BACHELOR OF PHYSIOTHERAPY 1st Year

SYLLABUS

ANATOMY

Time:3hrs **M.Marks: 100**

Theory: 80+20 Int. assess = 100

Note: The question paper covering the entire course shall be divided into two sections. Each section to be attempted in a separate answer book and to be evaluated by separate examiners.

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Question2: This will consist of one medium answer question with answer to each question upto three pages in length. One question will be set by the examiner and will be compulsory. This question will consist of 10 marks.

Question3: This will consist of two long answer questions with answer to each question upto 5 pages in length. Two questions will be set by the examiner and the candidate will be required to attempt one. Each question will carry 15 marks.

SECTION A:

I General Introduction: 24 Hrs/16Marks

1. Histology-- Theory and microscopic sections of loose connective tissue, dense connective tissue (tendons and ligamentumnuchae), epithelium, areolar tissue, adipose tissue, hyaline, elastic and fibrous cartilage, compact and spongy bone, bone marrow, compact and spongy bone, bone marrow, skeletal, smooth & cardiac muscle, nerve lymph node etc.
2. Osteology-- Theory of structure, function, growth, fracture and repair of bones. Physical study of all the bones in the body. Also general features and functions of cartilage, tendon, ligament, articular capsule, synovial membranes, bursae, menisci, intraarticular cartilages. Classification of joints with their examples and specific features.
3. General Embrology—Development of germs cells, development of muscles, bones, joints & nerves etc.

II Systems of human body: 36 Hrs/24Marks

1. Cardio- Vascular system—Description of arteries, capillaries, veins on a regional basis. Heart, Lymphatic system.
2. Respiratory system—Anatomy of upper and lower respiratory tract including nose, larynx, trachea, bronchi, pleura and lungs. Also muscles of normal and forced respiration. Description of intercostal spaces with surface markings.

3. Digestive system—Anatomy og gastrointestinal tract with special em[hasis on surface marking.
4. Urogenital system—Anatomy of urinary system, male and female reproductive systems.
5. Endocrine system—The various endocrine glandswith their structure, function and neuroregulation. Role of hypothalamus.
6. Integumentary system: dermatomes

Section B

III Neuro-anatomy: Development & organization of CNS 22 Hrs/15Mraks

Microscopic and gross study of:

1.Peripheral nerves 2. Neuromuscular junction

3.Sensory end organs 4. Spinal cord segments &

5.Brainstem 6.Cerebellum

7.Inferiorcolliculi 8.Superior colliculi

9.Diencephalon 10.Hypothalamus

11.Epithalamus 12.Thalamus

13.Cerebral hemispheres 14.Corpus striatum

15.Rhinencephalon 16.Lateral ventricles

17.Meninges 18.Blood supply of bones

19.Internal capsule 20.Visual radiation

21.Auditory radiation 22.Thalamocortical radiations

23.Pyramidal systems 24.Extrapyramidal systems

25.Anatomicalintegeration 26.Intracortical integeration

27.Sympathetic system 28.Para sympathetic system.

29.Cranial nerves

IV Musculoskeletal system 30 Hrs./20Marks

A. Myology
1. The fascia and muscles of upper limb.
2. The fascia and muscles of lower limb.
3. The fascia and muscles of trunk.
4. The fascia and muscles of head, neck and face.
5. Muscles of eye.

B. Osteology and Arthrology

1. General structure and classification of all bones of skeleton and their attachments.
2. Classification of joints.
3. Movement of joints.
4. Factors permitting and limiting movement of joints.
5. Joints of upper limb.
6. Joints of lower limb, arches of foot.
7. Shoulder girdle.
8. Pelvic girdle.
9. Joints of head, neck and T.M joints.
10. Joints of trunk.

V Surface and Radiological anatomy 8 Hrs./5Marks

Surface anatomy of the body.Radiographic appearance of musculoskeletal system of upper limb, lower limb & Spine.

Books Suggested:

1. Inderbeer Singh, textbook of anatomy with colour atlas- vol.1,2,3. Jaypee brothers.
2. B.D Chaurasia, Human Anatomy- vol.1,2,3, CBS publishers and distributers.
3. Meminn's Last's Anatomy- Regional and applied, Churchill Livingstone.
4. Meminn's et al- A colour atlas of human anatomy, Mosby.
5. Conningham Manual of practical anatomy Vol. I,II.III, Churchill. Livingstone.
6. Inderbeer Singh, A textbook on human neuroanatomy, Jaypee brothers.
7. Snell- Clinical Anatomy_ Lippincott.
8. Williams &Warnick, Gray's Anatomy- Churchill Livingstone.
9. Textbook of Osteology – Inderbeer Singh.

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SYLLABUS

PHYSIOLOGY

Time: 3 hrs **M. Marks: 100**

Theory: 80+20 Int. assess = 100

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SECTION A:

I General Introduction: 15 Hrs/10Marks

1. Cell Introduction: Outline of basic concepts of cell structure, functions of componentsand transport across membranes.
2. Skin: Functions, Blood of flow and temperature regulation.
3. Blood and lymph: Cell renewal system, Haemoglobin, erythrocyte granulocyte, lymphocyte, coagulation, regulation of hydrogen within concentration of body fluids, fluid didtribution and exchange.

II Physiology of system of body 45 Hrs./30Marks

1. Digestion: Control of food and water intake and secretion and absorption movements of the alimentary canal.
2. Circulation: Cardiovascular system, mechanical and electrophysiological activity of the heart, regulation of heart, coronary circulation, haemodynamics, circulation through brain, skin and skeletal muscle.
3. Excretion: Renal functions including formation of urine and micturition.
4. Respiration: Respiratory gases, pulmonary gas exchange, control and mechanocs of breathing, hypoxia, asphyxia, dyspnea, oxygen therapy and micturition.
5. Endocrine system: outline of various hormones and their actions, pituitary gland, thyroid, parathyroid, adrenal glands and gonads.
6. General metabolism: carbohydrate, protein and fat metabolism.

Section - B

III Neurophysiology **30 Hrs./20Marks**

1. Neuron: Properties and function.
2. Action Potential.
3. Special properties of nerve trunks and tracts.
4. Motor units.
5. Reflex physiology.
6. Synapse and synaptic transmission.
7. Supraspinal control.
8. Cerebellum and basal ganglia.
9. Autonomic nervous system.
10. Somatic sensation.
11. Pain.
12. Taste, olfaction, Auditory, visual.
13. Neuro- Physiological Psychology.

IV Muscle Physiology **15 Hrs./10Marks**

1. Structure and function of muscle tissue- skeletal and cardiac.
2. Chemical processes involved in musvle contraction.
3. Physiology of muscle contraction.

V Physiology of exercise and work **15 Hrs./10Marks**

1. Neuromuscular activity, human movement, physiological mechanism in movement behavior, strength, endurance, analysis of movement.
2. Circulatory and respiratory response to exercise including effects on the heart blood circulation body fluid changes, pulmonary ventilation, gas exchange, transport etc.
3. Effects of exercise and work on other body functions.
4. Metabolic and environmental aspects of exercise and work- metabolism, energy requirement, efficiency of muscular work, nutritional aspects, heat and body temperature regulation & environmental factors.
5. Effects of exercise training- endurance, fatigue and recovery.
6. Fitness and health- age, sex, body type, race, stress and medical aspects of exercise.

BACHELOR OF PHYSIOTHERAPY 1st Year

SYLLABUS

BIOCHEMISTRY

Time: 3 hrs **M. Marks:100**

Theory: 80+20 Int. assess = 100

Teaching Hours: 120 hrs Theory: 100

Note: The question paper covering the entire course shall be divided into two sections. Each section to be attempted in a separate answer book and to be evaluated by separate examiners.

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SECTION A:

Sr No	Topics	Approx Allocation	
		Teaching Hrs	Marks
1	1. Biophysics: Concept of pH and buffers, acid base equilibrium osmotic pressure and its physiological applications. 2. Cell: Morphology, structure & function of cell, cell membrane, Nucleus, Chromatin, Mitochondria, Endoplasmic Reticulum, Ribosomes 3. Carbohyrates: Definition, functions, sources, classification, Monosaccharides, Disaachrides. Polysaccharides, Mucopolusaccharide and its importance	17	13
2	4. Lipids: Definition, function, sources, classification, simple lipid, compound lipid, derived lipid, unsaturated and saturated fatty acid. Essential fatty acids and their importance, blood lipids and their implications, cholesterol and its importance 5. Proteins definition, sources, classification, simple protein, conjugated protein, derived proteins and its properties 6. Nucleic acid: Structure and function of DNA & RNA, Nucleiosides, nucleiotides, genetic code, biologically important nucleotides.	20	13
3	7. Enzymes: Definitions, classification, mode of action, factors affecting enzyme action, clinical importance of enzyme. 8. Vitamins: Classification, Fat soluble vitamins, A,D,E,K. Water soluble vitamins B& C, Daily requirements, physiological functions and diseases of vitamin deficiency 9. Bioenergetics: Concept of free energy change, exergonic and endogenic reactions, concepts regarding energy rich compounds, respiratory chain and biological oxidation	21	14

SECTION -B

4	10. Carbohydrate Metabolism: Glycolysis, HMP shunt pathway, TCA cycle, glycogenolysis, glucongensis, maintenance of blood glucose. 11. Lipid Metabolism: Fatty acid oxidation, fatty acid synthesis, metabolism of cholesterol, ketone bodies, atheroscelerosis and obesity. 12. Protein metabolism: Transamination, Transmethylation, deamination, Fate of ammonia, urea synthesis and synthesis of creatinine, inborn errors of metabolism.	21	14
5	13. Water &Electrolyte fluid compartment, daily intake and output sodium and potassium metabolism. 14. Nutrition: Balance, diet metabolism in exercise and injury, diet for chronically ill and terminally ill patients. 15. Connective tissue: Mucopolysaccharide connective tissue protein, glycoprotein, chemistry and metabolism of bone	18	13
6	16. Nerve tissue: Composition, metabolism, chemical mediators of nerve activity. 17. Hormones: General characteristics and mechanism of hormone action insulin, glucagone, thyroid, parathyroid hormones, cortical and sex hormones. 18. Isotopes: Isotopes and their role in treatment and diagnosis of diseases.	23	13

Books Suggested:

1. Medical Biochemistry for physiotherapy students- HarpreetKaur—Jaypee Brothers.
2. Textbook of biochemistry- Chatterjee M.N. – Jaypee Brothers.
3. Textbook of biochemistry for medical students- Vasudevan D.M.-Jaypee Brothers.
4. Clinical biochemistry- Metabolic and clinical aspects- Marshall and Bangert Churchill Livingstone.
5. Biochemistry by Southerland.

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SYLLABUS

ELECTROTHERAPY – I

Time : 3 hrs **M. Marks: 100**

Theory: 80+20 Int. assess = 100

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SECTION A:

I Physical Principles: **39 Hrs/ 25Marks**

Structure and properties of matter- solids, liquids, gases, adhesion, surface tension, viscosity, density and elasticity.

Structure of atoms, Molecules, elements and compounds.

Election Theory, static and current theory.

Conductors, Insulators, Potential difference, Resistance & Intensity.

Ohm's Law- Its application to AC & DC currents.

a) Rectifying devices—Thermionic Valves, Semiconductors, Transisters, amplifiers, Transducers Oscillator Circuits.
b) Capacitance, condensers in DC and AC circuits.
c) Display devices and Indicators- analogue & digital.

Effects of Current Electricity:

1. Chemical effects- Ions and electrolytes, Ionisation, Production of a E.M.F by chemical action.

P.T.O.

2. Magnetic effects, Molecular theory of Magnetism, Magnetic fields, Electromagnetic induction.
3. Milli ammeter and voltmeter, Transformers and choke coil.
    a) Thermal effects- Joule's Law and heat production.
4. Physical principles of sound and its properties.
5. Physical principles of light and its properties.
6. Electromagnetic spectrum- biophysical application.

Section –II Electrical supply: 9 Hrs./ 6 Marks

a) Brief outline of main supply of electric current.
b) Dangers- Short circuits, electric shocks.
c) Precautions- Safety devices, earthing and fuses, etc.
d) First aid & initial management of electric shock.

Section –III Low Frequency currents 35 Hrs./ 22 Marks

1. Introduction to direct, alternating & modified currents
2. Production of direct current- Physiological and therapeutic effects of constant current, anodal and cathodal galvanism, ionization and their application in various conditions.
3. Iontophoresis: Principles of clinical application, indication, contraindication, precaution, operational skills of equipment & patient preparation.
4. Modified direct current- various pulses, duration, frequency and their effects on Nerve and muscle tissue, Production of interrupted and surged current & their effects.
5. Modified direct current- Physiological and therapeutic effects, principles of clinical application, indication, contraindications, precautions, operational skills of equipment and patient preparation.
6. Transcutaneous Electrical nerve stimulation (TENS):

a) Types of low frequency, pulse width, frequencies and intensities used as TENS applications.
b) Theories of pain relief by Tens.
7. Principle of clinical application, effects and uses, indications, contraindications, precautions, operational skills of equipment and patient preparation.

Section- IV Electrical Reactions and electrodiagnostic tests: 19 Hrs/ 12 Marks

Electrical stimuli and normal behavior of nerve and muscle tissue.

Types of lesion and development of reaction of degeneration.

Faradic- Intermittent direct current test.

S.D curve and its application.

Chronaxie, Rheobase& pulse ratio.

Section- V **15 Hrs/ 10 Marks**

1. Infra red rays – Wavelength, frequency, types and sources of IRR generation, techniques of irradiation, physiological and therapeutic effects , indication, contraindications, precautions, operational skills of equipment and patient preparation.

2. Ultraviolet rays:(UVR)

    - Wavelength, frequency, types and sources of UVR generation, techniques of irradiation, physiological and therapeutic effects , indication, contraindications, precautions, operational skills of equipment and patient preparation.
    - Dosimetry of UVR.

Section- VI Superficial Heat- Paraffin wax bath, moist heat, electrical heating pads

8 Hrs./ 5 Marks

a) Mechanism of production
b) Mode of heat transfer
c) Physiological and therapeutic effects

Indication, contraindications, precautions, operational skills of equipment and patient preparation.

Books Suggested:

1. Electrotherapy explained- Principles and practice- Low & Reed- Butterworth Heinmann.
2. Clayton's Electrotherapy, 9th ed. Forster &PalastangaBallieraTindalll.
3. Therapeutic heat and cold- Lehmann- Williams & Wilkins.
4. Principles and practice of electrotherapy- Kahn- Churchill Livingstone.
5. Textbook of Electrotherapy- Jagmohan Singh- Jaypee Brothers, New Delhi.

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SYLLABUS

EXERCISETHERAPY – I

Time: 3 hrs **M. Marks : 100**

Theory: 80+20 Int. assess = 100

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SECTION -A

Section-I **38 Hrs/25 Marks**

Introduction to Exercise therapy, principles, techniques and general areas of its application, assessment and its importance.

Description of fundamental starting positions and derived positions including joint positions, muscle work, stability, effects and uses.

Introduction to Movements including analysis of joint motion and muscle work.

Classification of Movements- Describe the types, techniques of application, indications, contraindications, effects and uses of the following:

a)Active movement b)Passive movement

c)Active assisted movement d)Resisted movement

e)To study the principles, techniques of application, indication, precaution, effects and uses of suspension therapy.

Section-II **Manual muscle testing** **15 Hrs.**

a) Principles and application techniques of MMT.

b) Testing position, procedure and grading of muscles of the upper limb, lower and trunk etc.

Section –III Goniometry 7 Hrs.

Goniometers and its types

a) Principles, techniques and application of goniometry.
b) Testing position, procedure and measurement of R.O.M. of the joints of upper limb, lower limb and trunk.

Section- IV Soft tissue manipulation(Therapeutic massage) 22 Hrs.

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

Section- V Motor Learning 15 Hrs.

I. Introduction to Motor learning
    i. Classification of Motor Skills.
    ii. Measurememt of Motor performance
II. Introduction to Motor Control
    i. Theories of Motor Control
    ii. Applications
III. Learning Environment
    i. Learning of skill
    ii. Instruction & augmented feedback
    iii. Practice conditions

Section- VI Relaxation and therapeutic Gymnasium 23 Hrs.

Relaxation

1. Describe relaxation, muscle fatigue, muscle spasm and tension (mental and physical).
2. Factors contributing to fatigue & tension.
3. Techniques of relaxation (local &general).
4. Effects, uses and clinical application.
5. Indication and contraindication.

Therapeutic Gymnasium

I. Set up of a gymnasium & its importance.
II. Various equipments in the gymnasium.

Operational skills, effects & uses of each equipment.

EXERCISE THERAPY PRACTICAL

1. To practice all the soft tissue manipulative techniques region wise- upper limb, lower limb, neck, back and face.
2. To practice measurement of R.O.M of joints- upper limb, lower limb & trunk.
3. To practice the grading of muscle strength region wise- upper limb, lower limb, trunk.
4. To study the position of joints, muscle work and stability of various fundamental and derived positions.
5. To study the different types of muscle contraction, muscle work, group action of muscles and co-ordinated movements.
6. To practice the various types of suspension therapy and its application on various parts of body- region wise.
7. To study & practice local and general relaxation techniques.
8. To study the structure and function along with application of various equipment of various equipment in a gymnasium.

Books Suggested:

1. Practical Exercise therapy- Hollis- Blackwell Scientific publications.
2. Therapeutic Exercise- Basmajen- Williams and wilkins.
3. Therapeutic Exercises Foundations and Techniques- Kisner& Colby- F.A davis.
4. Proprioceptive Neuromuscular Facilitation- Voss et al- William and Wilkins.
5. Principle of Exercise therapy- Gardiner- C.B.S Delhi.
6. Beard's massage- Wood- W.B Saunders.
7. Motor control- theory and practical applications Shumway- Cook &Wallcott- Lippincoptt.
8. Hydrotherapy, principles and practices- Campion- Butterworth Heinmann.
9. Muscle testing and functions- Kendall- Williams and Wilkins.
10. Daniel and Worthingham's- muscle testing- Hislop&Montgometry- W.B. Saunders.
11. Measurement of joint motion: A guide to Goniometry- Norkins& White F.A Davis.
12. Massage for Therapist:- Margaret Hollis.

Computer Applications (Practical)

M. marks:50

Int. assess: 10

Teaching Hours: Practical: 50

Note- Only pratical examination will be conducted for this paper.

- To study the various components of a personnel computer.
- To have working knowledge of various hardwares and softwares.
- To have working knowledge of common operating systems.
- To practice the operational skills of common computer computer applications, including work processing and spread sheet software.
- To have a basic knowledge of utility of multi-media.
- To learn skills of web surfing- For literature, researches relevant to field of medicine.

Paper—VII **English (Theory)**

Time: 1 hr 30 min **M.Marks: 50**

Teaching Hours: Theory: 50

Unit	Time(Hrs)	Learning objectives	Content	Teaching Learning Activities	Assesssment methods
I.	10	Speak and write grammatically correct English	• Review of Grammer • Remedial study of grammer building • Vocabulary • Phonetics • Public speaking	• Demonstrate use of dictionary • Class room conversation • Exercise on use of grammer • Practice in public speaking	• Objective type • Fill in the blanks • Para phrasing
II	10	Develop ability to read, understand and express meaningfully the prescribed text.	• Read and comprehend passages • Note making	• Exercise on: - Reading - Summarizing - Comprehension	. Short answer . Essay type
III.	10	Develop writing skills	• Various forms of composition - Letter writing - Precise writing - Notice writing - Anecdotal records - Diary writing - Report on health	• Exercise on writing - Letter writing - Precise - Diary - Health problems - Story writing - Resume/ CV - Discussion	Assessment of skills based on the check list.
IV.	10	Develop skills in spoken English	• Spoken English - Oral report - Discussion - Debate - Telephonic conversation	• Exercise on - Debating - Participating in seminar - Panel symposium - Telephonic conversation	Assessment of skills based on the check list.
V.	10	Develop skills in spoken	• Spoken English - Oral report	• Exercise on - Debating - Participating	Assessment of skills based on the check list.

		English	- Discussion - Debate Telephonic conversation	in seminar - Panel symposium Telephonic conversation	
VI.	10	Develop skills in listening, comprehension	- Listening - Comprehension - Media, audio, video, speeches etc.	• Exercise on - Listening to audio, video, tapes and identify the key points.	Assessment of skills based on the check list.