VEER NARMAD SOUTH GUJARAT UNIVERSITY

BACHELOR OF PHYSIOTHERAPY (B. Physiotherapy)

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

Second year

(1) Pathology & Microbiology

(2) Pharmacology & Biochemistry

(3) Exercise Therapy II & Exercise Physiology

(4) Electro Therapy I

(5) Electro Therapy II

(6) BioMechanics & Kinesiology

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BACHELOR OF PHYSIOTHERAPY

Second Year

2005-2006

Structure of question paper for Electrotherapy I, Electro therapy II, Pharmacology (section 1) & Biochemistry (section 2), Pathology (section 1) & Microbiology (section 2)., Biomechanics & Kinesiology, Exercise therapy -II & Exercise Physiology.

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

		TOTAL: 35

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

		TOTAL: 35

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BACHELOR OF PHYSIOTHERAPY

Second Year

PATHOLOGY

1. Introduction: Aims and objects of study of pathology .Definitions of health, disease, causes of disease, methods of study of disease.

2. Reversible and Irreversible Cell Injury: Cellular adaptation - hypertrophy, hyperplasia, and atrophy.

3. Acute Inflammation: General morphology, phenomenon of acute inflammation.

4. Repair of wound, fractures, skin, nerves, and muscles.

5. Chronic inflammation: Osteomyelitis, tuberculosis (lung, bone), leprosy, and syphilis.

6. Fluid and hemodynamic disturbances: edema, thrombosis embolism infarction.

7. Neoplasia: General outline, classification, characteristics of benign and malignant tumors, and spread of tumors, systemic effects.

8. Disorders of joints: Rheumatoid arthritis, osteoarthritis, hemarthrosis, gout.

9. Immunity and hypersensitivity.

10. Hematological disorders: Anemias, hemophilia.

11. Respiratory disorders: Suppurative lung diseases, bronchial asthma, and emphysema.

12. Diseases of nervous system: Poliomyelitis, cerebrovascular accidents, and hydrocephalous

13. Diseases of muscles: Myasthenia gravis, myopathies, amyotonia congenita, the genetically determined neuromuscular diseases.

14. Diseases of C.V.S.: A brief outline of heart diseases, infective endocarditis, ischemic heart disease,
    Diseases of blood vessels - Buerger's disease, T.A.O., Thrombophlebitis, atherosclerosis.

MICROBIOLOGY

General Bacteriology:

1. Introduction, historical Background, classification of micro-organisms.
2. Morphology of bacteria.
3. Staining of bacteria.
4. Sterilization.
5. Culture media.

Systemic Bacteriology:

1. Gram positive cocci-strepto cocci, staphylococci.
2. Gram negative cocci – geno and meningococci.
3. Gram positive bacilli.
4. Gram negative bacilli- typhoid, cholera, dysentery.
5. Aerobic – diphtheria, tuberculosis, leprosy.
6. Anaerobic – tetanus, gas gangrene, botulism.

Immunology:

1. Immunity, antigens. antibodies
2. Antigen - antibody reactions.
3. Agglutination, precipitation.
4. Hypersensitivity reactions.

General virology:

1. Poliomyelitis
2. Rabies.
3. Demonstration of tests in:

    Diagnosis of AIDS.
    Diagnosis of hepatitis.
    Diagnosis of syphilis.

Parasitology:

1. Malaria.
2. Amoebiasis.
3. Round worm and Hookworm.

Mycology:

1. Candidiasis, Ringworm, scabies.

SUBJECT: PATHOLOGY & MICROBIOLOGY

No.	Name of books	Name of author	Type
1.	Text book of Pathology	Harsh Mohan	Text
2.	Text book of Pathology	S.K.Biswas	Text
3.	Basics of Pathology	Robbins and Kumar	Text
4.	Clinical Pathology & Clinical Bacteriology	K.N.Sachdev	Reference
5.	Medical Parasitology	Rajesh Bhatia	Reference
6.	Modern Immunology	A.Dasgupta	Reference
1.	Medical Microbiology	Cruik Shank	Text
2.	Essentials of Microbiology	Jochu Panicker & Rajesh Bhatia	Reference

Pathology & Microbiology

Pathology	Theory	35	
	Internal Assessment		15
Microbiology	Theory		35
	Internal Assessment		15

(Combined paper Pathology & Microbiology 70 marks, 3 hrs. duration)

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Second Year

PHARMACOLOGY

1. Chemical character and general action of drugs.
2. Methods of administration.
3. Metabolic fate of drug.
4. Drug toxicity including allergy and idiosyncrasy.
5. Drugs acting on C.N.S., anesthetics, antipyretics; hypnotics,
6. Drugs acting on peripheral nervous system, stimulating and / or inhibiting cholinergic and adrenergic activity.
7. Drugs acting on neuromuscular junction and muscle.
8. Drugs acting on the cardio-vascular system.
9. Chemotherapeutic agents.
10. Drugs acting on the respiratory system.
11. Hormones and drugs affecting endocrine functions.
12. The Vitamins.
13. Immunological agents.
14. Irritants, counterirritants, plasters, paste.
15. Diagnostics.

BIOCHEMISTRY

1. Biochemical characteristics of living matter.
2. Biochemistry morphology of cell.
3. Nucleic acids.
4. Proteins.
5. The enzymes.
6. Metabolism.
7. Hormones.
8. Nutrition.
9. Biochemistry of connective tissues, nerve tissue and muscle.
10. Water, electrolyte and base balance.
11. Chemistry of biology materials.
12. Physical chemistry phenomenon.
13. Common procedures done in biochemistry.

SUBJECT: PHARMACOLOGY & BIO CHEMISTRY

1.	Essential of Medical Pharmacology K.D. Tripathi	Text
2.	Text book of Medical Bio-Chemistry Chatterjee and Shinde	Text

Pharmacology & Biochemistry

Pharmacology Theory	35
Internal Assessment	15
Biochemistry Theory	35
Internal Assessment	15

(Combined paper Pharmacology & Biochemistry 70 marks, 3 hrs. duration)

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BACHELOR OF PHYSIOTHERAPY

Second Year

EXERCISE THERAPY – II

SECTION-I

1. **Passive Movements:** Definition, types, technique, effects and uses, CPM unit, comparison of passive movements with active movements, practice of passive movements for all joints of extremities, neck and trunk.

Stretching: Definitions related to stretching, types of contra cures and differentiation, properties of soft tissues affecting elongation, mechanical characteristics of non contractile soft tissues, stress-strain curve, therapeutic methods of stretching - manual and mechanical stretching, cyclic mechanical stretching, indication and aims of stretching, principles of stretching and contra-indications.

Traction**:** Types, effects, principles of application for cervical and lumbar spine, traction to soft tissues of joints- gliding movements.

2. **Mobilization:** Causes of restriction of range of movements, prevention of restrictions, techniques of mobilization of various joints of limbs, assistance to mobilize joints. ROM through functional diagonal, patterns. Joint mobilization manipulations definition, types, joint shapes, types of motion arc stretching, glide stretching, compression, traction, indications, contra-indications and precautions, conditions for special precautions.

3. **Manual muscle testing:** Need of MMT, Fundamental principles, anatomical and physiological bases of muscle testing, oxford scale of muscle gradation, principles of isolation, substitution, stabilization, grading procedure for muscles of arm, leg, neck and truck.

4. **Breathing exercise and Postural drainage**: Breathing mechanisms and postural drainage, normal mechanism of respiratory diseases, control of breathing, pursed lip breathing, postural drainage assistive measures, techniques, indications, and contra-indications.

5. **Posture:** Types, factors influencing posture, regulation of postural reflex mechanism, pelvic tilt, and postural deviations of spine and treatment.

6. **Strengthening of muscles:** Principles involved to prevent muscle wasting, Rood's techniques, initiating of muscle contraction, progressive strengthening of muscles, (Load assisted and load resisted exercise) use of equipments, re-education of muscles and restoration of limbs, neck, truck and face. Emphasis on hand and foot muscles, quadriceps, glutei, calf, triceps, deltoid and face muscles. Use of manual and mechanical resistance, contra-indications to resisted exercises. Isometric- isokinetic regime.

7. **Proprioceptive Neuromuscular facilitation:** Introduction, response of neuromuscular mechanism, basic techniques of PNF Patterns of arm, leg, head, neck and trunk (Emphasis on straight patterns). Specific techniques of emphasis. Repeated contraction-slow reversal, contract - relax, hold-relax, rhythmic stabilization. Inhibitory techniques. Kabat-Bobath- Rood's.

8. **Hydrotherapy:** Physiological properties of water and hydrodynamics, physiological and therapeutic effects of exercises in warm water, progression of hydro-exercise, theory and application of Badragaz technique, Indications and contra-indications of hydrotherapy.

9. **Relaxation:** Muscle tone, postural tone, general and local relaxation, techniques of relaxation.

10. **Neuromuscular coordination & in coordination**, factors governing coordination, principle of re-education of coordination, Frenkel's exercises and its techniques.

11. **Functional re-education**, mat activities for re-education of hemiplegics, paraplegics and cerebral palsy. Walking re-education in neurological conditions and in orthopedic cases.

12. **Aerobic exercises**: Physiological effects and therapeutic uses of aerobic exercises, fitness testing, stress testing for healthy and convalescent individuals.

13. **Exercise programme** to test-strength, flexibility, endurance, and skill.

SECTION-II

EXERCISE PHYSIOLOGY

1. Nutrition – Carbohydrates, proteins, fats, vitamins, minerals, water; Optimal nutrition for exercise.
2. Strength, power, endurance, speed, flexibility, agility, skill, aerobic and anaerobic activity.
3. Energy for physical activity, energy value of food, energy transfer in the body, energy release for food.
4. Energy transfer in exercise
   Human energy expenditure during rest & physical activities (including walking, jogging, running, swimming)
5. Measurement of energy expenditure
   Metabolic consideration – VO2, Lactate threshold, RQ, energy expenditure in terms of Calorimetry
6. Acute effects of exercise on – Cardiovascular, Respiratory, Metabolic (aerobic & anaerobic), Thermo-regulatory, Buffer (pH), Neuro-musculoskeletal, Endocrine, Immune systems.
7. Fatigue – causes and management;
8. Conditioning effects (adaptations) of exercise on – Cardiovascular, Respiratory, Metabolic (aerobic & anaerobic(, Thermo0regulatory, Buffer (pH), Neuro-Musculo-skeletal (strength, power, endurance, speed, flexibility, agility, skill), Endocrine, Immune systems, Body composition
9. Measurement of aerobic & anaerobic power and other adaptations (Exercise tolerance test-types-walk test, step test, bicycle ergometry, treadmill test etc; basic parameters; pre-/post-/during-exercise studies)
10. Training – aerobic & anaerobic (strength, power, endurance, speed, flexibility, agility, skill)
11. Exercise at medium & high altitude; Sport diving; Space/micro gravity
12. Effects of prolonged Bed rest/Immobilization
13. Exercise prescription for special groups – children, adolescent, female, elderly

SUBJECT: EXERCISE THERAPY II AND EXERCISE PHYSIOLOGY

1.	Therapeutic Exercise	Kisner and Colby	Text
2.	Goniometry Practice	Norkin and white	Text
3.	Manual of muscle testing	Daniel	Text
4.	Manual of muscle testing	Kendall	Text
5.	Exercise Physiology	MacArdle	Text

Exercise-Therapy II & Exercise Physiology

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

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BACHELOR OF PHYSIOTHERAPY
Second Year

ELECTRO THERAPY – I

SECTION - I

Electromagnetic Waves:
Electromagnetic spectrum, physical properties of electromagnetic radiations of reflection, refraction, absorption, penetration, grothus law, inverse square law and its practical application.

Infra Red Rays:
Production of infra red rays, luminous and non luminous generators, penetration, technique of application, physiological effects and therapeutic uses of infra red rays, duration and frequency of treatment, indications and contraindications, dangers and precautions.

Ultra Violet Rays:
Production of U.V.R., mercury vapor lamps (Kromayer lamp). Fluorescent tubes for U.V.R. production (Alpinesun lamp), Theraktin tunnel and PUVA apparatus.
Physiological effects of U.V.R. (Chemical reactions with skin).
Structure of skin, penetration and absorption of U.V.R. Erythema, different degrees of erythema, test dose, technique to find out the test dose and its importance.
Technique of application of U.V.R. in local and general irradiation, specific conditions like psoriasis, acne, alopecia, and indolent wounds.
Technique of applications using accessories.
Filters, sensitizors.
Dangers and contraindications.

Cold Therapy:
Physiological effects and therapeutic uses of ice therapy, techniques of application, contra-indications to ice treatment.

Hydrotherapy:
Properties of Water. Buoyancy, effects of buoyancy on movement, Hubbard tank, contrast bath.

Paraffin Wax Bath: Structure of the bath, composition of wax and mineral oils, physiological effects and therapeutic uses of wax bath.

Other Heating Modalities: Heating pad, Moist Heat.

High Frequency Current:

Short wave Diathermy: Introduction, Physiological effects and Therapeutic effects of SWD, Methods of application (capacitor field method and cable method etc.), Techniques of application, indications, contra-indications and dangers.

Pulsed SWD: Definition, characteristics, mechanism of work, physiological effects & Therapeutic effects, Indications, Technique of application, principles of treatment and contra-indications.

SECTION - II

Microwave Diathermy: Introduction and characteristics, physiological effects, Therapeutic effects, Techniques of application and principles of treatment, Dangers & contraindications of microwave diathermy.

LASERS: Introduction and characteristics, effects on tissue, Therapeutic effects, principles of application, indications, contraindications and dangers.

Ultrasonic Therapy: Introduction and characteristics, U.S.therapy parameters, Coupling media, Therapeutic effects, Indications, contra-indications and dangers, Testing of apparatus, Techniques of application & dosage.

SUBJECT: ELECTROTHERAPY I & II

1.	Electro therapy explained	Low and Reed	Text
2.	Electro therapy practice	Joseph Khan	Text
3.	Claytons Electrotherapy	Clayton	Text
4.	Treatment with interferential current	Nikolova	Reference
5.	Practice of Laser therapy in PT	Dexter	Reference
6.	Clinical Electro therapy	Nelson	Reference

Electrotherapy-I

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

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BACHELOR OF PHYSIOTHERAPY
Second Year
ELECTRO THERAPY – II

SECTION- I

Low Frequency currents:

Nerve muscle physiology: resting potential, action potential, motor unit, synapse and synaptic transmission of impulse. Effect of negative and positive electrodes on nerve & accommodation.

Faradic Current: Definition, characteristic and modified faradic current, sinusoidal current, Parameters of faradic stimulation, physiological and therapeutic effects of faradic-stimulation, Indications, contraindications and precautions, Techniques of stimulation, Group muscle stimulation, faradic foot bath, faradism under pressure and pelvic floor muscle re-education.

Galvanic Current: Introduction & Characteristics, Parameters of stimulation, Physiological and therapeutic effects of stimulation, Indications and Contraindications, Principles of treatment and techniques of stimulation, precautions, Electro diagnistic proaduers .

Iontophoresis: Definition, principles of iontophoresis, physiological and therapeutic effects, indications, techniques of iontophoresis, principles of treatment, contra-indications and dangers.

TENS: Definition, pain gate theory, Theories of pain modulation, principle of TENS treatment, Techniques of treatment, indications and contraindications.

SECTION - II

Medium Frequency Current:

Interferential Current: Definition, characteristics, physiological & therapeutic effects of I.F. current, Indications, Techniques of application, Contraindications and Precautions.

Bio-Feed Back:

Introduction, principles of Bio-feed back, Therapeutic effects of bio-feed back, Indications and contraindications, Techniques of treatment.

Advanced Electrotherapy:

Computerization in electrotherapy, programming of parameters of treatment appropriate selections of parameters and combination in therapy combined therapy – Principles, therapeutic uses and indications like, U.S. therapy with simulation or TENS etc.

SUBJECT: ELECTROTHERAPY I & II

1.	Electro therapy explained	Low and Reed	Text
2.	Electro therapy practice	Joseph Khan	Text
3.	Claytons Electrotherapy	Clayton	Text
4.	Treatment with interferential current	Nikolova	Reference
5.	Practice of Laser therapy in PT	Dexter	Reference
6.	Clinical Electro therapy	Nelson	Reference

Electrotherapy-II

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

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BACHELOR OF PHYSIOTHERAPY
Second Year
BIO-MECHANICS AND KINESIOLOGY

SECTION-A

Unit -I Basic concept in Biomechanics

Unit -II Joint structure & function

Unit -III Muscle structure and function

Unit -IV The vertebral column

Unit -V The thorax and chest wall

Unit -VI The temporo-mandibular joint

Unit -VII The shoulder complex

Unit -VIII The elbow complex

Unit -IX The wrist and hand complex

SECTION- B

Unit-X The hip complex

Unit -XI The knee complex

Unit -XII The ankle and foot complex

Unit -XIII Posture

Unit- XIV Gait

SUBJECT: BIOMECHANICS & KINESIOLOGY

1.	Joint structure and function	C.Norkin	Text
2.	Clinical Kinesiology	Wells and Lutgens	Text
3.	Clinical Kinesiology	Smith and Weiss	Text
4.	Brunnstorms Clinical Kinesiology	Smith and Weiss	Text

Biomechanics & Kinesiology

Theory	70 (3 hrs.)
Internal Assessment	30

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Second Year

SUBJECT TRANSCRIPT

SR. NO.	SUBJECT	TOTAL HOURS OF TEACHING
1.	Human Anatomy	250
2.	HUMAN PHYSIOLOGY (Inclusive of electro-physiology)	200
3.	Psychology & Sociology	80
4.	Bio-medical physics	100
5.	Exercise – therapy I&II & soft tissue Manipulations	300
6.	Electro therapy -I&II	300
7.	Pathology	50
8.	Microbiology	30
9.	Biochemistry	50
10.	Pharmacology	30
11.	Bio-Mechanics & Kinesiology	100
12.	Psychiatry	30
13.	Neurology	50
14.	General Medicine	35
15.	Pediatrics	20
16.	Skin & V.D	20
17.	Cardio-Pulmonary Surgery	35
18.	Obstetrics & Gynecology	30
19.	Orthopedics	80
20.	General Surgery+ Plastic Surgery	35
21.	ENT	10
22.	Ophthalmology	10
23.	Radiology	10
24.	Physiotherapy in conditions	1047
25.	Bio-Statistic & Research Methodology	70
26.	Rehabilitation Therapy (P&O splinting)	35
27.	Ethics, Administration & Management	30
28.	Institutional Visits, Conferences, Educational Tours & others	150
29.	Clinical hours during S.Y., T.Y., & final year	1400
30.	Clinical hours during Internship	1300
31.	Computers	100
32.	English	80
33.	Exercise Physiology	80
	TOTAL	**6147**