



मध्यप्रदेश आयुर्विज्ञान विश्वविद्यालय, जबलपुर
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भौतिक चिकित्सा स्नातक पाठ्यक्रम (BPT) 2015 बैच में प्रवेशित
विद्यार्थियों हेतु

पाठ्यक्रम एवं परीक्षा योजना

**SYLLABUS AND SCHEME OF EXAMINATION FOR
BACHELOR OF PHYSIOTHERAPY 2015 BATCH
STUDENTS**

Section – II

B.P.T. FIRST YEAR

STAFF PATTERN FOR FIRST YEAR B.P.T.

Subjects	Staff Required
Anatomy	1 M.S. Anatomy, Lecturer/Asst. prof.
Physiology	1 M.D. Physiology, Lecturer/Asst. prof.
Medical electronics & eletro-therapeutic modalities	Physics lecturer/biomedical engineer and 1 Asst. professor of physiotherapy
Biomechanical modalities	1 Asst. professor of physiotherapy
(mechanics & exercise- Therapeutic modalities)	1 M.Sc. physics lecturer/bio-medical engineer
Sociology	1 M.A. Sociology/Medical social-worker
Psychology	1 Psychologist, M.A.(psychology) and D.M And S.P. (diploma in medical and social Psychology)

FIRST YEAR B.P.T. EXAMINATION

Sr. No.	Subject	Internal Assessment		University examination			Total
		Theory	Practical	Theory	Viva	Practical	
1	Human Anatomy	20	20	100	20	40	200
2	Human Physiology	20	20	100	20	40	200
3	Bioelectrical Modalities	20	-	80	-	-	100
4	Biomechanical Modalities	20	-	80	-	-	100
5	Psychology and Sociology	20	-	80	-	-	100

Pass Mark: - In the subjects of Anatomy, Physiology, a candidate must obtain 50% in aggregate with a minimum of 50 % in theory, Including orals and minimum 50% in practical.

SCHEME OF EXAMINATION FOR FIRST YEAR B.P.T

There shall be five subjects for the first year B.P.T. Examination.

The subjects Qualification of the examiners and the pattern of Examination will be as follows.

1. HUMAN ANATOMY

Subject	Internal Assessment		University examination			Total
	Theory	Practical	Theory	Viva	Practical	
Human Anatomy	20	20	100	20	40	200

There shall be one paper setter external or internal for theory examination and two examiners, one internal (Chairman) and one external for practical examinations. Recognized teachers in Anatomy after M.S.-Anatomy with five years of teaching experience shall be on the panel of examiner. The viva marks shall be added to university theory examination marks and 50% shall be the passing marks for both theory and practical university examination respectively. The pattern of University theory

examination will be as under for 100 Max. Marks.

No. & Type of Question	Marks for each question	Total Max. Marks
10 Very Short Answer Questions (<i>Answer to be given in 50-60 words</i>)	02	20
5 Short Answer Questions (<i>Answer to be given in 250-300 words</i>)	10	50
2 Essay Type Questions (<i>Answer to be given in 450-500 words</i>)	15	30
		100

2. HUMAN PHYSIOLOGY

Subject	Internal Assessment		University examination			Total
	Theory	Practical	Theory	Viva	Practical	
Human Physiology	20	20	100	20	40	200

There shall be one paper setter external or internal for theory examination and two examiners, one internal (Chairman) and one external for practical examinations. Recognized teachers in Physiology after M.D.-Physiology with five years of teaching experience shall be on the panel of examiner. The viva marks shall be added to university theory examination marks and 50% shall be the passing marks for both theory and practical university examination respectively. The pattern of University theory examination will be as under for 100 Max. Marks.

No. & Type of Question	Marks for each question	Total Max. Marks
10 Very Short Answer Questions (<i>Answer to be given in 50-60 words</i>)	02	20
5 Short Answer Questions (<i>Answer to be given in 250-300 words</i>)	10	50
2 Essay Type Questions (<i>Answer to be given in 450-500 words</i>)	15	30
		100

3. BIO-ELECTRICAL MODALITIES

Subject	Internal Assessment		University examination			Total
	Theory	Practical	Theory	Viva	Practical	
Bioelectrical Modalities	20	-	80	-	-	100

The examination shall be of 80 marks for medical electronics and electrotherapeutic modalities. Total internal assessment will be 20 Marks. The paper setter and evaluator

should be recognized teachers in Physiotherapy after M.P.T. or B.P.T. with five years of teaching experience shall be on the panel of examiner. 50% shall be the passing marks for theory university examination . The pattern of University theory examination will be as under for 80 Max. Marks.

No. and Type of Questions	Marks for each Question	Total Marks
5 very short answer Questions (<i>Answer to be given in 50-60 words</i>)	02	10
4 short answer Questions(<i>Answer to be given in 250-300 words</i>)	10	40
2 essay type Questions(<i>Answer to be given in 450-500 words</i>)	15	30
Total Marks		80

4. BIOMECHANICAL MODALITIES

Subject	Internal Assessment		University examination			Total
	Theory	Practical	Theory	Viva	Practical	
Biomechanical Modalities	20	-	80	-	-	100

The examination shall be of 80 marks for mechanics and exercise therapeutic modalities. Total internal assessment will be 20 Marks . The paper setter and evaluator should be recognized teachers in Physiotherapy after M.P.T. or B.P.T. with five years of teaching experience shall be on the panel of examiner. 50% shall be the passing marks for theory university examination . The pattern of University theory examination will be as under for 80 Max. Marks.

No. and Type of Questions	Marks for each Question	Total Marks
5 very short answer Questions (<i>Answer to be given in 50-60 words</i>)	02	10
4 short answer Questions(<i>Answer to be given in 250-300</i>	10	40

words)		
2 essay type Questions(Answer to be given in 450-500 words)	15	30
Total Marks		80

5. SOCIOLOGY AND PSYCHOLOGY

Subject	Internal Assessment		University Examination			Total
	Theory	Practical	Theory	Viva	Practical	
Sociology & Psychology	20	--	80	--	--	100

The University examination shall be of 80 marks with **Section – A: Sociology** and **Section – B : Psychology** the university theory examination marks for Sociology shall be 40 and for Psychology 40 marks respectively. There shall be two paper setters and two evaluators, one from Sociology and one from Psychology . Section- A (40 marks), which will be set by Sociology examiner and Section-B (40 marks), by Psychology examiner. Recognized teachers in Sociology and Psychology with five years of experience shall be on the panel of examiners , 50% shall be the minimum passing marks. Internal assessment will be of 10 marks in each subject. Total internal assessment will be 20 Marks. The pattern of University theory examination will be as under for **80 Max. Marks**. There will be two section i.e. Section-A: Sociology and Section-B: Psychology of **40 Max. Marks each section** and distribution of marks for questions will be as under –

No. & Type of Question	Marks for each question	Total Max. Marks
5 Very Short Answer Questions (Answer to be given in 50-60 words)	02	10
2 Short Answer Questions (Answer to be given in 250-300 words)	08	16
1 Essay Type Questions (Answer to be given in 450-500 words)	14	14
Total Marks		40

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PAPER-I : HUMAN ANATOMY

Total No. of Hrs:- 200

Theory -140 Hrs.

Practical / Laboratory- 60 hrs

SCHEME OF EXAMINATION

Subject	Internal Assessment		University examination			Total
	Theory	Practical	Theory	Viva	Practical	
Human Anatomy	20	20	100	20	40	200

There shall be one paper setter external or internal for theory examination and two examiners, one internal (Chairman) and one external for practical examinations. Recognized teachers in anatomy after M.S.-Anatomy with five years of teaching experience shall be on the panel of examiner. The viva marks shall be added to university theory examination marks and 50% shall be the passing marks for both theory and practical university examination respectively. The pattern of University theory examination will be as under for 100 Max. Marks.

No. & Type of Question	Marks for each question	Total Max. Marks
10 Very Short Answer Questions (<i>Answer to be given in 50-60 words</i>)	02	20
5 Short Answer Questions (<i>Answer to be given in 250-300 words</i>)	10	50
2 Essay Type Questions (<i>Answer to be given in 450-500 words</i>)	15	30
		100

Syllabus Contents: -

GENERAL ANATOMY

1. Introduction scope of anatomy cell as a structural and fundamental unit, Organization of tissue organs and system, Anatomical position of the body, Anatomical terms.
2. Skin and the appendages of the skin.
3. Muscles: Voluntary and Involuntary and cardiac muscles, short description of the structure of different muscles.
4. Muscles: Classification of voluntary muscles. Origin and Insertion, Tendon, Aponeurosis, Isometric and Isotonic contraction of muscles.
5. Bones: composition and functions, classification of bones according to morphology and development, various terms and markings on the bones.

6. Bones: Development of bones, parts of long bones and blood supply of bones, general remarks about bones of skull, thorax, vertebral column and bones of extremities in detail.
 7. Joints: Definition, classification of joints structure and cartilaginous joints.
 8. Joints: Structure of synovial joints, Movements of joints, blood supply of bones and joints and Bursae, close pack and loose pack position of the joints.
 9. Nervous system: Nerve cell, Synapse and reflex.
 10. Nervous system: organization of central nervous systems Spinal Nerves and nerve endings.
 11. Cardiovascular system: Arteries Veins, Capillaries, and Collateral circulation.
 12. Cardiovascular system: Blood as a connective tissue, Gross anatomy of Heart, large blood Vessels.
 13. Respiratory system: General outline of respiratory passages, gross anatomy of Lung, Pleura.
 14. Respiratory system: Broncho-pulmonary segments, Inter-costal muscles and Mechanism of respiration.
 15. Digestive system: General idea or outline of gastro- intestinal tract and associated glands.
 16. Excretory system structure and function of kidney, general outline of Ureters Urinary bladder and Urethra.
 17. Reproduction system: general outline of male and female general organs.
 18. Endocrines: Definition, Structure in general.
 19. Lymphatic system: Lymph circulation, Lymph nodes and Lymphoid tissue.
- (Neuroanatomy) Emphasis)- Gross structure of Sulci and Gyri and various areas of cerebral hemispheres, Thalamus, Hypothalamus, Basal Ganglia.
- (I) Cerebellum.
 - (ii) Pons, Medulla
 - (iii) Spinal Cord.
 - (iv) Ascending tracts.
 - (v) Descending tracts

(iv) Clinical application of Knowledge of the tracts.

(vii) Autonomic nervous system.

(viii) Nervous control of the urinary Vadder and bladder dysfunction.

Lecture-Demonstration

1. Muscles of the whole body.
2. Demonstration of organs in thorax and abdomen.
3. Demonstration of viscera in head, face and neck.
4. Demonstration of all the glands in the body.
5. Identification of bony prominences on inspection and palpation in the body, especially of extremities.
6. Points to palpate nerves and arteries.
7. Identification of prominent muscles.
8. Extra-ocular muscles and salient points about the eye ball.
9. Demonstration on Brain.

KINESIOLOGY

1. Basic Concepts
2. Muscular system
3. Joints
4. Machinery Musculo skeletal system
5. Principles of Motion
6. Principles of force and work
7. Basic for the development of motor skill
8. Principles of stability
9. Postural principles

REGIONAL ANATOMY

1. Superior Extremity:

Osteology: Clavicle, Scapula, Humerus, Radius, Ulna Carpals Metacarpals

Soft parts: Breast, Pectoral region, Front of arm, Back of arm, Cubital fossa, front of forearm, back of forearm, nerves and vessels of forearm, palm, Dorsum of Hand, Shoulder girdle, joints of hand.

2. Inferior Extremity

Osteology: Hip bone, Femur, Tibia, Fibula and Patella, Tarsals, Metatarsals.

Soft parts: Front of thigh- Femoral canal and femoral hernia, Adductor canal, medial compartment of thigh, gluteal region, Back of thigh Popliteal fossa, Anterior compartment of leg, posterior compartment of leg, sole of foot, venous drainage of leg, hip joint, ankle joint, tarsal joints.

Trunk:

Osteology: Cervical, Thoracic and Lumbar Vertebra, Sacrum, Coccyx and Ribs.

Soft tissue: Inter-vertebral joints, costo-vertebral joints, Inter-vertebral Disc; Ligaments and Muscles.

Skull as a whole and mandible.

Demonstration of Dissected parts.

Parts of Limbs. Trunk, Brain, Thorax and Abdominal Contents.

Books Recommended:

1. An Introduction to fundamental of anatomy by David Sindair (Blackwell Publication).
2. Gray's Anatomy
3. Cunningham's Manual of Practical anatomy
4. Anatomy and physiology by Smout and Macdonald (Edward Arnold)
5. Kinesiology by Katherine (Saunders Co).
6. Clinical Kinesiology by Brunstrom.
7. Kinesiology and Applied Anatomy by Resch-Bruke (Lee & Febigar)
8. Applied anatomy and Kinesiology by W. Bower & H. Stone (Lee & Febigar)
9. Caties primary anatomy by Bestmaji J.
10. Principles of anatomy and Physiology by Tortora & Grabowski (Harper Collons College Publishers)
11. Anatomy by B.D. Chourasia.



PAPER-II : HUMAN PHYSIOLOGY

[Total no. of Hrs.= 200]

DIDACTIC -140 HRS.

Practical / Laboratory- 60 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 describe physiological functions of various systems, with special reference to Musculo-skeletal, Neuro-motor, Cardio-respiratory, Female urogenital function and alteration in functions with ageing.
3. Analyze physiological response & adaptation to environmental stresses with special emphasis on physical activity and temperature.
4. Acquire the skill of basic clinical examination, with special emphasis to Peripheral & Central Nervous system, cardiovascular & Respiratory system, & Exercise tolerance/ Ergography.

Note: Group discussions, seminars and tutorial will be on the topics covered in didactic lectures.

Scheme of Examination

Subject	Internal Assessment		University examination			Total
	Theory	Practical	Theory	Viva	Practical	
Human Physiology	20	20	100	20	40	200

There shall be one paper setter external or internal for theory examination and two examiners, one internal (Chairman) and one external for practical examinations. Recognized teachers in Physiology after M.D. Physiology with five years of teaching experience shall be on the panel of examiner. The viva marks shall be added to university theory examination marks and 50% shall be the passing marks for both theory and practical university examination respectively. The pattern of University theory examination will be as under for 100 Max. Marks.

No. & Type of Question	Marks for each question	Total Max. Marks
10 Very Short Answer Questions (<i>Answer to be given in 50-60 words</i>)	02	20
5 Short Answer Questions (<i>Answer to be given in 250-300 words</i>)	10	50
2 Essay Type Questions (<i>Answer to be given in 450-500 words</i>)	15	30
		100

Syllabus-

1. GENERAL PHYSIOLOGY

1. Structure of cell and its functions
2. Transport across cell membrane
3. Body fluids- Homeostasis

2. BLOOD

1. Composition, function and physical properties of blood
2. Plasma protein and their functions
3. Erythropoiesis, leucopoiesis and thrombopoiesis in brief
4. Hemoglobin and its functions
5. Structure and function of leukocytes
6. Immunity
7. Physiology of clotting mechanism and fibrinolysis
8. Blood group and physiological basis of transfusion medicine

3. NERVE

1. Structure, classification & properties.
2. R.M.P.
3. Action potential
4. Propagation of nerve impulse.
5. Degeneration & regeneration
6. Reaction of degeneration [retrograde]

4. MUSCLE

1. Structure-properties-classification-excitation/contraction coupling
2. Motor unit- Electromyography
3. Neuro-muscular transmission
4. Physiological basis of myopathies.

5. NERVOUS SYSTEM

1. Organization of Nervous system.
2. Neuron and Neuroglia
3. Synapse: Properties and Synaptic transmission.
4. Reflex arc, its components, properties, type and neurological impairments.
5. General sensations and their properties.
6. Ascending tracts of the Spinal cord and effects of their lesions.
7. Pain and physiological Analgesia.
8. Motor neurons, Descending tracts and their applied aspects.
9. Regulation of Muscle Tone by Spinal and Supra-spinal mechanism.
10. Function of Brain -stem, Cerebellum, Basal Ganglia and Motor cortex.
11. Control of Voluntary movement
12. Regulation of posture and equilibrium vestibular apparatus.
13. Broad functions of Thalamus, Hypothalamus, Major lobes of Cerebral cortex and Ascending Reticular Activation System
14. Limbic System
15. Learning, memory, speech and conditional reflexes.

6. SPECIAL SENSES

1. Function anatomy of the Eye
2. Optics of Vision
3. Retinal Function
4. Visual Pathways
5. Mechanism of Hearing.
6. Sensation of Taste and Smell.

7. AUTONOMIC NERVOUS SYSTEM

1. Functioning of Autonomic Nervous System with social reference to micturition defecation and labour
2. Higher neural regulation of ANS.

8. SKINS AND BODY TEMPERATURE REGULATION

1. Functional anatomy of the Skin and its function
2. Different mechanisms involved in body temperature regulation.
3. Physiological basis of Pyrexia and Hypothermia.

9. CARDIOVASCULAR SYSTEM

1. General introduction of cardiovascular systems.
2. Structure and properties of Cardiac muscle.
3. Cardiac cycle and Heart sounds.
4. Interpretation of normal Electrocardiogram.
5. Cardiac output and cardiac failure.
6. Venous return,
7. Heart rate and its regulation.
8. Structure and organization of vascular tree.
9. Arterial blood pressure and pathophysiology of Hypertension.
10. Characteristics of Coronary circulation and pathophysiology of Coronary artery disease
11. Capillary circulation and physiology basis of Edema.
12. Pathophysiology of Shock.

10. RESPIRATORY SYSTEM

1. Functional anatomy of Respiratory System.
2. Mechanics of breathing: Mechanism of inspiration and Expiration, intrapleural and intra-alveolar pressures, Compliance, Surfactant, Airway resistance and work of breathing.
3. Respiratory membrane and diffusion of gases.
4. Composition of gases and Partial pressures.
5. Oxygen and Carbon-dioxide transport.
6. Lung Volume, Capacities and Lung function tests.

7. Nervous and Chemical control of breathing.
8. Physio-clinical aspects of Dyspnoea, Apnoea, Asphyxia, Hypoxia, Cyanosis, Breath holding, high and Low atmospheric pressures.

11. DIGESTIVE SYSTEM.

1. Functions of (a) Saliva, (b) Gastric juice, (c) Pancreatic juice (d) Succus entericus, (e) Bile.
2. Movements of G.I.T.
3. Functions of Liver.

12. RENAL SYSTEM

1. Functions of Kidney
2. Formation of Urine.
3. Physiology of Micturition- Neurogenic bladder.

13. ENDOCRINE AND REPRODUCTIVE SYSTEM

1. Role of Hypothalamus as an endocrine gland.
2. Functions and hypo & hyper secretion of hormones of
 - a. Pituitary
 - b. Thyroid
 - c. Parathyroid
 - d. Adrenal
 - e. Endocrine part of pancreas.
3. Spermatogenesis. Functions of Testosterone.
4. Ovarian and Menstrual Cycle and their hormonal control.
5. Hormones of Ovary and their functions.
6. Physiological basis of Fertilization, Implantation, Pregnancy, Parturition and Lactation.
7. Contraception.

14. EXERCISE PHYSIOLOGY

1. Effects of acute & chronic exercises
2. Oxygen/CO₂ transport – O₂ debt.
3. Effects of Exercises on muscle strength, power, endurance, B.M.R., R.Q.- hormonal & metabolic effects- respiratory & cardiac conditioning.
4. AGING.
5. Training, fatigue & recovery.
6. Fitness- related to age, gender, & body type.

Text Books

1. Textbook of physiology- vol. I & II – A.K. Jain.

2. Medical physiology – R.L. Bijani.
3. Concise medical physiology – S.Choudhari.

Reference Books

1. Textbook on medical physiology – Guyton & Hall.
2. Review of medical physiology – Ganong.

Practicals

1. Haematology –[Demonstration only]
2. Study of Graphs

a. Skeletal muscles-

- i. Simple muscle twitch
- ii. Effect of increasing strength on SMT.
- iii. Effect of increasing load on SMT.
- iv. Effect of free load & after load (Starting' aw).
- v. Effect of temperature.
- vi. Effect of two successive stimuli.
- vii. Effect of fatigue.
- viii. Effect of multiple stimuli & tetanus

b. Cardiac muscles-

- i. Simple myocardiogram.
- ii. Effect of temperature on the myocardiogram.
- iii. Effect of drugs.
- iv. All of none law.
- v. Staircase phenomenon.

3. Physiology Fitness

- Breath holding

- mercury column test,

- cardiac efficiency test – Harvard step test – Master step test

1. Recording of arterial blood pressure – effects of change in posture & exercise on A.B.P.
2. Stethography
 - i. Effect of deglutition.
 - ii. Effect of voluntary hyperventilation
 - iii. Effect of exercise.

3. Spirometry

- Lung volumes and capacities.

4. Mosso's finger ergography and bicycle ergography

5. Perimetry

6. Clinical examination of

- Respiratory system.
- Cardiovascular system.
- Central Nervous system.
- Special senses.



Rambladi

PAPER-III : BIOELECTRICAL MODALITIES

Course description

This course will enable the student to understand the basic electricity and medical electronics and its application in electrotherapy instruments.

Course objective

The objective of this course is that after 180 hours of lectures, demonstrations, practical and clinics, the student will be able to describe the principles of generation, circuit diagram and testing of electrotherapy apparatus.

In addition, the student will be able to fulfill with 75% accuracy (as measured in written, oral and practical internal evaluation) the following objectives of the course.

Scheme of examination

Subject	Internal Assessment		University examination			Total
	Theory	Practical	Theory	Viva	Practical	
Bioelectrical Modalities	20	-	80	-	-	100

The examination shall be of 80 marks for medical electronics and electrotherapeutic modalities. Total internal assessment will be 20 Marks. The paper setter and evaluator should be recognized teachers in Physiotherapy after M.P.T. or B.P.T. with five years of teaching experience shall be on the panel of examiner. 50% shall be the passing marks for theory university examination. The pattern of University theory examination will be as under for 80 Max. Marks.

No. and Type of Questions	Marks for each Question	Total Marks
5 very short answer Questions (<i>Answer to be given in 50-60 words</i>)	02	10
4 short answer Questions(<i>Answer to be given in 250-300 words</i>)	10	40
2 essay type Questions(<i>Answer to be given in 450-500 words</i>)	15	30
Total Marks		80

Syllabus contents:-

Medical Electronics

1. A.C. Electricity

Sinusoidal wave from: Frequency, Wavelength, Amplitude and phase of a sine wave, Average & RMS value of a sine wave.

2. D.C. Electricity

Modern concept of electricity: Fundamental of electric charges (Proton and electron), Bound and free electrons, conductors and insulators, current, Static electric charges, charging of an object, potential and capacitance, potential difference and EMF, Quantity of electricity, magnitude of current, Resistance of conductor and Ohm's law, Resistances in series and parallel, Discharging charged object.

Capacitor (condenser):

Electric around a capacitor, charging and discharging a capacitor, type of capacitor with application of each physiotherapy Department.

Rheostat: Series and shunt rheostat with application of each in the physiotherapy department

Effect of electric current: Thermal effect, chemical effect (ionization) and magnetic effect, electric shock, causes and its prevention.

3. Therapeutic Current

Impulse: Definition, types, pulse duration and pulse Repetition time, Interrupted Galvanic Currents faradic current and surged faradic currents.

4. Magnetism

Magnetic and non- magnetic materials, magnet and its poles, the basis of magnetism (Dipole theory), Magnetic lines of force and their properties.

Electromagnetism: Magnetic field around a current carrying conductor, electromagnetic induction, Lenz's law strength of induced EMF, Inductor and inductance, type of inductor, reactance and impedance, Static transformer, mutual inductance.

Even ratio, step-up, step-down and earth free transformers.

Precautions against Earth shock variable and auto transfer.

5. Thermionic valves

Thermionic emission, Diode valves and triode valves and their characteristics and constants.

6. Semi-conductor devices

Intrinsic and extrinsic semi-conductors, advantage of semi-conductors devices over Thermionic valves, semi-conductor diode and transistor.

Biasing of Diode and Diode characteristics.

Light emitting Diodes, Integrated circuits.

7. Electronic circuits

Rectifiers and smoothing circuits.

Sinusoidal and Non-sinusoidal Oscillators.

Pulse generator circuits, short wave diathermy and ultrasound apparatus.

8. A.C. and D.C. Meters

Functions and applications of D.C. current meter, D.C. Voltage meter, series and shunt Ohmmeters, Wheat stone bridge and multi-meter, construction and application of cathode ray oscilloscope.

(Emphasis should be given to theoretical part without mathematical derivations; however, final formula must be written).

ELECTRO-THERAPEUTIC MODALITIES

Introduction to generation, Circuit diagram, testing of apparatus, Indications and Contraindications of.

1. Low frequency currents
2. D.C. currents
3. Medium frequency currents
4. S.W.D. and Pulsed S.W.D.
5. M.W.D.
6. Ultra-Sonics
7. Infrared
8. U.V.R.
9. Laser

(**Note:** Emphasis is given only to generation, circuit diagram and testing of above apparatus).

Practical (Demonstration only)

Diode and triode valves, transistor, ammeter, voltmeter, Galvanometer, Rheostat, Resistance box, Transformer.

Demonstration of possible electrotherapy unit circuits like stimulator, SWD and testing of apparatus etc.

Book References

1. Basic radio by M. Tepper Vol. I' II' III' and V.
2. Fundamentals of physics by verghese, parvathy Sebastian and anatomy (VAS Publication).
3. Modern College Physics by Harvey E. White (CBS Publication).
4. Electronic Principles by A.P. Malvino (Tata McGraw-Hill Publication).
5. Handbook of electronics by Gupta and Kumar (Pragati Prakashan).
6. Technique of Electrotherapy and its physical and physiological basis by Stafford L. Osborne and Harold J. Holmquest.
7. Clayton's Electrotherapy by Angel Forster and Nigel Palestanga.
8. Therapeutic Electricity by Sydney Litch
9. Medical Electronics Book.
10. Electricity and Magnetism by Brijlal and Subramanyam.
11. Electrotherapy and Light Therapy by Kovac's.

A handwritten signature in blue ink, appearing to read "Ramkrishna", with a horizontal line underneath it.

PAPER-IV: BIOMECHANICAL MODALITIES

Course Description

This course will enable the students to understand the basic mechanics and their application in physiotherapy in restoration of physical function.

Course Objective

The objective of the course is that after 180 hours lectures.

Demonstration, practicals and clinics, the student will be able to describe the mechanics and their application in physiotherapy.

In addition, the student will be able to fulfill the 75% accuracy (as measured in written, oral and practical internal evaluation) the following objectives of the course.

Scheme of Examination

Subject	Internal Assessment		University examination			Total
	Theory	Practical	Theory	Viva	Practical	
Biomechanical Modalities	20	-	80	-	-	100

The examination shall be of 80 marks for mechanics and exercise therapeutic modalities. Total internal assessment will be 20 Marks . The paper setter and evaluator should be recognized teachers in Physiotherapy after M.P.T. or B.P.T. with five years of teaching experience shall be on the panel of examiner. 50% shall be the passing marks for theory university examination . The pattern of University theory examination will be as under for 80 Max. Marks.

No. and Type of Questions	Marks for each Question	Total Marks
5 very short answer Questions (<i>Answer to be given in 50-60 words</i>)	02	10
4 short answer Questions(<i>Answer to be given in 250-300 words</i>)	10	40
2 essay type Questions(<i>Answer to be given in 450-500 words</i>)	15	30
Total Marks		80

Syllabus contents:-

MECHANICS

1. Mechanics and Mechanical Principles.

Definition of Mechanics, force, Diagrammatic representation of forces, Measurement of forces, classification of forces, Coplanar and parallel forces, Composition and Resolution of forces.

Momentum, Action and Reaction, Friction, Rotation about a Pivot.

Angle of Pull of Muscle, Assistance and Resistance of Movements.

Moment of a force and practical application.

Gravity

Definition, Line of gravity, Center of Gravity.

Equilibrium. Supporting base, Stability of equilibrium.

Energy Work and Power

Energy (Potential and Kinetic), work and Power.

Levers

Lever, Action of the lever, Position of the fulcrum, Orders of Levers, Tools and Other Mechanical devices Pulley block.

Elasticity

Definition, Stress, Strain, Hook's law, springs, Properties of Springs, springs in series and parallel.

2. Hydrostatics and Hydrodynamics

Archimede's principle

Properties of water, liquids, pressure.

Buoyancy, Laws of Floatation.

Apparent loss in weight, factors determining up-thrust, effect of buoyancy on movement performed in water.

Movement of force, further effects of apparent loss in weight.

Equilibrium of floating body, movement of water, Inertia, Movement of Objects in water.

Bernoulli's theorem and its application in Atomiser or syrayer.

(Only qualitative explanation of the above).

EXERCISE THERAPEUTIC MODALITIES

1. Introduction

2. Aim and scope of biomechanical modalities, examples of different type of modalities.

3. Mechanics and Mechanical principles

- a. Mechanical Principles applied in physiotherapy like force, momentum, torque etc.
- b. Mechanics of position, gravity, line of gravity and center of gravity in human body, base equilibrium, fixation and stabilization.
- c. Mechanics of movement – axes and planes, the plane of movement and gravity
- d. **Lever:** definition, order of lever, examples in human body, levers at home and its work, levers in physiotherapy.
- e. **Pulleys:** Different type of pulleys and their uses in physiotherapy.
- f. **Elasticity:** Elastic materials used in physiotherapy like springs (in detail), Rubber elastic and Sorbo rubbers.
- g. Hydrostatic and hydrodynamic principles used in Hydrotherapy.

Practicals

(Demonstration of the following)

1. Mechanical principles applied in physiotherapy like force, Torque center of Gravity etc.
2. Demonstration of different types of lever in human body
3. Demonstration of different types of pulleys and springs used in physiotherapy.
4. Demonstration of axial and pendular.
5. Demonstration of Archimedes's principle of floatation and Bernoulli's Therrem's application in Hydrotherapy.

Book Reference

1. Principles of exercise therapy by Dena Gardner.
2. Practical exercise therapy by Margaret hollies.
3. Krusen's textbook of physical medicine and rehabilitation by krusen kortke.
4. Muscle testing by Daniel.
5. Clayton's electrotherapy.
6. Elements properties of matter by D.S. Mathur.



PAPER-V: SOCIOLOGY AND PSYCHOLOGY

SCHEME OF EXAMINATION

Subject	Internal Assessment		University Examination			Total
	Theory	Practical	Theory	Viva	Practical	
Sociology & Psychology	20	--	80	--	--	100

The University examination shall be of 80 marks with **Section – A: Sociology** and **Section – B : Psychology** the university theory examination marks for Sociology shall be 40 and for Psychology 40 marks respectively. There shall be two paper setters and two evaluators, one from Sociology and one from Psychology . Section- A (40 marks), which will be set by Sociology examiner and Section-B (40 marks), by Psychology examiner. Recognized teachers in Sociology and Psychology with five years of experience shall be on the panel of examiners , 50% shall be the minimum passing marks. Internal assessment will be of 10 marks in each subject. Total internal assessment will be 20 Marks. The pattern of University theory examination will be as under for **80 Max. Marks**. There will be two section i.e. Section-A: Sociology and Section-B: Psychology of **40 Max. Marks each section** and distribution of marks for questions will be as under –

No. & Type of Question	Marks for each question	Total Max. Marks
5 Very Short Answer Questions (<i>Answer to be given in 50-60 words</i>)	02	10
2 Short Answer Questions (<i>Answer to be given in 250-300 words</i>)	08	16
1 Essay Type Questions (<i>Answer to be given in 450-500 words</i>)	14	14
Total Marks		40

PAPER-V

SECTION-A: SOCIOLOGY

INSTRUCTIONS OF PAPER SETTER-

Distribution of marks for questions will be as under –

No. & Type of Question	Marks for each question	Total Max. Marks
5 Very Short Answer Questions (<i>Answer to be given in 50-60 words</i>)	02	10
2 Short Answer Questions (<i>Answer to be given in 250-300 words</i>)	08	16
1 Essay Type Questions (<i>Answer to be given in 450-500 words</i>)	14	14
Total Marks		40

Course description

This course will introduce students to the basic sociological concepts principles and social processes, social institutions (in relation to the individual, family and community) and the various social factaffecting the family in rural and urban communities in India.

A. Introduction

1. Meaning, Definition and scope of sociology. 2. Its relation with anthropology, psychology, social psychology and ethics. 3. Methods of sociology – case study, social survey, Questionnaire, Interview and opinion poll methods. 4. Importance of its study with special reference to health care professional.

B. Social Factors in health and disease

1. The meaning of social factors,
2. The role of social factors in health and illness.

C. Socialization

1. Meaning and nature of socialization.
2. Primary secondary and anticipatory socialization.

3. Agencies of socialization.

D. Social Groups

Concepts of social group, influence of formal and informal group on health and sickness. The role of primary group and secondary group in hospital and rehabilitation setting.

E. Family

1. The family,
2. Meaning and definition,
3. Functions,
4. Types,
5. Changing family,
6. Influence of family on the individual's health, family and nutrition, the effects of sickness on family and psychosomatic disease and their importance to physiotherapy.

F. Community

1. Rural community – Meaning and features, health hazards of ruralites,
2. Urban community – meaning and features, health hazards of Urbanites.

G. Culture and Health

1. Concepts of culture,
2. Cultures and Behaviour,
3. Cultural meaning of sickness,
4. Culture and Health disorders.

H. Social change

1. Meaning of social change,
2. Factors of social change,
3. Human Adaptation and social change,
4. Social change and stress,
5. Social change and deviance,

6. Social change and health programme,
7. The role of planning in the improvement of health and in rehabilitation.

I. Social Problems of Disabled

Consequences of the following social problems in relation to sickness and Disability, remedies to prevent these problems.

1. Population Explosion,
2. Poverty and Unemployment,
3. Beggary,
4. Juvenile Delinquency,
5. Prostitution,
6. Alcoholism,
7. Problems of Women in employment.

J. Social Security

Social Security and Social Legislation to the disabled.

K. Social Worker

1. Meaning of social Work,
2. The role of a medical social worker.

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PAPER-V

SECTION-B: PSYCHOLOGY

INSTRUCTIONS OF PAPER SETTER-

Distribution of marks for questions will be as under –

No. & Type of Question	Marks for each question	Total Max. Marks
5 Very Short Answer Questions (<i>Answer to be given in 50-60 words</i>)	02	10
2 Short Answer Questions (<i>Answer to be given in 250-300 words</i>)	08	16
1 Essay Type Questions (<i>Answer to be given in 450-500 words</i>)	14	14
Total Marks		40

SYLLABUS CONTENTS:-

GENERAL PSYCHOLOGY: THEORY.

1. What is psychology! Field of application and methods of study of psychology.
2. The respective influences of heredity and environment on the individual.
3. Development and growth of behaviour in infancy and childhood.
4. Motivation: Achievement, affiliation and aggression Maslow's theory.
5. Emotions and emotional development.
6. Learning theories, methods of learning (Pavlov, Thorndike, Hull- Tolman).
7. Learning and maturation – special reference to conditioning positive and negative reinforcement interest and in learning.
8. Sensation, perception.
9. Social psychology, influence of individual or groups on behavior of others leadership and group psychology.
10. Memory, thinking and causes of forgetting.

CLINICAL PSYCHOLOGY: THEORY

1. **Introduction:** Field of application and short history of clinical psychology.
2. **Concept of mind:** Conscious and unconscious mind (psychological approach).
3. **Intelligence** and intelligence testing, kinds of mental deficiency.
4. **Personality:** Concept, influencing factors and tests.
5. **Major psychological disorders:** Psychoneurosis

- a. Anxiety
 - b. Phobia
 - c. Obsessive-compulsive reaction.
6. **Major psychological disorders:** Psychosis
- a. Schizophrenia
 - b. Depression
7. Psychosomatic disorders, personality disorders
8. Frustration and conflict.
9. **Stress:** Coping mental mechanism with special reference to normal and abnormal conditions.
10. Counseling: Process, approaches.
- a) Directive
 - b) Non-directives
 - c) Counseling skills.

Book References

Clinical Psychology by Kuleman.

A handwritten signature in cursive script, appearing to read "Ramkrishna", with a horizontal line underneath it.

Date: 12-12-2016