# INTEGRAL UNIVERSITY
## DEPARTMENT OF PHYSIOTHERAPY
### Scheme of Examination
**TIMING** - 3 HOURS (THEORY PAPERS)
Distribution of Marks in B.P.Th. First Year shell be given below

<table>
<thead>
<tr>
<th>S. N.</th>
<th>Subject</th>
<th>Code</th>
<th>Internal Assessment</th>
<th>University Exam</th>
<th>Total Marks</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Human Anatomy</td>
<td>B.P.Th.101</td>
<td>25 25</td>
<td>100 40 60</td>
<td>250</td>
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<tr>
<td>2.</td>
<td>Human Physiology</td>
<td>B.P.Th.102</td>
<td>25 25</td>
<td>100 40 60</td>
<td>250</td>
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<td>3.</td>
<td>Biochemistry</td>
<td>B.P.Th.103</td>
<td>25 25</td>
<td>100 20 30</td>
<td>200</td>
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<td>4.</td>
<td>Sociology</td>
<td>B.P.Th.104</td>
<td>25 -</td>
<td>75 - -</td>
<td>100</td>
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<td>5.</td>
<td>Basis of Electrotherapy &amp; Biomechanics</td>
<td>B.P.Th.105</td>
<td>25 25</td>
<td>100 40 60</td>
<td>250</td>
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<tr>
<td>6.</td>
<td>Computer Application</td>
<td>B.P.Th.106</td>
<td>25 25</td>
<td>50 - -</td>
<td>100</td>
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**Total Marks** 1150
B.P.Th. 101 HUMAN ANATOMY

Microscopic, Macroscopic, Radiological and Surface Anatomy of the Following:

1. **Cells & Tissues**
   a. Anatomical Nomenclature
   c. Tissues: Epithelia, Connective, Muscle & Nervous

2. **Embryology & Development**
   a. Early Human Development.
   c. Prenatal Growth in Form and Size.
   d. Neonatal Anatomy and Growth.

3. **Skin**
   a. Types of Skin, Epidermis, Dermis, Nerves, Blood Vessels, age related changes.
   b. Appendages of Skin: Pilosebaceous Unit, Nail Unit.

4. **Skeletal System**
   b. Skeletal Connective Tissues: Structure of Cartilage, Bone as a Tissue, Microscopic Structure and Organization of Bone, Blood Vessels and Nerves of Bone.
   c. Types of Joints:
   d. Axial Skeleton: Vertebral Column, Ribs, Sternum, Skull.
   e. Appendicular Skeleton: upper limb, Lower Limb.

5. **Muscle**
   a. Types of Muscle, Attachments of Skeletal Muscle
   c. Muscle and Movement.
   d. Muscles and Fasciae of Head, Neck, Trunk, Upper Limb, Lower Limb.

6. **Nervous System**

7. **Hemolymphoid and Cardiovascular System**
   b. Blood Vessels, Thoracic Cavity and Heart.

8. **Respiratory System**
   a. Nose and Paranasal Sinuses, Larynx, trachea.
   b. Bronchi, Pleura, Mediastinum

9. **Alimentary System**
   a. Oral cavity, Abdomen,
   b. Oesophagus to Anus

10. **Urinary and Reproductive System**
    a. Kidneys, Ureter, Bladder, Urethra.
    b. Reproductive organs of Male and Female.

11. **Endocrine System.**
    b. Adrenal Gland, Paraganglion, Paraaortic Bodies, Tympanic Bodies, Coccygeal Body.

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**B.P.Th. 101P: ANATOMY PRACTICAL**

1. Surface Anatomy: Identification and Description of surface land marks on
Human Specimen.
2. Muscles, Bones Ligaments, Joints of head, face, trunk lower and upper extremities on a dissected human specimen.
1. **Functional Systems of Cell**
   a. Cell and its Function
   c. Functional Systems of Cell, DNA, RNA.
   d. Control of Genetic Function and Biochemical Activity in Cells.
   e. Cell Differentiation, Cancer.

2. **Membrane Physiology, Nerve and Muscle**
   c. Contraction of Skeletal Muscle: Molecular Mechanics of Muscle Contraction, Energetics of Muscle Contraction, Characteristics of Whole Muscle Contraction,
   d. Contraction and Excitation of Smooth Muscles.
   e. Hormonal Control of Smooth Muscle Contraction.

3. **Heart and Circulation**
   a. Cardiac Muscle, Cardiac Cycle, Regulation of Heart Pumping Cardiac Failure.
   c. Normal ECG, Methods of Recording, ECG Leads.
   d. Heart Sounds.
Control of Blood Flow, Humoral and Nervous Regulation of Circulation, Cardiac Output, Venous Return Arterial Pressure and their Regulation.

g. Circulatory Shock.
h. RBCC, Anemia, Polycythemia, WBC, Resistance of body to Infection, Blood Groups.
i. Homeostasis and Blood Coagulation.

4. **Kidney and Body Fluids.**
   b. Urine Formation by the Kidneys Nephron, Glomerular Filtration, Renal Blood Flow, Tubular Reabsorption.
   c. Regulation of ECF Osmolarity and Sodium Concentration.
   d. Integration of Renal Mechanisms for Control of Blood Volume and ECF Volume.
   e. Renal Regulation of Potassium, Calcium, Phosphate and Magnesium, Regulation of Acid – Base Balance.
   f. Diuretics.

5. **Respiration**
   b. Pulmonary Circulation, Pulmonary Edema, pleural Fluid.
   d. Regulation of Respiration
   e. Respiratory Dysfunction.

6. **Aviation, Space and Deep Sea Diving Physiology**
   a. Effect of Low Oxygen Pressure on the Body, Mountain Sickness, Effects of Acceleratory Forces, Artificial Climate, Weightlessness in Space effects of High Partial Pressure of Gases on the Body,
   b. Hyperbaric Oxygen Therapy.

7. **Nervous System**
a. Sensory Receptors, Neuronal Circuits for Processing Information.


c. Special Senses.


e. Cortical and Brain Stem Control of Motor Function: The Motor Cortex, Corticospinal Tract, Vestibular Sensations and Maintenance of Equilibrium.

f. Cerebellum, Basal Ganglia, Motor Control Integration of the many parts of the total Motor Control System.

g. Intellectual Functions of the Brain Learning and Memory.

h. Behavioral and Motivational Mechanisms of the Brain the Limbic System, Hypothalamus.

i. States of Brain Activity: Sleep, Brain waves Epilepsy, Psychoses.

j. Autonomic Nervous System.

k. Cerebral Blood Flow, CSF and Brain Metabolism.

8. Gastrointestinal System
   a. Motility, Nervous Control, Blood Circulation
   b. Propulsion and Mixing of Food
   c. Secretary Functions.
   d. Digestion and Absorption.

9. Endocrinology and Reproduction
   a. Hormone Secretion, Transport and Clearance from Blood.
   b. Hormones: Pituitary Thyroid Adrenocortical Insulin Parathyroid, Reproductive.
   c. Puberty, Menarche, Menopause
   d. Pregnancy of Lactation
   e. Fetal and Neonatal Physiology: Special Functional Problems of Neonate, Pre-maturity.

10. Physiology of Exercise and Work
    a. Neuromuscular activity human movement, physiological mechanism in movement, behavior strength, endurance, & analysis of movement.
b. Circulatory and respiratory response to exercise including effects on the heart, blood circulation, body fluid changes pulmonary ventilation, gas exchange and transport etc.

c. Effects of exercise and work on other body functions.

d. Metabolic and environmental aspects of exercise and work – metabolism, energy requirement, efficiency of muscular work, nutritional aspects, heat and body temperature regulation and environmental factors.

e. Effects of Exercise training – endurance, fatigue and recovery.

f. Fitness and health – age, sex, body type, race stress and medical aspects of exercise.
B.P.Th. 102P: PHYSIOLOGY PRACTICAL

1. Introduction of Microscope
2. Identification of blood cells and differential counts
3. W.B. C. count
4. R. B. C. count
5. Hemoglobin percentage and color index
6. E.S.R. and Blood Group
7. Bleeding time and clotting time.
8. Respiratory efficiency tests.
9. Artificial respiration and C.P.R.
10. Pulse rate, Heart rate and measurement of Blood Pressure.
11. Respiratory rate and Auscultation
12. Normal E.C.G.
13. Reflexes- Superficial and Deep
15. Tests for functions of Cerebrum
16. Tests for functions of Cerebellum
UNIT I
Cell


UNIT II
Protein

Definition, Classification, properties & functions of aminoacids, classification, properties & biological importance of proteins, structure of proteins, Amino acid & protein metabolism.

UNIT III
Enzymes

Definition, Classification, properties, mechanism of action, clinical importance & regulation of activity.

UNIT IV
Carbohydrate

Definition, Classification & Metabosis Glycolsis, Citric Acid cycle, gluconeogenesis, glycogenesis, Glycogenolysis, Pentose Phosphate Pathway, Blood Sugar level & its homeostasis, glucose tolerance & glycosuria.

UNIT V
Lipid

Definition, Classification & functions of lipids – triglycerids, fatty acids, saturated, unsaturated fats, phospholipids & cholesterol, eicosanoids Beta – oxidation & ketone bodies metabolism.

UNIT VI
Vitamins (fat & water soluble)

Definition, classification, functions dietary sources, daily requirement & deficiency disorders.

UNIT VII
Nucleic Acid

Structure of DNA & RNA, DNA Replication, & Transcription, Advances in Genetic Engineering.
UNIT VIII
Hormones
Introduction Definition & Classification of hormones. Mechanism of hormone action, Effects of hormones on various metabolism & hormonal disorders.

UNIT IX
SPECIAL TOPICS
b) Nutrition–Introduction, Nutrients of their role in human, Nutritional requirements Balance diet, Nutritional disorder, SDA (special dynamic action), Respiratory quotient (RQ) & Basal Metabolism rate (BMR).
B.P.Th.103P: BIOCHEMISTRY

PRACTICAL

1. Qualitative estimation of carbohydrates
   a) Benedict’s test
   b) Molishs
   c) Phenol Sulfuric Acid

2. Quantitative estimation of proteins.
   a) Lowry Method
   b) Bradford test

3. Quantitative Estimation of
   a) Glucose concentration
   b) Urea concentration
   c) Cholesterol Concentration

4. Chromatography
   a) TLC (Thin layer chromatography) & Paper chromatography
1. Introduction
Definitions of sociology, Sociology as a science of society, uses of the study of sociology, application of knowledge of sociology in physiotherapy.

2. Sociology and Health
Social Factors affecting health status, social consciousness and perception of illness, social consciousness and meaning of illness, decisions making in taking treatment Institutions of health, their role in the improvement of the health of the people.

3. Socialization
Meaning of socialization, influence of social factor on personality, socialization in hospitals, socialization in the rehabilitation of patients.

4. Social Groups
Concepts of Social groups, influence of formal and informal groups on health and sickness, the role of the primary groups and secondary groups in the hospitals and rehabilitation settings.

5. Family
Influence of family on human personality, discussion of chares in the functions of a family on the individuals health family and nutrition the effects of sickness on family and psychosomatic disease.

6. Community
Concept of community, role of rural and urban communities in public health, role of community, in determining beliefs, practices and home remedies in treatment.

7. Culture
Components of culture, impact of culture, on human behavior, cultural meaning of sickness, response of sickness, and choice of treatment, (role of culture as social consciousness in moulding the perception of reality), culture induced symptoms and disease, sub-culture of medical workers.

8. Caste System
Features of the modern casts system and its trends.

9. Social Change
Factor of Social change, human adaptation and social change, social change and stress, social change and deviance, social change and health programs the role of social planning in the improvement of health and in rehabilitation.
10. Social Control
Meaning of social control role of norms, folkways, customs morals religions law and other means of social control in the regulation of human behavior, social deviance and disease.

11. Roles
Role taking and making, concepts of role, multiple roles, role set, role conflicts, role loss, and transition, role and health.

12. Organization
Goals and functions, organization as systems, organizational impact – individual, family community, social structure, power and control in organizations, feminist perspectives on organizations.

13. Sex, gender and feminism
Social construction of sex and gender sex / gender roles, feminist critiques of sociology.

14. Work
Work culture and work, theories of work, unemployment, women and work.

15. Leisure
Conceptual and methodological

16. Social Problems of the Disabled
Consequences of the following social problems in relation to sickness and disability remedies, to prevent these problems.

a) Population explosion
b) Poverty and unemployment
c) Beggary
d) Juvenile delinquency
e) Prostitution
f) Alcoholism
g) Problems of women in employment
h) Social of the health profession.
i) Various perspectives, power and autonomy in professions, women and professions.

17. Social Security
Social Security and social legislation in relation to the disabled.

18. Social Worker
B.P. Th. 105: Basis of Electrotherapy & Biomechanics

SECTION I BASIS OF ELECTROTHERAPY

1. **Physical principles**
   a) Structure and properties of matter – solids, liquids and gasses, adhesion, surface tension, viscosity, density and elasticity.
   b) Structure of atom, molecules, elements and compounds
   c) Electron therapy static and current electricity
   d) Conductors, Insulators, Potential difference, Resistance and intensity.
   e) Ohm’s Law – Its application to AC & DC currents.
   f) Rectifying Devices Thermionic Valves, Semiconductors, Transistors, Amplifiers, Transducer and Oscillator circuits.
   g) Capacitance condensers and in DC and AC circuits.
   h) Display devices and indicators – analogue and digital.

2. **Effects of Current Electricity**
   a) Chemical effects- ions and electrolytes, ionization, Production of an EMF by chemical actions.
   b) Magnetic effects, Molecular theory of magnetism, Magnetic fields Electromagnetic Induction.
   c) Milli Ammeter and voltmeter transformers and choke coil
   d) Electromagnetic spectrum.

3. **Electrical Supply**
   a) Brief outline of main supply of electric current
   b) Dangers- short circuit, electric shocks.
   c) Precaution – safety devices, earthing fuses etc.
   d) First aid and initial management of electric shock.

4. **Various agents**
   a) Thermal agents Physical Principles of cold, Superficial and deep heat.
   b) Ultrasound: Physical Principles of Sound.
   c) Electromagnetic Radiation Physical Principles and their Relevance to Physiotherapy.
   d) Electric Currents: Physical Principles and their Relevance to Physiotherapy Practice.

5. **Circuit Diagrams.**
   a) SWD
   b) US
   c) MWD
   d) LASER.
SECTION II BASIS OF BIOMECHANICS

Definitions, Units, Classifications, Effects and Physiotherapy Application of the Following:

1. **Mechanical Basis of Movement**

2. **Skeletal Basis of Movement**
   - Planes and Axes, Joints and their Classification, Classification of Movement, Degrees of Freedom, Bones and their Classification.

3. **Musculoskeletal Basis of Movement**
   - Structure of Muscle and its Classification, Muscle Tension, Muscle Fiber Group Action of Muscles, Torque & angle of pull.

4. **Gravity**
   - Effects, Centre of gravity, Line of Gravity and their Alterations, Role in Human Body and Movement.

5. **Equilibrium**
   - Effects, Supporting Base, role in Human Movement.

6. **Simple Machines**
   - Levers and their Functions and classification, Pulleys and their Functions and classification, Inclined Planes and their Functions and classification.

7. **Elasticity**
   - Stress, Strain, Hooke’s Law Springs and their properties.

8. **Hydrostatics and Hydrodynamics**
   - Principles & Application

9. **Fundamental and Derived Positions**

10. **Traction**
B.P.Th.105P: Basis of Electrotherapy & Biomechanics Practical

SECTION I BASIS OF ELECTROTHERAPY

Diode and Triode valves, Transistors, Ammeter, Voltmeter, Galvanometer, Rheostat, Resistance Box, Transformer etc.

1. Demonstrations of circuits in Electrotherapy units like stimulator, SWD, LASER and Ultrasound, etc.

SECTION II BASIS OF BIOMECHANICS

1. Mechanical Principles applied in Physiotherapy like force, Torque, Centre of Gravity, etc.

2. Demonstration of different types of leavers in the human body.

3. Demonstration of different types of pulleys and strings used in Physiotherapy.

4. Demonstration of Archimedes’ Principle of floatation and Bernoulli’s Theorem in Hydrotherapy.

5. Demonstration of axial and pendular suspension.
UNIT 1

Introduction to Computer:

Definition, Architecture of Computers, Processor, HDD, FDD, RAM, ROM, firmware & Human Ware, Motherboard, Tapes Printers- it types Monitor, Networks types and topology. Application of Computers. Maintenance and handling other machines and storage device like CD, Floppy etc.

UNIT 2

GENERATIONS OF THE COMPUTERS

Features of computers, Data, information, and knowledge – Data processing, latest trends and configuration of Computers.

UNIT 3

SOFTWARE CONCEPT

Definition of S/W types and classification operating system definition, types, installation, viruses anti virus uses and its use. MS Office – Excel, Word, power power point access.

UNIT 4

Basic knowledge of Utility of Multimedia.

UNIT 5.

IT Technology

IT Technology: - Defines uses, Internet, Search Engine, Websites, Email creation & Chat introduction to HTML, JAVA, ASP
1. Demonstration of Introduction of Computer (CPU, RAM, Monitor, HDD, FDD, ROM)
3. Demonstration of Installation of Various anti virus and other office tools.
5. Demonstration of Basic knowledge of Internet and make there personal E. mail ID.
6. Demonstration of Explore some Educational Sites.
UNIT-I

The multidisciplinary nature of environmental studies. Definition, scope and importance, need for public awareness

Natural Resources

Renewable and non renewable resources

Natural resources and associated problem

a. Forest resources: use and exploitation, deforestation, case studies, timber extraction, mining, dams and their effects on forests and tribal people
b. Water resources: use and over utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problem
c. Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources, case studies.
d. Flood resources: world food problem, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer pesticide problems, water logging, salinity, case studies.
e. Energy resources: growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies
f. Land resources: land as resource, land degradation, man induced landslides, soil erosion and desertification.
g. Role of an individual in conservation of natural resources.
h. Equitable use of resources for sustainable lifestyle

Unit II

Ecosystems

- Concept of an ecosystem
- Structure and function of an ecosystem
- Procedures, consumers and decomposers
- Energy flow in ecosystem
- Ecological succession
- Food chain, food webs and ecological pyramids
• Introduction, type, characteristics, features. Structure and function of the following ecosystem
  a) Forest ecosystem
  b) Grassland ecosystem
  c) Desert ecosystem
  d) Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT III

Biodiversity and its conservation

Introduction Definition: genetics, species and ecosystem diversity, biogeographical classification of India, value of biodiversity: consumptive use, productive use, social ethical, aesthetic and option values, biodiversity at global, national and local levels, India as megadiversity nation, Hot spots of biodiversity. Threats to biodiversity: habitat loss, Poaching of wildlife, man wildlife conflicts, Endangered and endemic species of India, conservation of biodiversities: In situ Ex situ conservation of biodiversities

Unit-IV

Environmental Pollution

Definition

• Causes, effects and control measures of
  a) Air pollution
  b) Water pollution
  c) Soil pollution
  d) Marine pollution
  e) Noise pollution
  f) Thermal pollution
  g) Nuclear hazards

• Solid waste management: cause, effects and control measures of urban and industrial wastes

• Role of individual in prevention of pollution

• Pollution case studies

• Disaster management: flood, earthquake, cyclone and landslides
UNIT V

Social issues and the environment

From unsustainable to sustainable development, urban problems related to energy, water conservation, rain water harvesting, watershed management and rehabilitation of people: its problems and concerns, case studies, Environmental ethics: issues and possible solution, wasteland reclamation, consumerism and waste product, Environment protection Act, Air(prevention and control of pollution) act, water (prevention and control of pollution) wild life protection act, forest conservation act, issues involved in enforcement of environment legislation, Public awareness

Human Population and the Environment


Suggested Field work

Visit to local area to document environment assets river/forest/grassland/hill mountain, visit to local polluted site urban/rural/industrial/agricultural, study of common plants, birds, study of simple ecosystem pond, river hill slopes etc.

References

2. Bharucha Erach, The Biodivesity of India, Mapin Pub. Pvt Ltd
5. Cunningham, W.P. Cooper, T.H. Gorahani, E & Hepworth, M.T.2001
   Environmental Encyclopeda, Jaico Pub. House Mumbai,1196 page
6. De.A.K. Environmental Chemistry, Willey Eastern Ltd,
7. Down to Earth, Centre for Science and Environment
8. Glick, H.P. 1993 Water in crisis, Pacific Institute for Studies inn dev,Enviornment & security, Stockholm Env, Institute, Oxford Univ
9. Hawkions R.E. Encyclopeda of India Natural History, Bombay Natural History Society, Bombay(R)