

# **VEER NARMAD SOUTH GUJARAT UNIVERSITY**

## **BACHELOR OF PHYSIOTHERAPY ( B. Physiotherapy )**

**In Effect From 2005-06**

**Subjects during the four-year study of B. Physiotherapy:**

### **First year**

- (1) Human Anatomy**
- (2) Human Physiology**
- (3) Psychology & Sociology**
- (4) Fundamentals of Bio- Medical physics**
- (5) Exercise Therapy - I & Soft tissue manipulations**
- (6) English**

# VEER NARMAD SOUTH GUJARAT UNIVERSITY

## BACHELOR OF PHYSIOTHERAPY

**First Year**  
**2005-2006**

Structure of Question paper for subject Human Physiology, Anatomy, Psychology (section 1) & Sociology (section 2), Bio Medical Physics, Exercise Therapy-I & STM.

Examination Weight age: 70 marks

Internal Assessment: 30 marks

TOTAL MARKS 70

### SECTION – I

|   |    |
|---|----|
| QUESTION: 1: Full Question                | 8  |
| OR  |    |
| QUESTION: 1: Full Question                |    |
| QUESTION: 2: Short Question (2 out of 3)  | 10 |
| QUESTION: 3: Short Notes (2 out of 3)     | 8  |
| QUESTION:4: Very Short notes (3 out of 5) | 9  |

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TOTAL: 35  
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### SECTION – II

|   |    |
|---|----|
| QUESTION: 1: Full Question                | 8  |
| OR  |    |
| QUESTION: 1: Full Question                |    |
| QUESTION: 2: Short Question (2 out of 3)  | 10 |
| QUESTION: 3: Short Notes (2 out of 3)     | 8  |
| QUESTION:4: Very Short notes (3 out of 5) | 9  |

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TOTAL: 35  
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Structure of question paper for English

Examination Weight age: 35 marks

Internal Assessment: 15 marks

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TOTAL: 35

# VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

## BACHELOR OF PHYSIOTHERAPY

### First Year

#### HUMAN ANATOMY

**Note :** Emphasis to be placed on topographical, Skeletal, Neuromuscular and functional aspects of anatomy, Students must take part in dissections to identify various structures.

#### **General Introduction:**

1. Definitions, terms and Subdivisions.
2. Plan of the human body.
3. System of the body.
4. The unit of structure and function – the cell.

#### **Osteology:**

1. Terminology: Anatomical position, planes, surface relationship of parts of the body- proximal, distal etc.
2. Bones: Type of bones, formation, function, growth and repair, structure of long bone, vertebral, column, types of vertebrae, bones of extremities and bony landmarks.

#### **Arthology :**

1. Classification of joints.
2. Construction of joints.
3. Motions of joints.
4. Articulation – Articular Surfaces, types of joints, motions of upper of and lower extremities, trunk & head.

#### **Myology :**

1. Types of muscle tissue.
2. Muscles of upper extremity, lower extremity, trunk, eye, face etc. Origin, Insertion, nerve supply and actions ( in detail ).

#### **Cardiovascular System:**

1. Blood, lymph, tissue fluid – characteristics, composition, function.
2. The heart- main arteries, Veins, capillaries.
3. Lymph circulation.

#### **Nervous System:**

1. Division and function of the nervous system.
2. Nerve tissue – neuron, nerve fiber, synapse, end organs etc.
3. Spinal cord, Brain – their structures, divisions.
4. Peripheral and cranial nerves and their distribution, special emphasis on nerve supply to voluntary muscles, segmental distribution.
5. Cerebrospinal fluid.
6. Sensory end organs and sensation.
7. Autonomic nervous system – sympathetic, parasympathetic.

### **Respiratory System :**

1. Anatomy of respiratory organs – air passages, lungs, bronchial tree etc. Relation with diaphragm and thoracic cage.

### **Digestive System :**

1. Anatomy of digestive organs- esophagus, stomach, intestine, rectum etc.
2. The digestive glands.

### **Urinary System :**

1. Anatomy of urinary organs- kidneys, ureter, urinary bladder etc. Emphasis on types of bladder in paraplegics.

### **Endocrine System :**

1. Glands, secretion, enzymes, hormones.

### **Reproductive System :**

1. Outline of reproductive system-male and female reproductive organs.

### **Special sensory organs and sensations:**

1. Emphasis on Skin, ear and eyes, less detail on smell and taste.

### **Histology :**

1. Cell, tissues of the body epithelium, connective tissue, cartilage, bone, blood, lymph, muscles and nerves.

### **General Embryology :**

1. Ovum, spermatozoa, fertilization, differentiation, development of musculoskeletal system, central nervous system.

### **Practical Work:**

Dissection:

Dissection of upper and lower extremities, back, anterolateral abdominal wall.

Identification and description of all anatomical structures surface marking.

### **Human Anatomy**

|                     |            |
|---------------------|------------|
| Theory              | 70 (3hrs.) |
| Internal Assessment | 30         |
| Practical           | 70         |
| Internal Assessment | 30         |

### **SUBJECT: HUMAN ANATOMY**

| <b><u>No.</u></b> | <b><u>Name of books</u></b> | <b><u>Name of author</u></b> | <b><u>Type</u></b> |
|-------------------|-----------------------------|------------------------------|--------------------|
| 1.                | Human Anatomy               | B.D.Chaurasia                | Text               |
| 2.                | Practical Human Anatomy     | Cunningham                   | Text               |
| 3.                | Grays Anatomy               |                              | Reference          |
| 4.                | ELBS atlas of human anatomy |                              | Reference          |

# VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.

## BACHELOR OF PHYSIOTHERAPY

### First Year

## HUMAN PHYSIOLOGY

### General Physiology :

1. Cell Structure and organelle.
2. General Principles of Biophysics.
3. Body Fluid compartments.

### Blood :

1. Composition of blood, plasma, protein formation and their function.
2. Structure formation and functions of R.B.C.
3. Structure formation and functions W. B. Cs. and platelets.
4. Coagulation and its defects - bleeding & clotting time.
5. Blood groups and their significance Rh. Factor.
6. Reticulo endothelial system, Jaundice, Structure and functions of spleen.
7. Hemoglobin and E.S.R.

### Cardiovascular System :

1. Structure ,properties of Heart muscle and nerve supply of heart, structure and function of arteries, capillaries and veins.
2. Cardiac cycle and heart sounds.
3. Cardiac output measurement, factors affecting it.
4. Heart rate and its regulation, cardio vascular regulation.
5. Blood pressure its regulations and physiological variations.
6. Peripheral resistance, factors controlling, role in B.P.
7. Hemorrhage.
8. Changes in muscular exercise.

### Respiratory System:

1. Mechanism of respiration, Intra-pleural and intra pulmonary pressure.
2. Lung volumes and capacities.
3. O<sub>2</sub> and CO<sub>2</sub> carriage and their exchange in tissues and lungs.
4. Nervous & chemical regulation of respiration – Respiratory centers, Respiratory state – Anoxia, Asphyxia, Cyanosis, Acclimatization.

### Digestive System :

1. General outline and salivary digestion.
2. Gastric secretion and its mechanism of secretion and functions.
3. Mechanism of secretion of succus entericus and pancreatic juice and its functions.
4. Structure, Secretions and Functions of liver.

### Nutrition :

1. Digestion, absorption and metabolism of carbohydrates.
2. Digestion, absorption and metabolism of fats.
3. Digestion, absorption and metabolism of proteins.
4. Vitamins, sources, functions and resources.
5. Balanced diet in different age group and occupation.

### **Endocrine system :**

1. Anterior pituitary
2. Post Pituitary and parathyroid.
3. Thyroid.
4. Adrenal Cortex.
5. Adrenal Medulla, Thymus.
6. Pancreas and Blood sugar Regulation.

### **Reproductive System :**

1. Sex determination and development, puberty.
2. Male sex hormones and their functions, spermatogenesis.
3. Female sex hormones and functions, menstrual cycle, ovulation and contraceptives.
4. Pregnancy, functions of placenta and lactation.

### **Excretory System :**

1. Gross and minute structure of kidney and features of renal circulation.
2. Mechanism of formation of Urine, G.F.R. and Tubular function.
3. Renal function tests.
4. Physiology of micturition.

### **Neuro Muscular Physiology :**

#### **Muscle and Nerve :**

1. Structure of neurons, membrane potential and generation of action potential.
2. Nerve impulse conduction, saltatory conduction.
3. Neuromuscular junction and drugs acting on it – Myasthenia gravis.
4. Degeneration and regeneration in peripheral nerves – Wallerian degeneration, electro tonus and flagers law.

#### **Muscle:**

1. Type of muscles and their gross structure, stimulus, Chronaxie, strength duration curve.
2. Structure of Sarcomere – basis of muscle contraction, Starlings law, changes during muscle contraction.
3. Electrical – Biphasic and monophasic action potentials.
4. Chemical, Thermal and physical changes isometric & isotonic contraction.
5. Motor units and its properties. Clonus, tetanus, all or none law, beneficial effect.
6. Nature of voluntary contraction ,fatigue.

#### **Nervous System:**

1. Types and properties of receptors, types of sensations.
2. Structure of synapse, reflex arc and its properties, occlusion summation, sub minimal fringe etc.
3. Tracts of spinal cord.
4. Descending tracts, pyramidal and extra pyramidal tracts.
5. Hemi section and complete section of spinal cord. Upper and lower motor neuron paralysis.
6. Cerebral Cortex, areas and functions – E.E.G.
7. Structure, connections and functions of cerebellum.
8. Basal ganglia and thalamus, connections and functions.
9. Reticular formation, tone, posture and equilibrium.
10. Autonomic Nervous System.

### **Special Senses:**

1. Broad features of eye, errors of refraction, lesions of visual pathways.
2. Speech and its disorders.
3. Ear and vestibular apparatus.

### **Practical & Demonstrations:**

- A.
1. Haemoglobinometer and total R.B.C. Count.
  2. Total W.B.C.Count.
  3. Preparation and staining of Blood smears, determination of differential W.B.C.Count.
  4. Blood Grouping.
  5. Erythrocyte Sedimentation rate.
  6. Bleeding and clotting time.
- B.
1. Artificial Respiration.
  2. Pulmonary function tests.
- C.
1. Heart Sounds.
  2. Arterial Blood pressure in man.
  3. Cardiac Efficiency tests.
  4. Recording and study of Electrocardiogram.
- D.
1. Testing of peripheral sensations and cranial nerves.
  2. Superficial and deep reflexes.
  3. Tests of Cerebral and Cerebellar functions.
- E. Varieties of stimuli, electrical apparatus for physiological experiment.

Frogs Nerve- muscle preparation and demonstration of the following experiments on it :

Simple muscle twitch .

Effect of load, temperature and fatigue on muscular contraction Frog's normal cardiogram.

Effect of following on normal cardiogram of Frog :

1. Temperature.
2. Extra systole.
3. Stimulation of vagosympathetic trunk.
4. Radial pulse tracing.
5. Basal metabolic rate.
6. Work physiology.

### **Human Physiology**

|                     |            |
|---------------------|------------|
| Theory              | 70 (3hrs.) |
| Internal Assessment | 30         |
| Practical           | 70         |
| Internal Assessment | 30         |

### **SUBJECT: HUMAN PHYSIOLOGY**

- |    |                            |             |           |
|----|----------------------------|-------------|-----------|
| 1. | Concise Medical Physiology | S.Chaudhary | Text      |
| 2. | Guyton's Physiology        |             | Reference |
| 3. | Ganong's Physiology        |             | Reference |

# **VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.**

## **BACHELOR OF PHYSIOTHERAPY**

### **First Year**

#### **PSYCHOLOGY**

1. Introduction to psychology – definition application – schools of psychology – methods of psychology – scope of psychology
2. Heredity and environment – sex determination – twins- mechanism – influences on the individual
3. Developmental Psychology – Definition – stages of life span- behavioral changes during development
4. Sensation, attention and perception- Basic senses – factors determining attention – principles of perception – errors in perception
5. Motivation – definition – motivational cycle- types of motives – theories of motivation – frustration and conflicts
6. Emotion and stress – definition- psychological and physiological changes during emotion – theories of emotion – management of stress ( in Brief)
7. Thinking – Definition – types- steps in creative thinking – concept formation
8. Intelligence – Definition – theories of intelligence – intelligence tests
9. Memory – theories of memory – forgetting process – methods to improve memory
10. Learning – Definition – theories of learning methods of learning
11. Personality – Definition – personality development – classification – theories of personality – personality assessment – defense mechanisms
12. Social psychology – Definition – nature and scope of social psychology – attitude and attitude change – leadership styles
13. Communication – types – effective ways of communication / teaching
14. Pain psychology – define pain – physiology of pain- psycho – social factors of pain – pain management (Psychological methods)
15. Abnormal psychology – definition – classify psychological disorders ( in brief) psycho somatic disorders – psycho therapy and counseling.

#### **SOCIOLOGY**

The subject will introduce the student to the basic sociological concepts, principles and social processes, social concepts, principles and social processes, social institutions in relation to the individual, family and community, and the individual, family and community, and the various social factors affecting the family in rural and urban communities.

#### **Introduction:**

1. Meaning - Definition and scope of sociology.
2. Its relation with anthropology, psychology,
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 professionals.

#### **Social factors in Health and disease:**

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

### **Socialization:**

1. Meaning and nature of socialization.
2. Primary, secondary and anticipatory socialization.
3. Agencies of Socialization.

### **Social Groups:**

1. Concepts of social groups , influence of formal and informal groups on health and sickness. The role of primary groups and secondary groups in the hospital and rehabilitation settings.

### **Family:**

1. The family.
2. Meaning and Definition.
3. Functions.
4. Types
5. Changing family patterns.
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.

### **Community:**

1. Rural community - Meaning and features - Health hazards of ruralites.
2. Urban community - Meaning and features - Health hazards of Urbanites.

### **Culture and Health:**

1. Concept of culture.
2. Culture and behavior.
3. Culture meaning of sickness.
4. Culture and Health Disorders.

### **Social Change:**

1. Meaning of social changes.
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 social planing in the improvement of health and in rehabilitation.

### **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.

### **Social security:**

Social security and social legislation in relation to disabled.

**Social Worker:**

Meaning of social work. The role of a medical social worker.

**3. Psychology & Sociology**

|            |                     |    |
|------------|---------------------|----|
| Psychology | Theory              | 35 |
|            | Internal Assessment | 15 |
| Sociology  | Theory              | 35 |
|            | Internal Assessment | 15 |

(Combined Psychology & Sociology 70 marks, duration 3 hrs.)

**SUBJECT: PSYCHOLOGY & SOCIOLOGY**

|    |                                 |                              |      |
|----|---------------------------------|------------------------------|------|
| 1. | Text book of Psychology         | Mann & Morgan                | Text |
| 2. | Psychology                      | Atkinson                     |      |
| 3. | Psychology for physiotherapists | Ramalingam A. T. & Bid D. N. | Text |
| 4. | Text book of Sociology          | Vidhya Bhushan               | Text |
| 5. | Sociology For Physiotherapists  | Bid Dibyendunarayan          | Text |

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**BACHELOR OF PHYSIOTHERAPY**  
**First Year**

**Fundamentals of Bio- Medical Physics**

**Physics and properties of Matter:**

Machines - Principle of work, Definition, Mechanical advantage,. Lever, pulley and three systems of pulley, wheel and axle. Fluid mechanics- viscosity, definition, co-efficient of viscosity, poise critical velocity, principle of Archimedes, law of floatation Hydrostatic pressure- surface tension, buoyancy, streamline flow and turbulent flow, effect of temperature and pressure on viscosity, surface tension, excess pressure in spherical liquid drop. Friction - Limiting friction, laws of static and dynamic friction, friction - necessity and evil, physical properties of water. Elasticity- only definition.

**Heat:**

Emissive and absorptive power-properties of thermal radiation, perfectly black body, kichoff's law, Newton's law of cooling and specific heat by cooling and specific heat by cooling, first law of thermodynamics and its application, second law of thermodynamics, Grothus law, joule's law of heat production.

**Sound:**

Newton's formula for velocity of sound, Medle's experiment, resonance and velocity of sound by resonance method, Ultrasonic- production and its application, recording and reproduction of sound.

**Light:**

Absorption and Emission spectra, classification of emission spectra sole spectrum and Fraunhoffer lines, infrared spectrum and ultra violet spectrum. Interference ,laser and its application.

**Electricity:**

Different types of capacitors, biological cell as capacitor, ohm's law, thermo electricity chemical effect of current and electromagnetic induction - faraday's law, Fleming right hand rule, self induction, mutual induction, induction coil, induced E.M.F. in the coil rotating in magnetic field, transformer long distance transmission, measurement of A.C./D.C., Modified current, milliammeter, voltmeter, Jack coil, variable rheostat.

**Modern physics:**

Structure of atom (Bohr model), infra red rays, ultra violet rays and lamp short wave diathermy, electric shock, radio active isotopes and medical applications of isotopes,

**Electronics:**

Semi conductor, diode as rectifier, amplifier, production of high frequency of current ( micro-wave) by klystron magnetron. Amplifier C.R.O. triode as amplifier, triode as oscillator,

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**BACHELOR OF PHYSIOTHERAPY**  
**First Year**

**Fundamentals of Bio-Medical Physics**

**Fundamentals of Bio-Medical Physics**

|                     |            |
|---------------------|------------|
| Theory              | 70 (3hrs.) |
| Internal Assessment | 30         |

**Subject** : Fundamental of Biomedical Physics.

1. College Physics ( 3<sup>rd</sup> Ed. ) Searl Levansky
2. Physics Part 1 & 2  
Robert Rasmik and David Halliday.

# **BACHELOR OF PHYSIOTHERAPY**

## **First Year**

### **EXERCISE THERAPY – I & SOFT TOSSUE MANIPULATIONS**

#### **SECTION-I**

1. Introduction to exercise therapy.
2. Physiological effects and uses of exercise.
3. Psychogenic aspects of exercises.
4. Pharmacological aspects of exercises.
5. Use of apparatus in exercise therapy.
6. Fundamental starting Positions derived position- effects and uses, pelvic tilt.
7. Muscle work for all positions.
8. Joint movement - terminology and range, axes and planes of movement, levers, measurement of joint movements, goniometry, types of goniometers- bubble and gravity goniometers.
9. Classification of movements.
10. Active movements- Definition, types, techniques, effects and uses.
11. Passive movement - Definition, types, techniques of relaxed passive movement and uses, comparison of both movements.
12. Causes of restriction of range of movement - Distinguish between skin, muscle, and capsular contractures.
13. Group work - Criteria of selection of patients, advantages and disadvantages of group class exercises.
14. Home exercise - trick movements.
15. Suspension therapy - definitions of suspension and point of suspension, type of suspension, pulleys and use of pulley in suspension therapy, application of suspension therapy either to increase the joint range or to increase muscle power.
16. Breathing - Mechanism of breathing (normal), muscles of respiration, changes in thoracic cage during process of respiration, types of breathing exercise, training programme- diaphragmatic and segmental breathing.
17. Pursed lip breathing - significance.
18. Crutch walking - Types of crutch walking, use of parallel bars in pre - crutch walking stage, balance exercises, phases of walking, gait training, group of muscles responsible during crutch walking.
19. Progression in crutch walking, measurement of crutches, other walking aids- canes, crutch-walking on even surface, slope, climbing up the stair-case.

#### **SECTION-II**

20. Measurement of limb length, methods of measurements.
21. Application of resistance to develop endurance and power, progression of exercises, angle of pull, types of muscle work, exercises-free, resisted, assisted- use of gadget apparatus.
22. Resisted Exercises: Techniques and types of resistance, SET system (Heavy resisted exercises) Oxford Method, Delorme Method, McQueen's Method).
23. Free Exercises - Classification, technique, and effects of free exercises- application for shoulder, neck, hip and knee joints, techniques of mobilization for stiff joints.
24. Mat exercises re-education of balance, strength, and endurance.
25. Posture - definition, types, factors influencing posture, postural training.
26. Maintenance of record - volume, range of motion, resistance, limb length.

### **SOFT TISSUE MANIPULATION**

27. Introduction- brief history, definition, classification. Physiological effects and therapeutic uses, contraindications.
28. Preparation of patient, basic points to be considered before and during massage procedure.
29. Technique, effects and uses of each manipulation.
30. Massage for arm, leg, neck, and upper back & face.
31. Massage for edema, scar, tendinitis, fibrosis (tight fascias)
32. Mobilization of soft tissues, joints and fluid collection.

### **5. Exercise Therapy-I & Soft tissue Manipulations**

|                     |            |
|---------------------|------------|
| Theory              | 70 (3hrs.) |
| Internal Assessment | 30         |
| Practical           | 70         |
| Internal Assessment | 30         |

#### **SUBJECT: EXERCISE THERAPY-I AND SOFT TISSUE MANIPULATION**

|    |                              |                 |           |
|----|------------------------------|-----------------|-----------|
| 1. | Exercise therapy             | Dena Gardiner   | Text      |
| 2. | Practical Exercise therapy   | Margaret Hollis | Text      |
| 3. | Tidy's Physiotherapy         | Porter          | Reference |
| 4. | Aids to Physiotherapy        | Lee             | Reference |
| 5. | Massage Manipulation         | Margaret Hollis | Text      |
| 6. | Bird's Massage               |                 | Reference |
| 7. | Measurement to joint motion. | Norkins & White | Text      |

Guide to Goniometry

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**BACHELOR OF PHYSIOTHERAPY**  
**First Year**  
**English**

(I) "Current Prose for Better Learning" : Edited by Vimala Rama Raw Macmillan India Limited (1982 ) All lessons ( Except lesson No. 12 ) of above text should be exclusively taught as an intensive course during the first term.

(II) " Living English Grammar and Composition "M.L.Tickoo, A.E.Subramanian, P.R.Subramanian, Orient Longman (1998)

Following parts of the above text should be taught in the second term:

Articles: (Ch-2) Primary Auxiliaries and Model Auxiliaries ( Ch-6) The tenses form and use (Ch-10) Negative and interrogative Sentences (Ch-11), The passive Voice (Ch-12): Direct and indirect speech ( Ch-14)

Composition: Letter Writing & Essay Writing.

**Note:** Distribution of marks for the University Examination will be as under:

|    |  |               |
|----|--|---------------|
| 1. | Short Answer type Questions                                    | 6 Marks.      |
| 2. | General Questions  | 7 "           |
| 3. | Short notes  | 5 "           |
| 4. | Comprehension & Précis   | 3 "           |
| 5. | Letter Writing: Formal Letter of request complaints, inquiries | 5 "           |
| 6. | Essay  | 4 "           |
| 7. | Grammar  | 5 "           |
|    |  | -----         |
|    |  | 35            |
| 6. | English  |               |
|    | Theory   | 35 (2 Hours.) |
|    | Internal Assessment  | 15            |

**SUBJECT: ENGLISH**

| No. | Name of books                          | Name of author                 | Type |
|-----|--|--------------------------------|------|
| 1.  | Current Prose for better learning      | Vimala Rama Rao                | Text |
| 2.  | Living English Grammar And Composition | M.L.Tickoo,<br>A.E.Subramaniam | Text |