DPU
Dr. D. Y. PATIL VIDYAPEETH, PUNE
(DEEMED UNIVERSITY)

Syllabus for Bachelor of Physiotherapy (BPT)

2014-15
THEORY EXAMINATION:-

1. For any Theory paper, 20% of the total marks allotted to the entire paper and / or individual sections of the paper shall be allotted to Internal Assessment (I.A) of the entire paper or its individual section, whichever case may be.
2. Evaluation of Theory & Internal Assessment shall be under a separate heads of passing.
3. Board of paper setters – There shall be minimum TWO paper setters per paper / per section if the paper includes different subjects [e.g.- subject “Pathology & Microbiology” of II BPT course includes, subjects- Pathology & Microbiology]. Each one of them shall set TWO sets of question papers independently & send them in a sealed envelop directly to the C.O.E., Dr. D. Y. Patil Vidyapeeth.

➢ Qualification of paper setter- Preferably Masters Degree in respective Professional course with minimum THREE years full time teaching experience

OR

➢ Dr. D. Y. Patil Vidyapeeth recognized teacher holding Degree in the respective professional course with minimum 5 years full time teaching experience [Such Rules shall be relaxed to Two years full time teaching experience If the candidate has more than Ten years full time Clinical experience at a recognized teaching institute]

4. Instructions to paper setters –

a. The paper shall cover the entire syllabus of the subject & avoid setting questions based on the Psycho-motor domain.
b. Instructions, if any, shall be stated in bold letters-e.g.-“Draw neat diagram”.
c. The paper shall be in three sections, & each section shall be attempted in a separate answer book.
d. The paper setter shall provide a KEY for EACH question
e. For the Paper carrying 80 & 40 marks respectively, Section-A shall be of 20 & 10 minutes respectively, & Section B & C shall be of 2 hrs 40 min & 1hr 50 min respectively.
5. **Moderator**- There shall be One moderator per paper, who shall study all the sets & ensure that the script is legible, covers over all topics of the respective syllabus, does not include any question, which is repeated or outside the syllabus. If so then he/she shall rectify the errors in the manuscript & seal all the sets again & submit them to the C.O.E. Confidentiality of the papers shall be the joint responsibility of the paper setters & Moderator.

6. a) **Qualification of Moderator** – Masters Degree in the respective professional Degree course, with minimum Five years full time teaching experience

   OR

   Dr. D. Y. Patil Vidyapeeth recognized teacher holding Degree in respective professional Degree course with minimum Eight years full time teaching experience.

7. **Age of the paper setter/ Moderator**- should not be above 65 years

8. **Examiner**- Paper setter can be appointed as examiner – qualification shall be same as paper setter.

9. Each Examiner shall evaluate NOT MORE THAN 80 papers / day.

**PRACTICAL / CLINICAL EXAMINATION**

1. **Panel of Examiners**

   - There shall be minimum TWO examiners per Practical/ Clinical [as per the type of discipline of individual section if the paper includes more than one subject] examination having one Internal & One external examiner. Internal examiner shall be the Co-ordinator of the examination.
   - Both the examiners shall jointly plan the overall conduct of examination prior to its commencement & conduct the ENTIRE examination together.
2. **Selection criteria of examiners.**

- For any Practical/clinical examination, Appointment of the Internal Examiner shall be done by the Controller of examination.
- Qualification of the examiner shall be same as the paper setter.
- The Controller of examination shall provide, the names of Internal & external examiners to the principal of the college. The principal can select the substitute examiner from the list provided with the concurrence of the COE. However the Principal/COE shall NOT select any examiner working in the SAME institute as a substitute for the External examiner.

3. **Number of candidates to be evaluated per day** - There shall be NOT MORE THAN 20 candidates evaluated per day for any NON-CLINICAL /PRACTICAL examination & NOT MORE THAN 15 candidates evaluated per day for CLINICAL examination.

4. **Pattern of Examination** - The pattern shall be according to the need of the particular subject. The Convenor shall take care that maximum syllabus shall be covered in the Practical /Clinical Examination. It is recommended to include Viva &O.S.P.E., / O.S C. E. methods in the exam.

5. **Conduct of Practical /Clinical examination** - Before the assessment of the candidate, both the examiners shall jointly prepare arbitrary questions & marks for each such question as per the total marks granted to each experiment & accordingly evaluate the candidate - e. g - Max 40 marks granted to a Long Case shall be distributed as

- Ability of History taking - 10 marks,
- Ability of psychomotor & affective skill of evaluation - 10 marks
- Ability of appropriate Diagnosis - 10 marks
- Ability of planning /prescription of appropriate treatment with an ability of Clinical reasoning-10 marks. Such allotment of marks shall be documented on the Practical /Clinical answer book before sealing such answer books.
INTERNAL ASSESSMENT-[I.A.]

1. I.A. in THEORY
   - Average of the Total marks granted to a Theory paper, shall be allotted to I.A.
     - There shall be total TWO examinations, one terminal & one preliminary examination respectively per paper. The Preliminary examination shall be based on University examination pattern.
   - Average marks of two such assessments shall be considered for I.A.
     ✓ In case a Paper includes more than one section/subject, then I.A. in each such section/subject could be considered for the overall I.A. for that particular paper.

2. I.A. PRACTICAL /CLINICAL
   - Average of the Total marks allotted to any Practical/Cl inical examination shall be considered for I.A. Such I.A. shall be conducted as ward exam, periodicals / experiment / completion of jobs etc, [as per the requirement of individual syllabus] minimum TWO times during the respective academic year & an average total marks that include all such tests shall be considered for I.A. of that particular paper.
     ✓ In case any Practical/ Clinical includes more than one section/subject, then at least one I.A in each subject/section should be conducted (total of such I.A. included in the paper should be minimum 4) & the average of the total marks to be considered for I.A.

3. In case if need is felt for any clinical examination, in any Medical subject which includes only Theory paper, at the university examination, the I.A. in that particular paper can include both Theory as well as Ward examination having minimum two such tests in total & average of total Marks obtained may be considered for IA.
COLLEGE EXAMINATION-
1. College examination –in Theory/ Practical / Clinical / Project etc for any Allied subject as per the requirement of the respective syllabus shall be conducted in the FIRST TERM of the respective academic year. Such examination shall follow the same pattern of the university examination, in Theory/Practical/project etc, except the appointment of an External examiner.

2. Total Marks granted for Each of such examination shall be converted into Grade as follows-

<table>
<thead>
<tr>
<th>Marks</th>
<th>Description</th>
<th>Grade</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>75 % &amp; above</td>
<td>Excellent</td>
<td>A+</td>
<td></td>
</tr>
<tr>
<td>66-74 %</td>
<td>Very Good</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>51-65 %</td>
<td>Good</td>
<td>B+</td>
<td></td>
</tr>
<tr>
<td>50 %</td>
<td>Satisfactory</td>
<td>B [min. required for passing]</td>
<td></td>
</tr>
<tr>
<td>41-49 %</td>
<td>Below average</td>
<td>C [Fail]</td>
<td></td>
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</tbody>
</table>

3. Passing in EACH College examination shall be a pre-requisite for admission at the respective university examination. Grade of the college examination shall be submitted to the university along with I.A. marks.

BPT COLLEGE & UNIVERSITY EXAMINATION SCHEDULES

A) FOR REGULAR BATCH
1. Terminal Examination :- December 2\textsuperscript{nd} week to 4\textsuperscript{th} week
2. Preliminary Examination :- April 1\textsuperscript{st} week to 3\textsuperscript{rd} week
3. University examination :- June / July

B) FOR ODD BATCH
1. Terminal Examination :- July 1\textsuperscript{st} week to 3\textsuperscript{rd} week
2. Preliminary Examination :- October 1\textsuperscript{st} week to 3\textsuperscript{rd} week
3. University examination :- Nov / Dec
Preamble:

The Bachelor of Physiotherapy course has been proposed as a 4-year and 6 months fulltime program including 6 months internship leading to degree that equips the student with analytical, hands-on skills. The program is generic in nature and has a component of additional learning of one area leading to another area. Psychosomatic aspects of training are a component through all the areas.

Nomenclature

The course will be referred to as a Bachelor of Physiotherapy (BPT).

Faculty/Student

The teacher: student ratio should be such that the number of teachers to the number of students admitted per year is 1:5.

Attendance

A student must have a minimum of 80% attendance to be eligible to take up the examinations.

Only those students who have pursued a regular prescribed course of study for the year will be allowed to appear in the University Examinations that are held at the end of their respective years.

Examinations and Assessment

The examination for the BPT degree will consist of both formative and summative pattern: Written assignment as required or stipulated by the teacher, Clinical, oral, and practical examinations as the case maybe. Internal assessment at specified intervals during the course of the academic year will be carried out on an ongoing basis. Student should pass in the Internal Assessment exams with 35 % to appear for the University examinations. Continuous clinical assessment will be carried out though out the year.
Criteria for Passing University examination

To pass the University Examination,

1. A candidate must pass in two heads of passing i.e. Theory and Practical separately at the same time.
2. In the Theory Examination the Candidate must obtain 50% of the total Marks to pass theory examination irrespective of the parts.
3. To pass in practical exam, candidate must obtain 50% of total marks to pass practical exam.
4. A candidate must obtain an aggregate of 50% to pass in the respective subject(s).

Rules for ATKT

The candidate shall be promoted to subsequent year (from I year to II year, II year to III year, III year to IV year) even if he/she fails in one or two subjects in the current year of study. However, he/she must pass in these subjects within six months. To appear for subsequent examinations he/she must pass in all subjects of the previous year. A candidate failing in more than two subjects will not be permitted to proceed to next class. It is mandatory for the candidate to pass in all subjects of IV year to be eligible for internship program.

Rules for Grace marks

The grace marks up to a maximum of five may be awarded to a student who has failed only in one subject but has passed in all other subjects. These five marks shall be distributed in different heads of passing of that subject. Provided that these grace marks shall be awarded only if the student passes after awarding these marks. (Refer clause 59, Bye-laws of Dr.D.Y.PatilVidyapeeth).
Student – Guide Ratio
Guide student ratio shall be 1: 5.
Syllabus & Scheme of Examinations
I - BPT

BPT

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Total hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction to Physiotherapy</td>
<td>10 hrs</td>
</tr>
<tr>
<td>2. Human Anatomy</td>
<td>235 hrs</td>
</tr>
<tr>
<td>3. Human Physiology</td>
<td>210 hrs</td>
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<tr>
<td>4. Biochemistry</td>
<td>50 hrs</td>
</tr>
<tr>
<td>5. Exercise Therapy I</td>
<td>235 hrs</td>
</tr>
<tr>
<td>6. Electro Therapy I</td>
<td>200 hrs</td>
</tr>
<tr>
<td>7. English</td>
<td>20 hrs</td>
</tr>
<tr>
<td>8. Computer Science</td>
<td>20 hrs</td>
</tr>
<tr>
<td>9. Supervised clinical Training</td>
<td>440 hrs</td>
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</tbody>
</table>

* First year college exam Theory only
** First year college exam Practical only

Clinical assignments should include Observation with 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. 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 [10hrs]

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

1. Acquire the geographical orientation of the various concerned sections 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.
HUMAN ANATOMY---- [235 HRS]

Didactic—105 Hrs                             Practical /Laboratory-130 Hrs

Goal - To provide the student with the necessary anatomical knowledge & skills to practice as a qualified Physiotherapist.

Objectives-

1. MUSCULO- SKELETAL
   a) The student should be able to identify and describe anatomical aspects of muscle, bones & joints, & to understand and analyze movements
   b) To understand the anatomical basis of various clinical conditions e.g. Trauma, deformities, pertaining to limbs & spine.
   c) To be able to localize various surface landmarks;

2. NEURO ANATOMY
   a) To identify and describe various parts of Central Nervous System (C.N.S) - Fore-brain, Midbrain, Hind-brain, Brain stem, courses of cranial nerves; functional components - course distribution- Anatomical bases of clinical lesions ;
   b) To describe the source and course of spinal tracts;
   c) To describe blood circulation of C.N.S. & spine;
   d) Be able to identify the components of various Trans-sections.

3. THORAX
   a) To identify and describe various components and contents of the Thorax- with special emphasis to tracheo-bronchial tree, & cardio- pulmonary system.

4. CIRCULATORY
   a) Be able to identify and describe the source, course of major arterial, venous and lymphatic system, with special emphasis to extremities, Spine and Thorax.
5. PSYCHO-MOTOR.
   To be able to
   a) Demonstrate the movements of various joints.
   b) Distinguish cranial & peripheral nerves
   c) Distinguish major arteries, veins and Lymphatic with special emphases to extremities and spine.

Syllabus-
General Introduction: Section I (10 hrs)
1. Histology-Cell, tissues of the body, epithelium, connective tissue, cartilage, bone, lymph, muscle, nerve etc.
2. Osteology- Formation, function, growth and repair of bones.
3. General Embryology-Ovum, spermatozoas, fertilization, differentiation, development of various systems and foetal circulation.

Section-II (Total 40 hrs)
Systems of Human body (a brief Outline):
1. Cardio Vascular System –Arteries, capillaries, veins, heart, lymphatic system. (10hrs)
2. Respiratory System –Anatomy of upper and lower respiratory tract including nose, larynx, trachea, bronchi, pleura and lungs. (6hrs)
3. Urogenital System –Anatomy of Urinary system, male and female reproductive system (special emphasis to female system). (9hrs)
4. Axial skeleton (2hrs)
5. Sensory Organs (8 hrs)

Desirable to know (5hrs)
. Digestive System –Anatomy of the gastro-intestinal tract.

Section-III
Neuro-anatomy: (45hrs)
1. Peripheral Nerves
2. Neuromuscular Junction
3. Sensory End Organs
4. Spinal Cord Segments & Areas
Section-IV
UPPER EXTREMITY (40hrs)

• Osteology
  – Outline the anatomical features, attachments, ossification and side determination of the bones of U/L: Clavicle, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges

• Myology
  – Fascia and Muscles of front and back of upper arm: origin, insertion, nerve supply and action.
  – Muscles of front and back of forearm: origin, insertion, nerve supply and action.
  – Mention the small muscles of hand with their origin, insertion, nerve supply and action.
  – Identify the nerves of upper limb and mention their position course, relations and distribution.
– Detail explanation of joints of upper limb: shoulder guide, Shoulder joint, Elbow, Wrist and joints of hand.
– Indicate the blood vessels of upper limb and mention their position course, relations, distribution and main branches.
– Lymphatic damage of upper limb
– Applied anatomy of all structures of U/L

Section – V
TRUNK-THORAX & ABDOMEN (15 hrs)

• Osteology
  – Vertebral columns: Identify the parts of typical vertebra and state the main features, attachments and ossification.
  – Intervertebral disc and mention its part.
  – Ribs: Parts and main features of typical rib and define true, false and floating ribs.
  – Sternum: State the parts and anatomical features.

• Myology
  – Fascia and muscles of back
  – Fascia and muscles connecting U/L with vertebral column: origin, insertion, nerve supply, action.
  – Intercostal muscles and diaphragm: origin, insertion, nerve supply and action.
  – List layers of anterior Abdominal wall and mention its origin, insertion, nerve supply and action of these muscles.
  – Fascia and muscles of post Abdominal Wall: origin, insertion, nerve supply and action.

• Joints of Thorax
  Identify the various joints and explain in detail:
  – Manubriosternal joint
  – Costo vertebral joint
  – Costo transverse joint
  – CostoChondral joint
  – Chondro sternal joints
  – Inter vertebral joint
  – Movements of vertebral column
  – Respiratory movements
• Mention the course and branches and nerves, blood vessels and lymphatic drainage of trunk-thorax-abdomen.
• Lumbar Plexus: Position, formation and branches.
• Rectus sheath: formation and contents.
• Contents of vertebral canal
• Intercostal space and its contents
• Diaphragm-structures passing through it.
• Applied Anatomy of structures of trunk – thorax - abdomen

Section – VI
PELVIS (15 hrs)
• Features of pubic symphysis and sacroiliac joints.
• Muscles of pelvic floor and mention their attachments, action and nerve supply.
• Difference between male and female pelvis.
• Main features of subdivision, boundaries, walls and floor of pelvis.
• Urogenital diaphragm (outlines only)
  – Applied anatomy of lumbar plexus
  – Lymphatic drainage
  – Nerve supply
  – Sacral Plexus
  – Mention the blood vessels of the region with course, variations, distribution and main branches.

Section – VII
LOWER EXTREMITY (35hrs)

• Osteology
  – Hip bone, femur, Tibia, Fibula, Patella, and bones of the foot

• Myology-, Origin, Insertion, Nerve Supply, Action of the following:
  – Fascia and muscles in anterior of thigh
  – Fascia and muscles of medial side of thigh
  – Fascia and muscles of posterior of thigh
  – Fascia and muscles of gluteal region
  – Fascia and muscles of front of leg and dorsum of foot
  – Fascia and muscles of lateral side of leg
  – Fascia and muscles of back of leg and sole of foot
– Detailed explanation of joints of Lower Limb: Pelvic Girdle, Hip, joint, Knee joint, Ankle joint, joints of foot.
– Identify the nerves of Lower Limb and mention their position course, relations distribution
– Indicate the blood vessels of Lower Limb a mention their position course, relation, distribution and main branches
– Lymphatic drainage of Lower Limb
– Explain femoral triangle and subsartorial canal
– Popliteal fossa
– Anatomy of structures of Lower Limb

Section VIII
HEAD, NECK AND FACE (special emphasis on myology and osteology) (25hrs)
(Must Know)
• Muscles & Vessels of neck
• Facial muscles & orbit.
• Temporo-Mandibular (T.M) joint, cervical vertebrae & Skull.
• Endocrine glands.
• Cranial nerves,

(Desirable to know)
• Triangles of neck
• Lateral wall of nose
• Larynx, Pharynx
• Salivary glands

Section-XI (10hrs)
Radiological Anatomy: Radiographic appearance of Musculo-skeletal system of Upper limb, Lower limb, Spine.
Surface Anatomy
a) Bony landmarks of HNF, upper extremity, lower extremity, spine
b) Demonstration of muscles – HNF, superior extremity, inferior extremity
c) Demonstration of movements of joints
d) Palpation of peripheral arteries & nerves
1. Williams & Warwick, Gray’s Anatomy-Churchill Livingstone.
2. Inderbir Singh, Textbook of Anatomy with colour Atlas-Vol. 1, 2, 3 Jaypee Brothers
3. B.D. Chaurasia, Human Anatomy-Volume 1, 2, 3 CBS Publishers & Distributors.
4. Mcminn’s Last’s Anatomy-Regional and applied, Churchill Livingstone.
8. Snell-Clinical Anatomy-Lippincott

REFERENCE BOOKS

1. Gray’s Anatomy
2. Extremities by Quining Wasb
3. Anatomy & Physiology by Smout and McDowell
4. Kinesiology by Katherine Wells [sounders co.]

SCHEME OF EXAMINATION

1. THEORY- 80 MARKS + Internal assessment-20 marks
   TOTAL -100MARKS

Model question paper

Section A

Q 1] M.C.Q.-Based on Single best response – [20 x 1] 20marks
   [20 minutes]
   (This question should include all the MUST KNOW questions)
Section B

• S.A.Q. -

• Q.2)-Answer any Five out of Six [3 X 5]---------------------15 marks

This question should include:
1. Digestive system
2. Uro-genital system
3. Reproductive system
4. Special senses - eye/ear/skin
5. Cardiovascular system

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

This question should include:
1. soft parts - Pelvis
2. soft parts - upper extremity
3. soft parts - lower extremity
4. soft parts - Trunk / neck

Section C

• L.A.Q-

Q-4] Based on Musculo Skeletal system -15 marks
Q-5] Based on Neuro-Anatomy [including cranial nerves with Emphasis to V, VII, VIII, IX & XII nerves]
[OR] -15 marks
Q-5] --------------------------do-----------------------------
2. PRACTICAL  

1. 20 Spots (2 Minutes per spot and 2 marks per spot)  
(20 X 2 = 40 marks)  

   a) 5 Spots based on Urogenital / Reproductive/special senses/Cardiovascular system  
      5 X 2 = 10  

   b) 5 Spots based on Soft part of Trunk/neck/ upper extremity / lower extremity/Pelvis  
      5 X 2 = 10  

   c) 5 Spots based on Musculoskeletal system  
      5 X 2 = 10  

   d) 5 Spots based on Neuro Anatomy  
      5 X 2 = 10  

2. Viva  
   a. Soft parts  
      (15 marks)  
   b. Osteology  
      (10 marks)  
   c. Surface Anatomy - Demonstration  
      (10 marks)  

3. Journal  
      (5 marks)  

HUMAN PHYSIOLOGY ------ [210 HRS]  

DIDACTIC-110 Hrs  PRACTICAL /LABORATORY-100 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 uro-genital function, and alterations in function with aging.  
3. Analyze physiological responses & adaptation to environmental stresses- with special emphasis on physical activity & temperature.  
4. Acquire the skill of basic clinical examination, with special emphasis to Peripheral and Central Nervous system, Cardiovascular and Respiratory system, & Exercise tolerance/Ergography.
Syllabus

General Physiology (4hrs.)
Must know
- The cell & cell organelles – structure & functions
- Homeostasis, biofeedback mechanisms
- Transport across cell membrane
- Outline of membrane potential & action potential

Nerve muscle (10 hrs.)
Must know
- Muscle –classification, structure, sarcomere & properties of muscles
- Myoneural junction & transmission
- Molecular basis of muscle contraction
- Motor unit, EMG
- Structure, Properties & Classification of nerves
- Propagation of nerve impulse.
- Degeneration and regeneration of nerve.

Desirable to know
- Applied aspects – Myasthenia gravis, Rigor mortis
- Reaction of degeneration
- Muscle disorders

Haematology (6hrs.)

Must know
- Composition and functions of blood
- Red blood cell – morphology, formation, normal count, functions, physiological and pathological variation.
- White blood cell – morphology, classification, properties, functions, physiological & pathological variation
- Haemoglobin – basic chemistry, fate and functions.
- Immunity – definition, classification, concept of antigen & antibody
- Haemostasis – steps, role of platelets
- Blood groups – A,B,O,AB and Rh system
- Anemias, ESR & PCV
Desirable to know
- Plasma proteins
- Anticoagulants
- Blood transfusion

Nice to know
- Haemophilia
- Thrombocytopenia

Cardiovascular system (16hrs)

Must know
- General organization and properties of cardiac muscle
- Origin and conduction of cardiac impulse
- Cardiac cycle and heart sounds
- Normal heart rate, bradycardia, tachycardia
- Normal ECG
- Cardiac output- normal values, physiological variations, factors affecting cardiac output and regulation
- Blood pressure – normal values, measurement, determinants, short term and long term regulation
- Regional circulation- Coronary, muscular, cerebral
- Functions of Lymph
- Pressure and volume changes during cardiac cycle

Desirable to know
- Patho-physiology of circulatory shock and edema
- Hypertension, hypotension

Nice to know
- Hemodynamic

Respiratory system (12 hrs)

Must know
- General organization of respiratory system
- Diffusion of gases
• Transport of respiratory gases
• Regulation of respiration
• Outline of hypoxia (types & physiological changes)
• Acclimatization to high altitude.
• Dead space, Ventilation/ perfusion ratio
• Maximum breathing capacity & breathing reserve
• Pulmonary function tests.

Desirable to know
• Artificial respiration

Nice to know
• Asphyxia, cyanosis (types and physiological changes)

Digestive System (5hrs)

Must know
• General organization
• Mastication and deglutition
• Saliva – composition, functions and regulation of salivary secretion
• Gastric secretion – composition, mechanism, phases of secretion, regulation and functions.
• Outline of gastric emptying and peristalsis
• Pancreatic secretion – composition, regulation and functions.
• Liver and gall bladder – composition and functions of bile
• Movements and functions of small and large intestine,
• Defecation reflex, constipation, diarrhea

Nice to know
• Jaundice
• Peptic ulcer

Renal Physiology (5hrs)

Must know
• General introduction, structure and functions of kidney
• Formation of urine- filtration, reabsorption and secretion
• Physiology of micturation
Desirable to know
- Renal circulation
- Plasma clearance test

Nice to know
- Neurogenic bladder
- Automatic bladder

Body Temperature regulation  (2hrs)

Must know
- Normal body temperature & its regulation
- Hypothermia, hyperthermia
- Skin-structure and functions

Endocrine system  (7hrs)

Must know
- Introduction - General organization of endocrine glands
- Releasing hormones from hypothalamus
- Anterior & Posterior pituitary hormones – physiological actions, regulation & disorders
- Thyroid Hormones – physiological actions, regulation & disorders
- Parathyroid Hormones — physiological actions, regulation & disorders
- Adrenal cortex & medulla– physiological actions, regulation & disorders
- Pancreatic hormones – physiological actions, regulation & disorders
- Mechanism of hormone action

Reproductive System  (8 hrs)

Must know
- Functional anatomy of reproductive system
- Puberty, changes in males and females, menarche, menopause
- Spermatogenesis - stages and regulation, Physiological actions of testosterone
Menstrual cycle and ovarian cycles – phases and hormonal regulation, ovulation
Physiology of pregnancy
lactation – initiation, maintenance and control,
Functions of placenta

Desirable to know
Pregnancy tests

Nice to know
Sex chromosomes
Precocious and delayed puberty

Central Nervous System (30hrs)

Must know
General organization of nervous system
Receptors – definition, classification and functions
Synapse – definition, physiological anatomy, synaptic transmission
Reflexes – classification, properties and functions
Spinal cord – ascending and descending tract and functions
Ascending tracts – sensations carried, pathways and functions
Descending tract – Origin, course and termination and functions
Pain sensation – types of pain, pathways for conduction of pain, referred pain, central analgesia system
Posture & equilibrium, Vestibular apparatus
Thalamus – Functions
Hypothalamus – functions
Cerebellum – functions, effects of lesion
Basal ganglia – functions, effects of lesion, Parkinsonism
Muscle tone
Cerebral cortex – Gross anatomy and division, functions of each lobe
Autonomic nervous system – Organization & functions of parasympathetic, sympathetic system and functions
• CSF – Composition, formation, circulation, functions & Blood brain barrier- Applied aspects
• Differences between Upper Motor Neuron and Lower Motor Neuron lesions

Desirable to know
• Synthesis of neurotransmitters
• Limbic system and its functions

Nice to know
• Effects of spinal transection
• Decerebrate and decorticate rigidity
• Thalamic syndrome
• Ascending and descending reticular activating system
• Speech, memory and learning,

Special Senses (5hrs.)

Vision
Must know
• Vision – Structure of eye ball, retina, refractory errors,
• Accommodation, visual pathway, Pupillary reflexes

Desirable to know
• Light and dark adaptation
• Photochemistry of vision

Ear
Must know
• Functional anatomy of ear
• Functions of middle ear, Functional anatomy of cochlea & functions of inner ear

Desirable to know
• Audiometry
• Auditory pathway

Nice to know
• Physics of sound
• Theories of hearing
Taste & smell

Must know

- Functional anatomy, factor affecting.

**TEXT BOOKS**

1. Text book on Medical Physiology-By Guyton
3. Concise Medical Physiology – Sujit K. Chowdhuri

**REFERENCE BOOKS**

3. Textbook of Medical Physiology – Indu Khurana

**SYLLABUS:HUMAN PHYSIOLOGY**

Lecture demonstrations &Practicals(L.Ds)

I - BPT

A) LECTURE DEMONSTRATION (50hrs.)

1) Haematology: (10hrs.)
   Hb, RBC, WBC ,Blood groups, BT & CT.

2) Graphs: Properties of muscles (20hrs.)
   a) Skeletal muscle
      SMC, effect of temperature, velocity of nerve conduction, fatigue, tetanus, all or none law & effect of load.
   b) Cardiac muscle
      Normal cardiogram, effect of speed, temperature, Stannius ligature, all or none law & incomplete tetanus, Nervous regulation of heart, vagal escape. Effect of drugs (adrenaline & acetylcholine)
3) Other L. Ds. (20hrs)
   a) Physical fitness- Cardiopulmonary efficiency tests
   b) Stethography
   c) Spirometry
   d) Ergography
   e) Perimetry
   f) ECG

B) PRACTICALS (CLINICAL PHYSIOLOGY) (50hrs.)
   a) Clinical examination of arterial pulse.
   b) Determination of arterial blood pressure.
   c) Clinical examination of cardiovascular system.
   d) Clinical examination of respiratory system.
   e) Clinical examination of higher functions.
   f) Clinical examination of sensory system.
   g) Clinical examination of motor system –I.
   h) Clinical examination of motor system –II.
   i) Clinical examination of all cranial nerves.

SCHEME OF EXAMINATION
THEORY - 80 MARKS + INTERNAL ASSESSMENT –20 MARKS=
100MARKS

Model question paper

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
   a) Blood,
   b) Digestive system
   c) Endocrine
   d) Reproductive system
   e) Special senses
Q- 3) Answer any Three out of four – (3 X 5) -------------------15 marks

**Should include**

a) Cardio-vascular system  
b) Respiratory system  
c) Exercise physiology  
d) Excretory system

**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 – 5] --------------------------------do-----------------------------------15marks

(LAQ should give break - up of 15 marks in the form of sub question a, b & c)

**Practical – (80 Marks)**

1) **Spots (Rotatary)**  

2 minutes per spot (2 X 10 = 20 marks)

10 Spots based on

- Haematology- 1  
- Graphs-2  
- Physical fitness-1  
- BP/ ECG/HR-2  
- Spirometry- 1  
- Ergography/Stethography-1  
- Perimetry-1  
- Endocrine-1

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2) Clinical physiology (Two question slips) (30 marks)

- Respiration – clinical examination of respiratory system
- CVS- pulse B.P. clinical examination of CVS
- Cranial nerves
- Reflexes
- Motor and Sensory system.

3) Viva (25 marks)

Based on Theory portion

Viva I (12 marks)
- Nervous system
- Special senses
- Nerve physiology
- Muscle physiology

Viva II (13 marks)
- CVS
- RS
- Exercise physiology
- Endocrine, Reproductive
- Excretory, Temp. regulation
- Digestive system

4) Journal (5 marks)

BIOCHEMISTRY------------------ [50 hrs - Didactic only]

Objectives- at the end of the course, the candidate will –

1. Be able to describe structures & functions of cell in brief.
2. Be able to describe normal functions of different components of food, Enzymes,
3. Define Basal metabolic rate & factors affecting the same [in brief], with special reference to obesity.
4. Be able to discuss nutritional aspects of carbohydrates, lipids, proteins & vitamins & their metabolism with special reference to obesity.
5. Define enzymes; discuss in brief, factors affecting enzyme activity.
6. Describe in details biochemical aspects of muscle contraction.
SYLLABUS

1. CELL BIOLOGY (1 hr)
   Must Know
   • Membrane, structure & function
   • Junction of intracellular organelle in brief- [no structural details needed]

2. CARBOHYDRATES (7 hrs)
   Must Know
   • Metabolism-Digestion and absorption of carbohydrates, Glycolysis- aerobic, anaerobic & its regulation
   • Kreb’s cycle & its regulation
   • Glycogenesis, glycogenolysis & their regulation, role of liver in muscle glycogen
   • Glyconeogenesis, significance of H.M.P. shunt
   • Hormonal regulation of blood sugar levels, Important metabolic disorders of glycogen, lactose intolerance, Diabetes mellitus.
   • Clinical biochemistry: Relevance of blood levels of glucose, Glycosuria

3. PROTEINS (7 hrs)
   Must Know
   • Chemistry-definition-function-classification of Amino acids-protein structure-effect of temperature on proteins-denaturation-coagulation; isoelectric pH & its importance
   • Metabolism-Digestion and absorption- Decarboxylation- Deamination- Transmethylation-transamination & their importance-Detoxification of ammonia including urea cycle.
   • Clinical biochemistry: Relevance of blood levels of, urea, & uric acid, Protein in urine

4. LIPIDS (6 hrs)
   Must Know
   • Chemistry-definition-classification-[including fatty acids with examples]-function
   • Metabolism-Digestion and absorption of lipids—β oxidation of saturated fatty acids and its energetics and regulation of fat metabolism in adipose tissue- Ketone bodies formation &
- Clinical Biochemistry - Lipid profile-Tri-glyceride, cholesterol/HDL/LDL/VLDL etc, Liver function test & Renal function test

**Nice to Know**
- Phospholipid synthesis

**5. NUCLEIC ACIDS**

**Desirable to Know**
- D.N.A. /R.N.A.-definition-structure and function-types-
  Genetic code-catabolism of purine –gout

**6. ENZYMES**

**Must Know**
- Definition-Co-Enzymes, modern classification, factors affecting enzymes action
- Iso-enzymes
- Clinical and therapeutic use of enzymes:
- Clinical relevance: Enzymes-Amylase, CPK, LDH, isoenzymes

**Desirable to Know**
- Inhibition and types of inhibitors

**7. VITAMINS**

**Must Know**
- Water and fat soluble-definition-classification
- Individual vitamins-sources-Co-enzyme forms- function
- RDA, absorption and transport-deficiency and toxicity

**8. BIOLOGICAL OXIDATION**

**Desirable to Know**
- Oxidative phosphorylation & ETC in brief.
9. MINERALS (4 hrs)

Must Know
- Phosphate, calcium and iron [in detail]
- Magnesium, Flouride, Zinc, Copper, Selenium Molybdenum, Iodine-sources, absorption, transport-excretion, functions and deficiency
- Clinical Biochemistry-Relevance of blood levels of Ca, phosphate & Iron

10. ACID – BASE BALANCE, WATER & ELECTROLYTE (4 hrs)

Must Know
- Body water, pH-osmolarity Extra and Intra cellular fluid.
- Buffers-pH, buffer system in blood.
- Role of kidneys & lungs in acid-base balance.
- Water- electrolyte balance - imbalance-dehydration.

11. MUSCLE CONTRACTION (2 hrs)

Must Know
- Contractile elements
- Biochemical events during contraction
- Energy metabolism in skeletal & cardiac muscle

12. CONNECTIVE TISSUE (2 hrs)

Must Know
- Biochemistry of connective tissue-collagen – Glyco-protein – proteoglycans

13. NUTRITION (3 hrs)

Must Know
- Importance of nutrition
- Basal metabolic rate – definition – normal values-factors affecting BMR
• energy requirement with – age/sex/ thermogenesis – specific dynamic action of food,-energy expenditure for various activities
• Composition of food, balanced Diet, dietary recommendations, nutritional supplementation – nutritional value of carbohydrates/proteins/fats & Fibers,
• Nitrogen balance & its significance, Protein energy malnutrition – Kwashiorkor & Marasmus

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/ Shrikumar

REFERENCE BOOKS


SCHEME OF EXAMINATION – [THEORY ONLY]
THEORY-40MARKS = INTERNAL ASSESSMENT – 10 MARKS
(There shall be No Long Answer Questions in this paper)

THEORY
Section – A
• MCQ
Q-1] Single best answer of MUST KNOW area – [10 x 1]
10 marks
*Section – B
Q-2-S.A.Q. - To answer any FIVE out of six [5 x 3]
15 marks
Q-3-S.A.Q. - To answer any THREE out of four [3 x 5]
15 marks
*(Emphasis should be given to Musculo - skeletal, Neural Biochemistry, Carbohydrates, Lipids, Proteins, Vitamins and Minerals)
EXERCISE THERAPY I - [200 + 35 = 235 hrs]

A [200 hrs.]

1. BASIC BIOMECHANICS-----------------------------didactic-40 hrs
2. BIO-PHYSICS APPLIED TO MOBILISATION/EXERCISE & HYDROTHERAPY--------didactic 30 hrs +practical/laboratory-50 hrs
3. MASSAGE----------------didactic- 5 hrs + practical /laboratory-25 hrs
4. BASIC EVALUATION---------------------------didactic-10 hrs + laboratory/practical-40 hrs

B [35 hrs.]

1. PHYSICAL FITNESS & YOGA--------didactic-10 hrs + laboratory/practical-25hrs

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

1. To define the various terms used in mechanics, Biomechanics and 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, and their efficacy in therapeutic gymnasium and various starting positions used in therapies.
3. To describe and 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 and derived positions.
6. Acquire the skill of application of various massage manipulations and describe the Physiological effects, therapeutic use, merits /demerits of the same.
7. Acquire a skill of assessment of sensations, superficial and deep reflexes, pulse rate/ Blood pressure, Chest expansion/respiratory rate, and limb length/girth measurement on Models.
8. To demonstrate and also acquire the skill of relaxation.
9. To describe types of Goniometer ,merits and demerits of goniometry and to demonstrate and acquire the skill of measuring ROM with goniometer
10. To describe the skill and usefulness of group and recreational activities and will be able to demonstrate general fitness exercises used in Physical Training.

11. Be able to define Yoga and its types, its physiological and Psycho-somatic effects and will be able to demonstrate standard yoga postures used by the beginners.

12. Be able to demonstrate, General Fitness exercises and shall gain fitness for self.

Syllabus

Total Didactic Hours 95 hours

Must Know
1. Basic Biomechanics
   a. Axis /planes, Newton’s law of motion, mechanics of Forces, levers, pendulum, equilibrium, Torque, stability, base of support, COG, law of gravity 19 hrs.
   b. Types of muscle work-angle of pull - Mechanical advantage- applied mechanics in the Therapeutic Gymnasium 7 hrs.
2. Starting and derived positions, 9 hrs.
3. Classification of movements (active, passive, assisted, resisted) 7 hrs.
4. Goniometry- principles, techniques, uses, types. 8 hrs.
5. Limb length (only lower limb - apparent, true, supratrochantric) and girth measurements. 4 hrs.
6. Assessment of Sensations / Reflex testing. 3 hrs.
7. Assessment of Blood pressure / pulse rate / chest expansion and Respiratory rate 3 hrs.

8. Relaxation- all methods.
   a) Describe relaxation, muscle fatigue, muscle spasm and tension (mental & physical).
   b) Factors contributing to fatigue & tension.
   c) Techniques of relaxation (local and general).
   d) Effects, uses & clinical application.
   e) Indication & contraindication. 5 hrs.

9. Massage manipulations-principles effects/merits/demerits - skills on extremities / scalp / spine/ abdomen / face.
   a) History, various types of soft tissue manipulation techniques.
b) Physiological effects of soft tissue manipulation on the following systems of the body: Circulatory, Nervous, Musculoskeletal, Excretory, Respiratory, Integumentary system and Metabolism.

c) Classify, define and describe: - effleurage, stroking, kneading, petrissage, deep friction, percussions, vibration and shaking etc.

d) Preparation of patient: Effects, uses, indications and contraindications of the above manipulation. 

10. Therapeutic Gymnastics:
   a) Setup of a gymnasium & its importance.
   b) Various equipment in the gymnasium.
   c) Operational skills, effects & uses of each equipment (shoulder wheel, finger ladder, therapeutic balls, parallel bars etc.)
   d) Suspension therapy, use of accessories such as pulleys, springs

11. Walking aids – Introduction, types, parts, measurement

12. Principles of Yoga & basic Yogic postures and their physiological effects.

Yogic postures:-

A] Supine Position
   1) Shavasana
   2) Halasana
   3) Sarvangasana
   4) Setubandhasana
   5) Pavanmuktasana

B] Prone Position
   1) Dhanurasana
   2) Salabhasana
   3) Bhujangasana
   4) Naukasana

C] Standing
   1) Padahastasana
   2) Trikonasana
   3) Utkatasana

D) Sitting
   1) Padmasana
   2) Siddhasana
3) Paschimottanasan
4) Yogamudrasana
5) Vajrasana
6) Gomukhasana

13. Hydrotherapy—physics-application-effects-merits /demerits **5 hrs.**
   - Basic principles of fluid mechanics, as they relate to hydrotherapy.
   - Physiological & therapeutic effects of hydrotherapy, including joint mobility muscle Strengthening & wound care etc.
   - Types of Hydrotherapy equipment, indications, contraindications, operation skills & patient preparation

**NICE TO KNOW**
1. Physiology and biophysical principles of stretching **1 hr**

2. Group & recreational activities—General fitness exercises – Warm up-stretching –mobility – strengthening – cool down **2 hrs.**

3. Basic principles of General fitness—warming up exercises, aerobics – cooling down exercises. **2 hrs.**

**PRACTICAL**
- Skills included in sr.no.2 to 12 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- Hollis
5. Suspension Therapy in Rehabilitation—Margaret Hollis
6. Biomechanics--Cynthia Norkins
7. Hydrotherapy - Duffield
8. Measurement of joint motion - Cynthia Norkins

**REFERENCE BOOKS**
1. Clinical Kinesiology - Brunnstroms
SCHEME OF EXAMINATION

THEORY-80 MARKS + INTERNAL ASSESSMENT- 20 MARKS

Section-A
- MCQ-Q
  Q – 1] Based on -Single best answer [20 x 1] 20marks
  (20 Min.)
  [It must include MUST KNOW Questions]

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
  Q-4] [Compulsory]—based on Biomechanics---------- 15 marks
  #Q-5]-Based on any other topic------------------------ 15 marks
  OR
  #Q-5]-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:-Massage/ Goniometry / Suspension therapy. (35Marks)

2. Short Case: - any one of the following. (20 Marks)
  ✓ Short case based on passive movements /Relaxation/Limb
  Length - Girth/ Sensation/Reflex testing/ Yoga
  posture/Aerobics/group exercise/warm ups /BP & Pulse/Chest
  Expansion and Respiratory Rate/Starting and Derived position
  etc.

3. Spots (4X5 = 20 Marks)
  ✓ Four spots based on therapeutics gymnasium. 5 marks per spot,
  5 minutes per spot.

4. Journal (5 Marks)
INTERNAL ASSESSMENT IN PRACTICAL-------- 20 marks

ELECTRO THERAPY I ------ [200 hrs]

BIOELECTRONICS (SECTION – I&II)--------didactic-35 hrs + Practical / laboratory----30 hrs

THERMO&ACTINOTHERAPY AND HIGH FREQUENCY CURRENTS (SECTION III&IV) ----didactic-50 hrs + Practical/Lab------------85 hrs

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

2. Describe effects of environmental & man made electromagnetic field at the cellular level & risk factors on prolonged exposure.
3. Describe the main electrical supply, Electric shock & precautions-;
4. Describe in brief, certain common electrical components such as transistors, valves, capacitors, transformers etc and the simple instruments used to test /calibrate these components [such as potentiometer, oscilloscope etc] of the circuitry, and will be able to identify such components.
5. Acquire knowledge of various superficial thermal agents such as Paraffin wax bath, Cryotherapy, home made remedies, etc; their physiological and therapeutic effects, Merits/ demerits; and also acquire the skill of application.
6. Acquire knowledge of high frequency modalities, their basic physics, working, physiological and therapeutic effects

Syllabus

BIOELECTRONICS (30 hrs)
Structure and properties of matter – solids, liquids and gases, adhesion, surface tension, viscosity, density and elasticity.
Structure of atom, molecules, elements and compounds.
Electron theory, static and current electricity.
Conductors, Insulators, Potential difference, Resistance & Intensity.
Ohm’s Law – Its application to AC & DC currents.
a) Rectifying Devices – Thermionic Valves, Semiconductors, Transistors, Amplifiers, Transducers, Oscillator circuits.
b) Capacitance, condensers in DC and AC Circuits.
c) Display devices & indicators – analogue & digital.

**Effects of Current Electricity:**
1. Chemical effects - Ions and electrolytes, Ionisation, Production of a E.M.F. by chemical actions.
2. Magnetic effects, Molecular theory of Magnetism, Magnetic fields, Electromagnetic Induction, eddy currents,
4. Physical Principles of sound and its properties.
5. Physical Principles of light and its properties.
7. Laws of Transmission- reflection, refraction, absorption, attenuation

**Section - II**
1. Electrical supply:
   a) Brief outline of main supply of electric current.
   b) Dangers – short circuits, electric shocks.
   c) Precautions – safety devices, earthing, fuses etc.
   d) First aid & initial management of electric shock.

**Section – III**

**THERMO & ACTINOTHERAPY**

- Physiological responses to heat gain or loss on various tissues of the body.
- Therapeutic effects of heat, cold
- Physical principles of Electro – magnetic radiation.
- Physics of sound including characteristics and propagation.
- Therapeutic cold (Cryotherapy)– Sources, biophysical effects, types, therapeutic effects, Indications, contraindications, precautions, application techniques and patient preparation.
- Thermotherapy modalities: paraffine wax bath, contrast bath, whirl pool bath, moist heat therapy; principles of application,
mode of application, therapeutic uses, indication and contraindication.

- **Infra red rays** – Wavelength, frequency, types & sources of IRR generation, techniques of irradiation, physiological & therapeutic effects, indications, contraindications, precautions,
- Operational skills of equipment & patient preparation.
- Home remedies of heat and cold

**SECTION IV** (20 hrs)

**HIGH FREQUENCY CURRENTS AND WAVES:**

- **High frequency currents (S.W.D.).**- Production, biophysical effects, types, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.
- **High frequency sound waves (Ultrasound).**- Production, biophysical effects, types, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.

**PRACTICALS**

1. Panel diagrams-Identification of components -Testing the mains supply and Machines
2. Skills of application of Equipments in Section III & IV

**TEXT BOOKS**

1. Clayton’s Electro therapy-3rd, 9th & 10th ed,
2. Electro therapy explained –by Low & Reed
3. Principles and Practice of Electro Therapy –by Joseph Kahn

**REFERENCE BOOK**

1. Clinical Electro Therapy-by Nelson & Currier
2. Electrotherapy – Evidence Based Practice – Sheila Kitchen
SCHEME OF EXAMINATION

THEORY-80 MARKS, Internal Assessment -20 MARKS

Section-A

- MCQ-
  Q - 1]- Based on Single best answer – [20x 1]------20 marks
  [It must include MUST KNOW Questions]

Section-B

- SAQ
  Q-2] - Answer any FIVE out of six — [5 x3]------15 marks
  Q-3] - 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-5]-------------------------------------------- ------15 marks

PRACTICAL- (80 Marks)

1. Long Case: - (35 Marks)
   Superficial thermal agents/IR, Cold packs, Hot pack, wax bath.

2. Short Case: - SWD, US, Contrast Bath, Whirl pool Bath (20 Marks)

3. 4 Spots - (5 Minutes per Spot and five marks per spots) spots based on Identification of electronic equipments & panel diagram of equipment etc.(4 X 5= 20 Marks)

4. Journal (5 Marks)
INTERNAL ASSESSMENT IN PRACTICAL -------- 20 MARKS

ENGLISH (COLLEGE SUBJECT)
Didactic = 20 hrs

OBJECTIVES:
At the end of the course the students are able to:-
1. Develop good vocabulary skills for better communication
2. Effectively communicates with teachers, patients and public
3. Understands methods of writing and drafting letters in English

SYLLABUS:

GRAMMAR AND VOCABULARY 13 hrs
1. Reading Comprehension
2. Verb Forms
3. Right Words (Synonyms, Antonyms, Homonyms and One-Word Substitutes)
4. Detection of Errors
5. Reported Speech
6. Transformation
7. Tenses
8. Punctuation
9. Phrases and Idioms
10. Precise writing
11. Essay
12.

COMMUNICATION AND COMPOSITION 7 hrs
1. Resume Writing
2. Letter writing and e-Correspondence
3. Note-Making
4. Report Writing
5. Expansion of Proverbs and Ideas
6. Description of Pictures

Reference:
EXAMINATION SCHEME [Theory only]

*THEORY – 50 marks

Section A-MCQ-Q-1 --------------------------------- --------------10 marks

Section B-SAQ-Q-2 Answer any Four out of Five [4 x 5] ----20 marks

Q3 Answer any Two out of Three [2 x 10] 20 marks

Grade – A+: 75% & above, A: 66 to <75%: B+: 55 to <66%, B: 50 to < 55%, C :< 50% [FFF]

Passing in the subject is mandatory

COMPUTER SCIENCE (COLLEGE SUBJECT)

DIDACTIC – 5 Hrs & PRACTICALS – 15 Hrs

OBJECTIVES: At the end of the course the students are able to:-

- Develop good skills for better communication.
- Effectively use Microsoft Office to communicate with patients while rendering care.
- To utilize PowerPoint presentations and Picture management for effective teaching and learning.
- To learn the use of computer for basic statistics using excel.
- To learn the use of Internet services for Research and Documentation.

Syllabus:

1. Introduction of Computer application for Physiotherapy practice.
2. Introduction of use of computers in teaching, learning, research.
4. Internet, Literature search.
5. Introduction to Statistical packages.
6. Introduction to Hospital management information system software.
SCHEME OF EXAMINATION -**[COLLEGE EXAMINATION]**
PRACTICALS = 50 MARKS
Grade – A+: 75% & above, A: 66 to <75%: B+: 55 to <66%, B: 50 to < 55%, C :< 50% [FFF]

Passing in the subject is mandatory

**SCHEME OF EXAMINATION OF BPT – I**

**INTERNAL ASSESSMENT**

- One Terminal & one Prelim having 80 marks each of theory and practical except Biochemistry. One Terminal & one Prelim having 40 marks theory for Biochemistry
- Total marks Theory / Practical = 80 + 80 = 160 marks (Except Biochemistry)
- For Biochemistry - Total marks Theory = 40 + 40 = 80 marks
- Average of the total marks shall be simplified for 20/ 10 marks and will be considered as Internal Assessment marks.

**University Exam pattern**

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<th>Theory</th>
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