **MUSCLE** ----- 9hrs
  - i) Structure- properties-classification-excitation/contraction coupling
  - ii) Motor unit- E.M.G.- factors affecting muscle transmission-
  - iii) Neuro-muscular transmission
- 5) **C.N.S.** ----- 32hrs
  - i) Receptor physiology-classification & properties-;
  - ii) Synapse-structure, properties, & transmission;
  - iii) Reflexes-classification & properties;
  - iv) Sensory & Motor Tracts-effect of transaction (complete & incomplete) at various levels
  - v) Physiology of Touch, Pain, Temperature & Proprioception;

- vi) Physiology of Muscle Tone (muscle spindle); Stretch
  - vii) Vestibular Apparatus mainly otolith organ Anatomy
  - viii) Connection & function of Basal ganglia, Thalamus, Hypo-Thalamus, lobes of the brain, Cerebellum, Peripheral Nervous System
  - ix) Sensory / motor cortex;
  - x) Limbic system;
  - xi) Learning, memory & condition reflex,
  - xii) Physiology of Voluntary movement
- 6)- **EXCRETORY** system ----- 10hrs
- i) Kidneys- (short note)- structure & function;
  - ii) urine formation;
  - iii) Micturition- neural control – neurogenic bladder
- 7)- **TEMPERATURE REGULATION** ----- 5hrs
- i) circulation of the skin- body fluid- electrolyte balance
- 8)- **ENDOCRINE** ----- 10hrs
- i) secretion- regulation & function of Pituitary-thyroid-adrenal-parathyroid-pancreas
- 9)- **REPRODUCTIVE** system ----- 5hrs
- i) Functions of Estrogen, Progesterone & Testosterone
  - ii) Puberty & Menopause
- 10)- **SPECIAL** senses-
- i) Eye-Errors of refraction-accommodation-reflexes-dark & light adaptation-photosensitivity Ear, Skin ----- 5hrs
- 11) -**Gastrointestinal** system ----- 5 hrs
- 12)- **RESPIRATORY** system ----- 20hrs
- i) Introduction, general organization;
  - ii) Mechanics of respiration;
  - iii) Pulmonary Volumes & capacities;
  - iv) Anatomical & Physiological Dead space-ventilation/perfusion ratio, alveolar ventilation
  - v) Transport of respiratory gases
  - vi) Nervous & Chemical control of respiration
  - vii) Pulmonary function tests-Direct & indirect method of measurement;
  - viii) Physiological changes with altitude & acclimatization

13)- **CARDIO – VASCULAR**----- 20hrs

- i) structure & properties of cardiac muscle;
- ii) Cardiac cycle;
- iii) Heart rate regulation-factors affecting;
- iv) Blood pressure- definition-regulation-factors affecting;
- v) cardiac output-regulation & function affecting;
- vi) Peripheral resistance, venous return
- vii) Regional circulation-coronary-muscular, cerebral
- viii) normal ECG.

14)- **EXERCISE** physiology ----- 10hrs

- i) Effects of acute & chronic exercises;
- ii) oxygen / CO<sub>2</sub> transport-O<sub>2</sub> debt-
- iii) effects of exercise on muscle strength, power, endurance,  
B.M.R.,R.Q.-hormonal & metabolic effects-respiratory & cardiac conditioning
- iv) AGING
- v) Training-fatigue- & recovery;
- vi) Fitness-related to age, gender, & body type

15)- **A.N.S** ----- 5hrs

- Sympathetic / parasympathetic system-adrenal medulla-functions-Neuro  
Transmitters-role in the function of pelvic floor-(micturation, defecation labour)

**TEXT BOOKS**

- 1) Course in Medical Physiology – Vol- I & II- by Dr. Chaudhary
- 2) Medical Physiology - by Dr. Bijlani
- 3) Text book on Medical Physiology – by Guyton

**REFERENCE BOOKS**

- 1) Review of medical physiology – Ganong
- 2) Samson & wright's applied physiology
- 3) Human Physiology – Chaudhary & Bijlani
- 4) Semiclingum – Essentials of Medical physiology – K. Semubulingam

## PRACTICAL

1) Haematology – (demonstration only) -----	15hrs
2) GRAPHS -----	14hrs
i) skeletal muscle-properties-pre / after load-fatigue-Starling's law	
ii) Cardiac muscle-properties-effect of Ach & Adrenaline.	
3) Physical fitness -----	12hrs
i) breath holding	
ii) mercury column test;	
iii) cardiac efficiency test- Harvad step test- Master step test	
4)- Blood pressure- effects of change in posture & exercise -----	8hrs
5)- Stethography -----	4hr
i) effect of deglutination;	
ii) voluntary hyperventilation	
6)- Spirometry -----	4hr
i) Lung volumes      ii) timed vital capacity	
7) Bicycle ergography -----	4hr
8) Perimetry -----	4hr
9) Clinical examination -----	15hrs
respi / cvs / higher functions / memory / time / orientation / reflexes / motor & sensory system	

**Total 80 hours**

## **SCHEME OF EXAMINATION**

**THEORY-80MARKS + INT. ASSESSMENT-20MARKS=TOTAL - 100MARKS**

### **Section-A-MCQ.**

Q-1) based on single Best answer ----- (20 x 1) -----	20 marks
It must include MUST KNOWN questions	

### **Section-B-SAQ.**

Q-2) Answer any Five out of Six ----- (5 x 3) -----	15 marks
Should include – i)- Blood, ii)- G.I. tract iii)- Endocrine	
iv)- Uro-genital v)- Metabolism vi)- special senses (eye/ear/skin)	
Q-3) Answer any Three out of four ----- (3 x 5) -----	15 marks
Should include i)- Cardio – vascular ii)- Respiratory iii)- Exercise	
Physiology iv)- Electrolyte balance	

### **Section-C-LAQ**

Q-4) based on Musculo-skeletal system -----	15marks
(LAQ should give breakup of 15 marks)	
Q-5) based on C.N.S./ spinal cord/Electro-Neuro-Physiology -----	15 marks

OR

Q-6)- ----- do----- 15 marks

**PRACTICAL** – 80 Marks + Internal Assessment 20 Marks – total 100 marks

- a) Spots-based on topics covered in syllabus ----- 20 marks
- b) Viva-based on 1 to 8 mentioned in practical syllabus ----- 20 marks
- c) Demonstration – on Clinical Physiology ----- 35 marks
- d) Journal ----- 05 marks

## **INTERNAL ASSESSMENT**

### **THEORY:**

Two exams – Terminal and prelims of 80 marks each TOTAL 160 marks

Section-A-MCQ-Q-1]-based on single Best answer---- [20 x 1] ----- 20 marks

It must include MUST KNOW questions

Section-B- SAQ-Q-2] Answer any Five out of Six --- [5 X 3] ----- 15 marks

Should include –

- i]-Blood,
- ii]-G.I. tract
- iii]-Endocrine
- iv] - Uro-genital
- v]- Metabolism
- vi]-special senses [eye/ear/ skin]

Q-3]-answer any Three out of four – [3 X 5] ----- 15 marks

Should include

- i] Cardio- vascular
- ii] Respiratory
- iii] Exercise Physiology
- iv] Electrolyte balance

Section-C-LAQ-Q-4]-based on Musculo-skeletal system----- 15 marks

Q-5]-based on C.N.S./ Spinal Cord/Electro-Neuro-physiology- 15 marks

OR

Q-6] -----do----- 15marks

[LAQ should give break up of 15 marks]

**I.A. to be calculated out of 20 marks**

**PRACTICAL:**

Two exams – Terminal and prelims of 80 marks each TOTAL 160 marks

1. Spots: - Based on Topics covered in syllabus----- 20 marks
2. Viva: - Based on 1-8 mentioned in practical syllabus ----- 20 marks
3. Demonstration on clinical Physiology ----- 35 marks
4. Journal ----- 05 marks

**I.A. to be calculated out of 20 marks**

# BIOCHEMISTRY

(40 hrs- Didactic only)

SN	Topic	No. of Hrs.
01	CARBOHYDRATES :- (1) Chemistry, Definition, classification with examples, functions. (2) Digestion and Absorption, glycogenesis, glycolysis, TCA cycle. Hormonal regulation of blood glucose, diabetes mellitus, glycosuria, changes in Carbohydrate, protein & lipid metabolism.	08
02	PROTEINS :- Definition, Importance, Functional, Classification Digestion & Absorption, decarboxylation, deamination, transamination, transmethylation, Urea cycle, clinical significance of serum urea, function of glycine, Phenylalanine, tryptophan, methionine tyrosine.	04
03	ENZYMES :- Definition, Modern Classification, Factors affecting enzymes Action, diagnostic & therapeutics uses & enzymes, iso-Enzymes, competitive & Non competitive inhibition.	04
04	VITAMINS :- Definition, Classification, Fat & water soluble vitamins, functions, Deficiency manifestations sources & RDA	03
05	MINERALS :- Ca, P, Fe, I, Zinc, Selenium, Fluorine, Magnesium, Function sources, Deficiency manifestations	03
06	HORMONES :- Definition with mechanism of action, classification	01
07	NUTRITION :- Composition of food, balanced diet, kwashiorkor, marasmus, nitrogen balance, major dietary constituent & they importance	03
08	<b>Clinical Biochemistry :</b> Liver function test, Renal function test, Lipid profile in serum	03
09	<b>LIPID :-</b> Definition, classification with examples, biomedical importance, Phospholipid & lipoproteins functions. Digestion & absorption of lipid B – oxidation of fatty acid with energetic, Ketone bodies and their & metaboism, cholesterol, importance of cholesterol, obesity.	04
10	Muscle Contraction :- Mechanism & Biochemical, events Connective Tissue- Biochemistry of connective tissue-collagen-Glyco-protein-proteoglycans	02
11	NUCLEIC ACID :- Function of DNA, RNA, genetic code specialized products of amino acids phenyalminetryosine trptophan, glycine, methionine. Transmionation, deamination and urea cycle (protein)	02
12	<b>Clinical Significance of some importance biochemical constituents in serum in various diseases.</b>	03
<b>Total</b>		<b>40</b>

## **TEXT BOOKS**

- 1) Biochemistry – by Dr. Deb Jyoti Das,
- 2) Biochemistry – by Dr. Satyanarayan
- 3) Text book of Biochemistry for Medical students by – Dr. Vasudevan / Shri Kumar

## **REFERENCE BOOKS**

Review of Biochemistry (24<sup>th</sup> edition) by Harpar

Biochemistry (2<sup>nd</sup> edition) by Dr.Pankaja Naik

## **SCHEME OF EXAMINATION**

### **Section A-MCQ-**

Section A- Q1) MCQ – Single best answer [10 x 1] ----- 10 marks

Section B-Q2) SAQ – To attempt any FIVE out of Six answers [5x3] ----- 15marks

Section C-Q3) LAQ To attempt any THREE out of Four answers [3 x5] ----- 15marks

### **INTERNAL ASSESEMENT**

10 marks

Two exams – Terminal and prelim examination of 40 marks each TOTAL 80 marks

Section-A- Q 1) MCQ - Single best answer - [10 x 1] ----- 10 marks

Section-B- Q 2) SAQ-To attempt any FIVE out of Six answers-[5 x 3] -----15 marks

Section-C-Q3) SAQ - To attempt any THREE out of Four answers-[3 x 5] ---15 marks

**I.A. to be calculated out of 10 marks**

# FUNDAMENTALS OF EXERCISE THERAPY

[250 hrs]

Theory – 100 & Practical / Lab – 150

BIOMECHANICS ----- didactic – 40 hrs

BIO-PHYSICS APPLIED TO MOBILISATION /

EXERCISE & HYDROTHERAPY -----didactic 30 hrs + practical/laboratory-25hrs

MASSAGE ----- didactic – 5 hrs + practical / laboratory- --- 25hrs

BASIC EVALUATION ----- didactic–10 hrs + laboratory / practical - 30hrs

BASICS IN YOGA ----- didactic–15 hrs + laboratory / practical-70hrs

**Objective:** At the end of the course, the candidate will be able –

- 1] To define the various terms used in mechanics, Biomechanics & Kinesiology
- 2] Recall the basic principles of Physics related to mechanics of movement / motion & will be able to understand the application of such principles to the simple equipment designs, & their efficacy in therapeutic gymnasium, & various starting position used in therapeutics.
- 3] to describe & also acquire the skill of use of various tools of the Therapeutic gymnasium
- 4] to demonstrate passive movements in terms of various Anatomical planes
- 5] to demonstrate various starting & derived positions
- 6] Acquire the skill of application of various massage manipulations & describe the Physiological effects, therapeutic use, merits / demerits of the same.
- 7] acquire a skill of assessment of sensations, superficial & deep reflexes, pulse rate / Blood pressure, Chest expansion / respiratory rate, & limb length / girth measurement on Models
- 8] to demonstrate & also acquire the skill of relaxation.
- 9] to describe the skill & usefulness of group & recreational activities & will be able to demonstrate general fitness exercises used in Physical Training.
- 10] be able to define Yoga & its types, its physiological & Psycho-somatic effects & will be able to demonstrate standard yoga postures used by the beginners.
- 11] be able to describe Physiological principles of aerobic exercise conditioning related to general fitness & demonstrate skill of General Fitness exercises & shall gain fitness for self.

## Syllabus:

- 1] Bio-mechanics i) Axes / planes, laws of inertia & motion, mechanics of Forces, levers, pendulum, equilibrium, Torque ii) Types of muscle work angle of pull – Mechanical advantage – applied mechanics in the Therapeutic Gymnasium.
- 2] Starting & derived positions, stability, base of support
- 3] Classification of movements, (active, passive, assisted, resisted) / Goniometry – techniques, uses, types.
- 4] Limb length (only lower limb – apparent, true, Supratrochantric) & girth measurements
- 5] Assessment of Sensations / Reflex testing
- 6] Assessment of Blood pressure / pulse rate / chest expansion & Respiratory rate
- 7] Relaxation – all methods,
- 8] Massage manipulations – principles effects / merits / demerits – skills on extremities / scalp/ spine / abdomen / face.
- 9] Therapeutic Gymnasium suspension therapy, use of accessories such as pulleys springs, shoulder wheel, axillary crutches, finger ladder, therapeutic balls parallel bars etc applied Biomechanical principles.
- 10] Physiological & Biophysical principles of Stretching, Strengthening and aerobic conditioning for general fitness exercise, Group & recreational activities – Warm up – stretching mobility strengthening – cool down.
- 11] Principles of Yoga & basic ten Yogic postures & their physiological effects Yogic postures.
  - A] 1) a] Padahasthasana Padangusthanasana b] Trikonasana, c] utkatasana
  - 2) Padmasana / Siddhasana, /Sukhasana
  - 3) Bhujangasana
  - 4) Ardha – Salabhasana
  - 5) Paschimottanasana
  - B] Savasana
  - C] 1] Dhanurasana
  - 2] Ardha Halasana
  - 3] Yogamudrasana
  - 4] Uttanasana
  - 5] Virasana
  - 6] Vajrasana
  - 7] setu bandhasana
  - 8] gomukhasana
  - 9] Pavan muktasana

- 10] Halasana
- 11] Sarvangasana
- 12] Naukasana

12] Basic principles of General fitness – warming up exercises, aerobics – cooling down exercises

13] Hydrotherapy – physics – application – effects – merits / demerits

### **PRACTICAL**

skills included in sr. no. 2 to 13 above to be practiced on self & models

### **TEXT BOOKS**

- 1] Principles of Exercise Therapy – Dena Gardiner
- 2] Massage, manipulation & traction – Sydney Litch
- 3] Therapeutic Exercise ----- do -----
- 4] Massage – Holly
- 5] Suspension Therapy in Rehabilitation – Margaret Hollis
- 6] Bio mechanics –Cynthia Norkin
- 7] Hydrotherapy – Duffield
- 8] Measurement of physical function – Cynthia Norkins.

### **REFERENCE BOOKS**

- 1] Therapeutic Exercise – Carolyn Kisner
- 2] Physiotherapy in Orthopedic conditions – by Jayant Joshi  
[for the study of Basic Yogic postures]

### **SCHEME OF EXAMINATION**

**THEORY – UNI. EXAM – 80 MARKS + INT. ASSESSMENT – 20 MARKS**

#### **Section -A-MCQ**

Q1] based on Single best answer [20 x 1] ----- 20 marks (20Min)  
[to cover the must KNOW area of the subject]

#### **Section B-SAQ**

Q2] Answer any FIVE out of Six – [5 x 3] ----- 15 marks  
Q3] Answer any THREE out of Four [3 x 5] ----- 15 marks

#### **Section C- LAQ**

Q4] [ compulsory] based on Bio-mechanics ----- 15 marks  
#Q5] based on any other topic ----- 15 marks

**OR**

# Q6] based on any other topic ----- 15 marks  
#To avoid questions based on Psychomotor domain

**PRACTICAL–80 MARKS + INT.ASSESSMENT–20 MARKS = TOTAL – 100 MARKS**

- 1 Long case – based on Massage / Goniometry ----- 35 marks
- i] Cognitive – Bio-physics / Biomechanical principles / indications – contra indication  
Documentation of findings etc ----- 20 marks
- ii] Psychomotor & affective – skills ----- 15 marks
- 2 a) Short Case :- any one of the following ----- 20 marks  
Short case Based on passive movts / Relaxation / Limb / Ength – girth /  
Sensation / Reflex testing / Yoga posture / Aerobics / group exercise / warm ups /  
BP/ & Pulse / Chest Expansion / Respirate / Starting / Derived position etc.
- b) Spots – Four spots based on therapeutics gymnasium etc. 5 minute per spots  
(4x5) = 20 marks
- 3 Journal ----- 5 marks

**INTERNAL ASSESSMENT**

**THEORY (20 marks)**

Two exams –Terminal and prelim examination of 80 marks each TOTAL -160 marks

Section-A-MCQ-Q-1]-based on -Single best answer [20 x 1] ----20marks(20 Min.)

[to cover the must KNOW area of the subject ]

Section-B-SAQ- Q-2]-Answer any FIVE out of Six—[5 x 3] ----- 15 marks

Q-3]-Answer any THREE out of Four-[3 x 5] ----- 15 marks

Section-C-LAQ-Q-4]-[compulsory]—based on Biomechanics----- 15 marks

# Q-5]-based on any other topic----- 15 marks

OR

# Q-6]-based on any other topic----- 15 marks

**I.A. to be calculated out of 20 marks**

## **PRACTICAL**

Two exams –Terminal and prelim examination of 80 marks each TOTAL -160 marks

1. Long Case:-Massage/ Goniometry ----- 35Marks

i) Cognitive – Biophysics / Biomechanical principles / indications / contraindications.

Documentation of findings etc. ----- 20 marks

ii) Psychomotor and affective skills ----- 15 marks

2. a) Short Case:- any one of the following.----- 20 Marks

Short case Based on passive movts /Relaxation/Limb/ Length -girth/  
Sensation/Reflex testing/ Yoga posture/Aerobics/group exercise/warm ups /BP &  
Pulse/Chest Expansion/Respiratory Rate/Starting & Derived position etc.

b) Spots - Four spots based on therapeutics gymnasium etc. 5 minute per spots

----- (4X5 = 20 Marks)

3. Journal ----- 5 Marks

**I.A. to be calculated out of 20 marks**

# FUNDAMENTALS OF ELECTRO THERAPY

[200 hrs]

1] MEDICAL ELECTRONICS ----- didactic 80 hrs + Practical /laboratory ---- 40 hrs

2] SUPERFICIAL THERMAL AGENTS – didactic – 15 hrs + Practical / Lab -- 65 hrs

Objectives – At the end of the course the candidate will be able to –

1] Recall the physics principles & Laws of Electricity, Electro – magnetic spectrum, & ultra sound

2] Describe effects of environmental & man made electro magnetic field at the cellular level & risk factors on prolonged exposure.

3] Describe the main electrical supply, Electric shock –precautions :-

4] Enumerate types & production of various Therapeutic electrical currents Describe the panel diagrams of the machines.

5] Describe in brief, certain common electrical components such as transistors, valves, capacitors, transformers etc & the simple instruments used to test / calibrate these components [ such as potentiometer, oscilloscope etc] of the circuitry, ; & will be able to identify such components.

6] Describe & identify various types of electrodes used in therapeutics, describe electrical skin resistance & significance of various media used to reduce skin resistance.

7] Acquire knowledge of various superficial thermal agents such as Paraffin wax bath, Cryotherapy, home made remedies, etc; their physiological & therapeutic effects, Merits / demerits; & also acquire the skill of application.

## **Syllabus:**

1] Fundamentals of Low frequency currents –

i] production of electricity, mains supply,

ii] A.C. currents & Faradic type current

iii] D.C. currents – Types – fundamentals of electrical charges, static electricity- physic of direct currents Ohm's law Conductors-Capacitors- Rheostats-Potentiometers-ammeters-oscilloscopes,

iv] types of electrodes galvanic skin resistance – electrode –gels- types significance

2] Fundamentals of High frequency currents –

i] Magnetism, E.M.F. Conduction – Lenz's Law- transformers -types,

ii] Thermonic valves,

iii] Semi – conductors – types -Transistors

iv] Electronic circuits –oscillators,, - pulse generators

- 3] E.M. spectrum – Laws of transmission reflection – refraction – absorption – attenuation.
- 4] Cellular Bio-physics – reception & emission of E.M.F. signals
- 5] Environmental currents & fields risk factors on prolonged exposure to E.M. field.
- 6] Production, Physical principles, Panel diagram, Testing of apparatus – S.W.D. Ultra sound, U.V.R., I.F.T. / Beat frequency currents, I.R. LASER (no panel diagram)
- 7] Therapeutic continuous / interrupted Direct currents & their various wave forms, A.C. current
- 8] Bio-physics of Superficial heat & cold – Physiological effects –Therapeutic effects / uses – Merits / demerits, Indications / contra-indications-skills of application-
  - i] Home remedies,
  - ii] Paraffin wax bath
  - iii] whirl pool,
  - iv] contrast bath
  - v] Hydro-collator hot packs / cold packs,
  - vi] Cry therapy

### **PRACTICALS**

- 1] Panel diagrams – Identification of components – Testing the mains supply & Machines
- 2] Skills of application of thermal agents

### **TEXT BOOKS**

1. Clayton 1s Electro therapy – 3<sup>rd</sup> & 10<sup>th</sup> ed,
2. Electro therapy explained – by Low & Read
3. Electro Therapy – by Kahn
4. Basics of Electrotherapy – Dr. Subhash Khatri

### **REFERENCE BOOK –**

Clinical Electro Therapy – by Nelson & Currier.

## SCHEME OF EXAMINATION

**Theory – 80 marks. I.A. – 20 Marks;**

Theory – model question paper – [80 marks]

### **Section A-MCQ-**

Q-1] based on Single best answer [ 20 x 1] ----- 20 marks

### **Section B-SAQ**

Q-2] to answer any FIVE out of six --- [ 5 x 3] ----- 15 marks

Q-3] to answer any THREE out of Four [ 3 x 5] ----- 15 marks

### **Section C-LAQ**

Q-4 ] based on superficial Thermal agents ----- 15 marks

\* Q-5] ----- 15 marks

OR

\* Q-6] ----- 15 marks

\*To avoid any question based on Psychomotor area

## **PRACTICAL - PRACTICAL – 80 MARKS +, I.A. – 20 MARKS TOTAL = 100 MARKS**

1] Long case based on Superficial thermal agent ----- 35 marks

[Cognitive – Medical electronic area/ Physiological –Biophysical principles /  
therapeutic effects / Indications – contraindications] ----- [20 marks]

+ [Psychomotor + Affective skills] -----[15 marks]

2] Spots

A] Identification of Electronic component & give one use with example OR panel  
Diagram ---FOUR spots [ 5 minutes per spot] (4 x 5 ) ----- [ 20 marks]

B] testing of equipment TWO spot (10 x2) [10 minutes] ----- [ 20  
marks]

Journal ----- [05 marks]

## **INTERNAL ASSESSMENT ----- 20 MARKS**

### **THEORY (20 marks)**

Two exams – Terminal and prelim examination of 80 marks each TOTAL -160 marks

Section-A-MCQ-Q-1] - based on Single best answer –[20x 1]----- 20 marks

Section-B-SAQ -Q-2] - to answer any FIVE out of six—[5 x3] ----- 15 marks

Q-3] - to answer any THREE out of Four-[3 x 5] -----15 marks

Section-C-LAQ- Q-4] - based on superficial Thermal agents----- 15 marks

\* Q-5] ----- 15 marks

OR

\* Q-6] ----- 15 marks

To avoid any question based on psychomotor area

**I.A. to be calculated out of 20 marks**

## PRACTICAL

Two exams – Terminal and prelim examination of 80 marks each TOTAL -160 marks

1. Long Case: - Superficial thermal agents----- 35 Marks  
(Cognitive – medical electronic area / physiological – Biophysical principles/therapeutic effects /  
Indications / contraindications) ----- 20 marks  
(Psychomotor + affective skills) ----- 15 marks
2. Spots ----- 40 marks
  - a) Identification of electronic component and give 1 use with example or panel diagram(4 spots, 5 min per spots) (4 x 5 = 20 marks)
  - b) Testing of equipment – 2 spots (10 minutes) (2 x 10 = 20 marks)
3. Journal ----- 5Marks

**I.A. to be calculated out of 20 marks**

**INTERNAL ASSESSMENT IN PRACTICAL ----- 20 marks**

### SCHEME OF EXAMINATION – OF I<sup>st</sup> B.P.Th

Subject	Theory	I.A.	Total	Practical	I.A.	Total
<b>ANATOMY</b> -----	80-----	20-----	100	80 -----	20 -----	100
<b>PHYSIOLOGY</b> -----	80-----	20-----	100	80 -----	20 -----	100
<b>BIOCHEMISTRY</b> -----	40-----	10-----	50	--	---	---
<b>FUNDAMENTALS OF EXERCISE THERAPY</b>						
-----	80-----	20-----	100	80 -----	20 -----	100
<b>FUNDAMENTALS OF ELECTRO THERAPY</b>						
-----	80-----	20-----	100	80 -----	20 -----	100