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

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 com0000000000ponents 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
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
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 Appralus 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)- EXCRETARY 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** 
   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** 
   i) Effects of acute & chronic exercises;  
   ii) oxygen / CO2 transport-O2 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** 
   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
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---------------------------------------- 15 marks
[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)

<table>
<thead>
<tr>
<th>SN</th>
<th>Topic</th>
<th>No. of Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>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 &amp; lipid metabolism.</td>
<td>08</td>
</tr>
<tr>
<td>02</td>
<td>PROTEINS :- Definition, Importance, Functional, Classification Digestion &amp; Absorption, decarboxylation, deamination, transamination, transmethylation, Urea cycle, clinical significance of serum urea, function of glycine, Phenylalanine, tryptophan, methionine tyrosine.</td>
<td>04</td>
</tr>
<tr>
<td>03</td>
<td>ENZYMES :- Definition, Modern Classification, Factors affecting enzymes Action, diagnostic &amp; therapeutics uses &amp; enzymes, iso-Enzymes, competitive &amp; Non competitive inhibition.</td>
<td>04</td>
</tr>
<tr>
<td>04</td>
<td>VITAMINS :- Definition, Classification, Fat &amp; water soluble vitamins, functions, Deficiency manifestations sources &amp; RDA</td>
<td>03</td>
</tr>
<tr>
<td>05</td>
<td>MINERALS :- Ca, P, Fe, I, Zinc, Selenium, Fluorine, Magnesium, Function sources, Deficiency manifestations</td>
<td>03</td>
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<tr>
<td>06</td>
<td>HORMONES :- Definition with mechanism of action, classification</td>
<td>01</td>
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<tr>
<td>07</td>
<td>NUTRITION :- Composition of food, balanced diet, kwashiorkor, marasmus, nitrogen balance, major dietary constituent &amp; they importance</td>
<td>03</td>
</tr>
<tr>
<td>08</td>
<td>Clinical Biochemistry : Liver function test, Renal function test, Lipid profile in serum</td>
<td>03</td>
</tr>
<tr>
<td>09</td>
<td>LIPID :- Definition, classification with examples, biomedical importance, Phospholipid &amp; lipoproteins functions. Digestion &amp; absorption of lipid B – oxidation of fatty acid with energetic, Ketone bodies and their &amp; metabolism, cholesterol, importance of cholesterol, obesity.</td>
<td>04</td>
</tr>
<tr>
<td>10</td>
<td>Muscle Contraction :- Mechanism &amp; Biochemical, events Connective Tissue- Biochemistry of connective tissue-collagen-Glyco-protein-proteoglycans</td>
<td>02</td>
</tr>
<tr>
<td>11</td>
<td>NUCLEIC ACID :- Function of DNA, RNA, genetic code specialized products of amino acids phenylalanine,tryptophan, glycine, methionine. Transmionation, deamination and urea cycle (protein)</td>
<td>02</td>
</tr>
<tr>
<td>12</td>
<td>Clinical Significance of some importance biochemical constituents in serum in various diseases.</td>
<td>03</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>40</strong></td>
</tr>
</tbody>
</table>
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 (24th edition) by Harpar
Biochemistry (2nd 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] ------- 15 marks
Section C-Q3) LAQ To attempt any THREE out of Four answers [3 x5] ------- 15 marks

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

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:


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,


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.


11] Principles of Yoga & basic ten Yogic postures & their physiological effects Yogic postures.


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


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

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, & ultrasound
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


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 – 3rd & 10th ed,
2. Electro therapy explained – by Low & Read
3. Electro Therapy – by Kahn
4. Basics of Electrotherapy – Dr. Subhash Khatri

REFERENCE BOOK –
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
* 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 1st B.P.Th

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