

# **Khalsa College Amritsar**

**-An Autonomous College**

**Affiliated to Guru Nanak Dev University, Amritsar.**

**Session 2019-2020**  
**Syllabus: Physiotherapy**



**Post-Graduate Department of Physiotherapy**

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## Scheme of Examination

### MPT (Cardiopulmonary)

Course Code: MPC

#### Semester I

S. No.	Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total Marks
			Th	Pr			
1	MPT-01	Research Methodology & Biostatistics	25	--	75	--	100
2	MPC-01	Basic Medical Sciences	25	25	75	75	200
3	MPC-02	Physical and Functional Evaluation in Cardiopulmonary Disorders	25	25	75	75	200
4	MPC-03	Clinicals/Journal Club - I	--	25	--	75	100

#### Semester II

S. No.	Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total Marks
			Th	Pr			
1	MPT-02	Skill Enhancing Studies	25	--	75	--	100
2	MPT-03	Exercise Physiology and Nutrition	25	25	75	75	200
3	MPC-04	Medical and Surgical Aspects of Cardiopulmonary Conditions	25	25	75	75	200
4	MPC-05	Clinicals/Journal Club - II	--	25	--	75	100

**Semester III**

S. No.	Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total Marks
			Th	Pr			
1	MPC-07	Cardiopulmonary Physiotherapy	25	25	75	75	200
2	MPC-08	Preventive Cardiology	25	25	75	75	200
3	MPC-09	Dissertation – I	--	25	--	75	100
4	MPC-10	Practical	--	25	--	75	100
5	MPC-11	Clinicals/Journal Club – III	--	25	--	75	100

**Semester IV**

S. No.	Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total
			Th	Pr			
1	MPC-12	Cardiac and Pulmonary Rehabilitation	25	25	75	75	200
2	MPC-13	Modalities and Interventions in ICU	25	25	75	75	200
3	MPC-14	Dissertation – II	--	50	--	150	200
4	MPC-15	Practical	--	50	--	150	200
5	MPC-16	Clinicals/Journal Club - IV	--	25	--	75	100

## MPT (Orthopedics)

Course Code: MPO

### Semester I

S. No.	Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total Marks
			Th	Pr			
1	MPT-01	Research Methodology & Biostatistics	25	--	75	--	100
2	MPO-01	Basic Medical Sciences	25	25	75	75	200
3	MPO-02	Physical and Functional Evaluation in Musculoskeletal Disorders	25	25	75	75	200
4	MPO-03	Clinicals/Journal Club - I	--	25	--	75	100

### Semester II

S. No.	Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total Marks
			Th	Pr			
1	MPT-02	Skill Enhancing Studies	25	--	75	--	100
2	MPT-03	Exercise Physiology and Nutrition	25	25	75	75	200
3	MPO-04	Medical and surgical aspects of Orthopedic conditions	25	25	75	75	200
4	MPO-05	Clinicals/Journal Club – II	--	25	--	75	100

**Semester III**

S. No.	Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total Marks
			Th	Pr			
1	MPO-07	Physiotherapy management in Orthopedic conditions	25	25	75	75	200
2	MPO-08	General Orthopaedic Physiotherapy	25	25	75	75	200
3	MPO-09	Dissertation – I	--	25	--	75	100
4	MPO-10	Practical	--	25	--	75	100
5	MPO-11	Clinicals/Journal Club–III	--	25	--	75	100

**Semester IV**

S. No.	Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total
			Th	Pr			
1	MPO-12	Bioengineering and rehabilitation principles	25	25	75	75	200
2	MPO-13	Approaches in Musculoskeletal physiotherapy	25	25	75	75	200
3	MPO-14	Dissertation – II	--	50	--	150	200
4	MPO-15	Practical	--	50	--	150	200
5	MPO-16	Clinicals/Journal Club - IV	--	25	--	75	100

**MPT (Neurology)****Course Code: MPN****Semester I**

S. No.	Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total Marks
			Th	Pr			
1	MPT-01	Research Methodology	25	--	75	--	100
2	MPN-01	Basic Medical Sciences	25	25	75	75	200
3	MPN-02	Physical and Functional Evaluation of Neurological Disorders	25	25	75	75	200
4	MPN-03	Clinical/Journal Club - I	--	25	--	75	100

**Semester II**

S. No.	Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total Marks
			Th	Pr			
1	MPT-02	Skill Enhancing Studies	25	--	75	--	100
2	MPT-03	Exercise Physiology and Nutrition	25	25	75	75	200
3	MPN-04	Medical and Surgical aspects of Neurological Conditions	25	25	75	75	200
4	MPN-05	Clinical/Journal Club – II	--	25	--	75	100



**Semester III**

S. No.	Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total Marks
			Th	Pr			
1	MPN-06	Basic Physiotherapeutics for Neurological Disorders	25	25	75	75	200
2	MPN-07	Neurosurgical Rehabilitation	25	25	75	75	200
3	MPN-08	Dissertation – I	--	25	--	75	100
4	MPN-09	Practical	--	25	--	75	100
5	MPN-10	Clinical/Journal Club – III	--	25	--	75	100

**Semester IV**

S. No.	Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total
			Th	Pr			
1	MPN-11	Neurological Rehabilitation	25	25	75	75	200
2	MPN-12	Physiotherapy in Pediatric Neurology	25	25	75	75	200
3	MPN-13	Dissertation – II	--	50	--	150	200
4	MPN-14	Practical	--	50	--	150	200
5	MPN-15	Clinical/Journal Club - IV	--	25	--	75	100

## BACHELOR OF PHYSIOTHERAPY

### First Year

Subject	Marks		Internal Assessment		Total Marks	Teaching Hours	
	Theory	Practical	Theory	Practical		Theory	Practical
Anatomy	75	75	25	25	200	225	100
Physiology	75	75	25	25	200	225	100
Biochemistry	75	--	25	--	100	100	--
Electrotherapy-I	75	75	25	25	200	125	200
Exercise Therapy-I	75	75	25	25	200	125	200
Punjabi/Basic Punjabi (Mudhli Punjabi)	75	--	25	--	100		--
Problem of Drug Abuse: Management and Prevention	100	--	--	--	100		--

### Second Year

Subject	Marks		Internal Assessment		Total Marks	Teaching Hours	
	Theory	Practical	Theory	Practical		Theory	Practical
Pathology & Microbiology	75	--	25	--	100	200	--
Pharmacology	75	--	25	--	100	100	--
Electrotherapy-II	75	75	25	25	200	100	200
Exercise Therapy-II	75	75	25	25	200	100	200
Biomechanics	75	--	25	--	100	100	--
Psychology	75	--	25	--	100	150	--
Sociology & Community Health	75	--	25	--	100	100	--
Environmental Study	75	--	25	--	100		--

### Third Year

Subject	Marks		Internal Assessment		Total Marks	Teaching Hours	
	Theory	Practical	Theory	Practical		Theory	Practical
Orthopaedics	80	80	20	20	200	150	50
General Medicine	80	80	20	20	200	100	50
PT in Ortho Conditions	80	80	20	20	200	100	100
PT in Medical Conditions- I	80	80	20	20	200	100	100
Research Methodology & Biostatistics	80	--	20	--	100	100	--
Neurology	80	80	20	20	200	100	100
Clinicals	--	80	--	20	100	--	400

### Fourth Year

Subject	Marks		Internal Assessment		Total Marks	Teaching Hours	
	Theory	Practical	Theory	Practical		Theory	Practical
General Surgery	80	80	20	20	200	100	50
Community Physiotherapy & Rehabilitation	80	80	20	20	200	100	100
Pediatrics & Geriatrics	80	80	20	20	200	100	50
PT in Medical Conditions-II	80	80	20	20	200	100	100
PT in Surgical Conditions	80	80	20	20	200	100	100
Rehabilitation, Organization and Administration	80	--	20	--	100	150	--
Computer Applications	--	40	--	10	50	--	50
Clinicals	--	80	--	20	100	--	400

**MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY, ORTHOPEDICS &  
NEUROLOGY) SEMESTER I**

**Research Methodology & Biostatistics**

**Paper: MPT-01**

**Time: 3 hrs**

**Max Marks: 100**

**Theory: 75**

**Internal Assessment: 25**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

**Description:**

**Research in physiotherapy:** Introduction, Need for Research in Physical Therapy, Research Definition, Concepts, Purpose and Significance, Types of Research, Ethical issues in Research.

**Research Design:** Meaning, Need, Features and Various concepts relating to research design, Types of research design, research Approaches: Quantitative and Qualitative- assumptions and problems, Experimental design: Basic principles of experimental research designs, single system and group or Multiple factor design- Problems, Characteristics and limitations, Non Experimental design: Survey research-Scope, types & Implementation. Clinical case reports, Qualitative Research designs & methods

**Research Process:** Research problems, Questions and Hypothesis, Various steps involved in Research process, criteria of good research and problems encountered by researchers.

**Measurement of Scaling techniques:** Measurement in Research- Definition, Various Scales, Errors in Measurement and Scaling Technique, Reliability and validity in research.

**Methods of Data Collection:** Types of Data sources- Primary and secondary. Collection of Primary data (Observation and Oral Interview method, Questionnaire, Schedules); Collection of secondary data (published and unpublished sources)

**Statistical Reasoning, Processing & Analysis:** Introduction to Data set, Frequency Distribution, Central tendency, Variability in Distribution, Measures of Asymmetry (Skewness), Measures of Relationship, Correlation-Simple, Partial and Multiple. Regression - Simple and Multiple.

**Sampling Fundamentals:** Basic concepts, Need of sampling, Sample design- Steps in Sample Design, Characteristics of Good Sample Design, Types of Sampling.

**Sampling Theory:** Principles of Sampling, Sampling and Non Sampling Errors, Theory of Estimation, Sampling Distributions, Central limit theorem, Sample size & its determination.

**Measures of Central Tendency and Dispersion-** Arithmetic mean, median, mode and standard deviation (application).

**Correlation and Regression:** Karl Pearson's correlation method, Rank correlation method, Regression Equation and their coefficients (numerical)

**Hypothesis Testing:** Null Hypothesis, Alternative Hypothesis, Acceptance and Rejection Region, Level of Significance, Type I & II errors, Hypothesis Testing for Means, Sample Proportions and Variances, Chi-Square Test for comparing variances, Conditions and steps involved in applying Chi-Square Test, Analysis of Variance (ANOVA)- Basic Principles Techniques, Coding Method, Two way ANOVA and Analysis of Covariance (ANCOVA); Importance and characteristics of Non Parametric or Distribution- Free Tests.

**Parametric and Non-Parametric Tests (Simple Applications):** Z-test, t-test, F-test, chi-square test, ANOVA (One way and two way), ANCOVA, Spearman's rank Correlation and Kendall's Coefficient of Concordance.

**Multivariate Analysis Techniques:** Characteristics, Classifications and Variables in Multivariate Analysis, Techniques of Factor Analysis.

**Writing an Research Proposal, Critiquing a Research Article:** Defining a problem, Locating the Literature, Types of Literature, Evaluating Literature- Evaluating Single Studies and Review Articles, Elements of Research article- Inclusion and Exclusion Criteria, Funding, Data Collection & Analysis, Results, Interpretation, Conclusion, Discussions.

**Interpretation and Report writing:** Meaning, Techniques, Precautions, Significance, Steps and Types

**Publication and Presentation of Research**

### **BOOKS RECOMMENDED:**

1. Cooper D.R and Schindler, P.S., Business Research Method, Tata McGraw Hill Publishing Co.
2. Carolyn. M. Hicks, Research for Physiotherapists, Project Design and Analysis, Elsevier Health Sciences, Second Edition.
3. C.R Kothari. Research Methodology-Methods and Techniques, New Age International Limited, Publishers, Second Edition.

# MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER I

## Basic Medical Sciences

**Paper: MPC-01**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25; Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

### **Description:**

#### **Unit I**

#### **APPLIED ANATOMY AND BIOMECHANICS**

- Review of anatomy of cardiovascular system, surface marking of heart and great vessels.
- Review of anatomy of lungs, surface marking of lungs and pleura.
- Respiratory Mechanics: Chest wall mechanics- Movement of ribs, mode of action of intercostals muscle and diaphragm.
- Antagonistic and synergistic action of diaphragm and abdominals, thoracic movement during inspiration and expiration.

#### **Unit II**

#### **APPLIED PHYSIOLOGY**

- Physics of diffusion and gas physics.
- Gas laws- Boyles' law, Charles law, Dalton's law of partial pressure, Diffusion of gases through respiratory membrane, Ficks law, Henrys law of solubility, Graham's law of diffusion and diffusion capacity.
- Ventilation perfusion relationship –concept of physiological shunt and physiological dead space.

- Physics of ventilation: Pressures changes during ventilation and pressure flow relationship of pulmonary airways, principle of elastance - law of laplace, surface tension and role of surfactant.
- Principle of airway resistance and lung impedance- types of flow-laminar and turbulent flow, work of breathing and ventilatory reserve, static and dynamic lung mechanics.
- Pressure flow relationship, vascular distensibility and compliance, delayed compliance or stress relaxation of vessel.
- Cough reflex.
- Properties of cardiac muscles – electrical properties like excitability, autorhythmicity and conductivity, mechanism and control of cardiac contractile process, length-tension relationship and force-velocity relationship, myocardial contractility and lusitropy.
- Cardiac cycle: Determinants of ejection and filling, starling curves and pressure volume loop, interplay between venous return and cardiac output, neurohumoral response of heart and hemodynamic defense reactions.
- Arterial blood pressure.
- Lymphatic circulation.

### **Unit III**

- Age related changes in cardiovascular and pulmonary system.
- Body positioning and various systemic changes.
- Difference between adult and pediatric lung.
- Hill equation, Internal and external work of heart, minute work, energy cost of work of heart, cardiac efficiency.

### **Unit IV**

#### **PHARMACOLOGY**

- Cardiovascular drugs
  - a. Anti arrhythmic
  - b. Anti hypertensive
  - c. Drugs used in cardiac failure
- Drugs used in respiratory diseases

**BOOKS RECOMMENDED:**

1. Arthur Clifton Guyton, John Edward Hall, Textbook of Medical Physiology, Saunders, 2000.
2. Shapiro B, M.D, Clinical Application of Respiratory Care, Year Book, 1979.
3. Braunwald Eugene, Heart Disease – A Textbook of Cardiovascular Medicine, W.B Saunders.
4. Kapandji, The Physiology of the Joints- Annotated Diagrams of the Mechanics of the Human Joints, Churchill Livingstone.



## MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER I

### Physical and Functional Evaluation in Cardiopulmonary Disorders

**Paper: MPC-02**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25; Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

#### **Description:**

- Cardiopulmonary Assessment.
- A complete physical and functional diagnostic approach to patient presenting with the cardinal symptoms of cardiopulmonary diseases.
- Electrocardiography: Recording and evaluating ECG strip, Imaging Techniques: Chest radiography, Computed Tomography.
- Cardiopulmonary exercise testing: Principles of exercise testing, Exercise testing equipments and testing protocols, Maximal and sub maximal testing.
- Pulmonary Function Testing - Test of lung volumes and capacities, test of gas diffusion.
- Arterial Blood Gas Analysis – measurement of acid base status, Simple acid base disorders (Metabolic acidosis, metabolic alkalosis, respiratory acidosis, and respiratory alkalosis), Compensatory and Mixed acid base disorders.
- Cardiac catheterization and coronary angiography, Complication and risk associated with procedure.
- Special tests: Echocardiography - Principles of Echocardiography, M mode, two dimensional, Doppler and Transesophageal.
- MRI: An Introduction to MRI along with its technical considerations, Interpretation of MRI in various conditions; Ultrasonography.

- Bronchoscopy - Types of bronchoscopy, Indications, Procedure/ technique of bronchoscopy, Associated risks/ complications; Techniques for obtaining biological specimens like Sputum specimen and culture, Thoracentesis/Pleural aspiration and biopsy – indications, contraindications, interpretation of pleural fluid analysis.
- Multisystem assessment and Laboratory Investigations: Elements of multisystem investigation along with their normal values – Blood lipids, complete blood count, coagulation profile, electrolytes, blood urea nitrogen and creatinine, serum glucose.

**BOOKS RECOMMENDED:**

1. Jennifer A. Pryor, S Ammani Prasad, Physiotherapy for Respiratory and Cardiac Problems, Elsevier Health Sciences, 2002.
2. Goldberger, Clinical Electrocardiography- A simplified approach, Elsevier Health Sciences, 2006.
3. Steven A. Conrad, Gary T. Kinasewitz, Pulmonary Function Testing: Principles and Practice, Churchill Livingstone, 1984.
4. Dale Davis, Differential Diagnosis of Arrhythmias, W.B. Saunders

# **MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER I**

## **Clinicals/Journal Club - I**

**Paper: MPC-03**

**M. Marks: 100**

**Practical: 75**

**Internal Assessment: 25**

### **Section I: Case Presentation**

The students will have to present at least two case studies and two research studies in power point presentation form.

### **Section II: Clinical Posting**

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of the case studies assessed by them during the semester in a logbook.

**MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY, ORTHOPEDICS &  
NEUROLOGY) SEMESTER II**

**Skill Enhancing Studies**

**Paper: MPT-02**

**Time: 3 hrs**

**Max Marks: 100**

**Theory: 75**

**Internal Assessment: 25**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

**Description:**

**Unit I**

**Management and Ethics in Physiotherapy**

- Health care delivery system,
- Ownership and private practice in physiotherapy
- Organizing and engaging people in work setting
- Health care financial, planning and risk management
- Marketing and Information management
- History and Development, Professional conduct in Physiotherapy
- Standards of practice in Physiotherapy
- Morals and ethics
- Code of ethics, social and medical policy in health care
- Professional liability and obligation
- Legal responsibility and medico-legal action

## **Unit II**

### **Educational Technology**

- Educational aims, trends and issues
- Formal and informal education
- Philosophies of education – Naturalism, professionalism, idealism, realism
- Contemporary and modern philosophies of education
- Agencies of education
- Relationship between teaching and learning
- Theories of teaching
- Motivational process of learning perception, individual differences, intelligence personality
- Planning of teaching, strategies of teaching, organization, writing lesson plan
- Teaching methods
- A-V aids
- Programme evaluation, cumulative evaluation
- Nature of measurement of education, meaning, process, personnel, standardized, non-standardized
- Standardized tools, important tests of intelligence, aptitude, personality, instrument, achievements and status scale.

### **BOOKS RECOMMENDED:**

1. M. Ashraf Rizvi, Effective Technical Communication, Tata McGraw Hill Pbl.
2. Krishna Mohan and Meena Banerji, Communication Skills, Macmillan Pbl.
3. J M Synge, Riders to the Sea.
4. Bhushan Anand, Educational Technology, Bawa Publications, 2006.
5. Dr. Mangal S.K, Educational Technology, Tandon Publications, 2006
6. Sharma R.A, Essentials of E.T, Lyall Book Depot, 2004
7. Sharma R.A, Technology of teaching, Lyall Book Depot, 2004.
8. Elligworth, Educational Technology, Peerson, 2006.

**MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY, ORTHOPEDICS &  
NEUROLOGY) SEMESTER II**

**Exercise Physiology and Nutrition**

**Paper: MPT-03**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25: Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

**Description:**

- Energy sources- Carbohydrates, Proteins, Fats, Minerals and Vitamins. Metabolism of Carbohydrates, fats and proteins
- Energy balance, Regulation of Calorie Intake and Ideal Body weight, Pre-competition meal, fluid and energy replacement in prolonged exercise.
- Obesity–Body composition and assessment, Various diets to reduce Obesity and other exercise regimes - ACSM guidelines
- Aerobic process- Intensity, duration of Exercises and Calculation of VO<sub>2</sub> Max and its variability, How to estimate Aerobic Capacity
- Anaerobic process- Lactate Production, OBLA and Estimation of Anaerobic capacity, Oxygen Debt.
- Training Principles- Biological and Long term adaptations to training, Retraining recovery after exercise, Detraining, Overtraining
- Continuous training, Interval training, Endurance Training, Fartlek training, Plyometrics, Resistance training, Ballistic Stretching, Isokinetic training. Contraindications to physical training.
- Fatigue-Definition, types, causes and prevention. DOMS and its prevention. Deconditioning.

- Applied Work Physiology–MET, Classification of Exercise intensity based on MET. VO<sub>2</sub> max. Blood lactate and other parameters, factors affecting sustained physical work. Assessment of workload in relation to work capacity.
- Basal metabolic and resting metabolic rates and factors affecting them.
- Classification of physical activities based on energy expenditure. Daily rates of average energy expenditure. Energy expenditure at rest and during various physical activities e.g. sleeping, sedentary work, household work, walking, jogging, running and swimming.
- Measurement of energy cost of exercise–direct calorimetry, indirect calorimetry, net oxygen cost of aerobic and anaerobic exercise, MET, body size and energy cost.
- Factors Affecting Performance- High Altitude- Physiological changes and adaptations in high altitudes, high altitude disorders. Deep sea diving and Breath hold diving, Physiological changes and adaptations in deep sea diving, SCUBA, Consequences of Deep sea diving- Nitrogen bends, Oxygen Poisoning, CO poisoning and Hyperbaric oxygen therapy, Doping- Ergogenic and Ergolytic IOC banned substances. Tobacco smoking - circulatory effects, respiratory effects, metabolic effects, smoking habits among athletes. Caffeine, alcohol & Exercise.
- Cardiovascular system and exercise  
Athletes heart, cardiovascular adaptations to sustained aerobic exercises  
Lipids and sports, protection from coronary heart disease, exercise and optimization of lipid profile.  
Sudden cardiac death in sports  
Regulation of circulations during exercise
- Exercise and Respiratory system  
Athletes lungs  
Regulation of respiration during exercise
- Endocrine system responses to exercise: effects of exercise on various hormones in the body, hormone regulation of fluid and electrolytes during exercise, exercise & menstrual cycle.

### **BOOKS RECOMMENDED:**

1. William D. McArdle, Frank I.Katch, Victor L. Katch Exercise Physiology – Energy Nutrition and Human Performance Sixth Edition.
2. Lippincott Williams and Wilkins.
3. Exercise Physiology and Nutrition Jack H.Wilmore 3<sup>rd</sup> edition Churchill Livingstone.

## MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER II

### Medical and Surgical Aspects of Cardiopulmonary Conditions

**Paper: MPC-04**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25: Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

#### **Description:**

#### **Unit I**

- Obstructive lung diseases
- Restrictive lung diseases
- Suppurative lung diseases
- Infective lung diseases
- Respiratory tract infections
- Occupational and interstitial lung diseases
- Chest trauma
- Chest wall deformities & Neuromuscular disorders
- Lung cancers
- Children with respiratory dysfunction
- Diaphragmatic diseases & Abnormalities
- Sleep apnoea
- Hyperventilation syndrome
- Diseases of the Pleura



- Adult Respiratory Distress syndrome
- Alveolar Proteinosis
- Drug induced lung disease, Oxygen toxicity and related syndromes.
- Development disorders of the lung

## **Unit II**

- Congenital heart diseases
- Acquired heart diseases
- Ischemic heart disease
- Diseases of the myocardium
- Pericardial diseases
- Tumors of heart
- Vascular diseases
- Hypertension
- Diabetes and Heart disease
- Peripheral vascular diseases.

## **Unit III**

Thoracoscopy, video assisted thoracoscopy, lobectomy, pneumonectomy, thoracotomy, pleurodesis, pleurectomy, bullectomy, segmental resection.

CABG, angioplasty, repair of congenital defects, valvoplasties, pericardiectomy, aneurysectomy, cardiac transplant.

### **BOOKS RECOMMENDED:**

1. Crofton and Douglas's Respiratory Diseases Anthony Seaton Douglas Seaton 5<sup>th</sup> edition Blackwell Science.
2. Davidson's Principles and Practice of Medicine Christopher Haslet 19<sup>th</sup> edition Churchill Livingstone.
3. Braunwald's Heart Disease Zipes, Libby 7<sup>th</sup> edition Saunders.

## **MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER II**

### **Clinicals/Journal Club - II**

**Paper: MPC-05**

**M. Marks: 100**

**Practical: 75**

**Internal Assessment: 25**

#### **Section I: Case Presentation**

The students will have to present at least two case studies and two research studies in power point presentation form.

#### **Section II: Clinical Posting**

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of case studies assessed by them during the semester in a logbook.

## MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER III

### Cardiopulmonary Physiotherapy

**Paper: MPC-07**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25; Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

#### **Description:**

- Therapeutic Body Positioning: Indications and physiological effects of different body positions, Positioning in neonates/infants.
- Mobilization and Therapeutic Exercises: Physiological consequences of immobilization, Acute and long-term responses to mobilization and exercises, Exercise testing and training prescription Primary Cardiopulmonary dysfunction, Exercise testing and training prescription Secondary Cardiopulmonary dysfunction Clinical decision making in cardio-pulmonary therapeutics
- Breathing Exercises, Controlled Diaphragmatic breathing, Facilitation of ventilatory pattern and Breathing strategies, Chest wall mobilization, Ventilatory or respiratory muscle training. Re-patterning techniques.
- Glossopharyngeal Breathing, Pursed lip breathing, relaxed breathing, segmental breathing, indications for each technique.
- Bronchopulmonary hygiene techniques: Percussion, Vibration, Shaking, Quick Stretch coughing, huffing, Postural drainage. Indications, contraindications and precautions of each technique.
- Autogenic drainage, active cycle of breathing techniques.
- Physiological basis for Airway Clearance Techniques, Clinical application of airway clearance techniques and Facilitating airway clearance with coughing techniques
- Guidelines for the delivery of Cardiovascular and Pulmonary Physical Therapy Acute Conditions both medical and surgical including Peripheral vascular disorders

- Guidelines for the delivery of Cardiovascular and Pulmonary Physical Therapy Chronic conditions –Primary and Secondary Cardiopulmonary dysfunction
- Respiratory care Practice Review, Other techniques: Manual Hyperinflation and Airway Suction and its adjuncts like Saline Instillation and Bronchoalveolar Lavage
- Body Mechanics – The art of Positioning and Moving Patients
- The neonatal and Pediatric patient and the aging patient
- PNF techniques In Cardiopulmonary Physiotherapy

## MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER III

### Preventive Cardiology

**Paper: MPC-08**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25; Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

#### **Description:**

#### **Unit I**

- Cardiorespiratory Disability Evaluation: Definition of Impairment, disability and handicap; Guidelines for assessing pulmonary and cardiac impairment. Questionnaires like CCQ, SF36.
- Cardiorespiratory and Physical Fitness: An overview to physical activity, health and diseases.
- Effect of aging process in the performance of heart and lung.
- Effect of nutrition on heart, lungs and blood vessels.
- The role of physical activity in disease prevention
- Lifestyle modification.
- Role of nutrition and immunization in disease prevention.
- Role of physiotherapy in prevention and rehabilitation of patients with cardiorespiratory diseases.
- Public health approaches to communicable diseases.

#### **Unit II**

- Cardiovascular disease prevention - CINDI protocol, primary and secondary prevention of coronary heart disease.
- Body composition assessment.
- Community Cardiology and Pulmonology.

- Gymnasium and fitness: the concept behind healthy living.
- Aerobic and resistance training programs. Effects of different exercises on heart.
- Disease Prevention Programs in India.
- Telemedicine: An introduction to telemedicine, types of telemedicine, Guidelines and standards for the practice of Telemedicine in India, Scope of practice and future prospects.

## **MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER III**

### **Dissertation-I**

**Paper: MPC-09**

**M.Marks:100**

**Practical: 75**

**Internal Assessment: 25**

1. The students have to prepare a research proposal of the research project to be undertaken.
2. Students have to submit the soft and hard copy of the research proposal.
3. Power point presentation of the research proposal for the ethical committee clearance.
4. Students have to complete the data collection by the end of this semester.
5. Power point presentation of the research work completed till the end of this semester.

## **MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER III**

### **Practical**

**Paper: MPC-10**

**M. Marks: 100**

**Practical: 75**

**Internal Assessment: 25**

The students will be undergoing a viva-voce related to the entire semester subjects and dissertation covered till the end of this semester.



## **MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER III**

### **Clinicals/Journal Club – III**

**Paper: MPC-11**

**M. Marks: 100**

**Practical: 75**

**Internal Assessment: 25**

#### **Section I: Case Presentation**

The students will have to present at least two case studies and two research studies in power point presentation form.

#### **Section II: Clinical Posting**

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of case studies assessed by them during the semester in a logbook.

## MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER IV

### Cardiac and Pulmonary Rehabilitation

**Paper: MPC-12**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25; Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

#### **Description:**

#### **Unit I**

##### **Cardiac Rehabilitation**

- Cardiac Rehabilitation: Historical Background, objectives and definition of cardiac rehabilitation, Patients selection and risk stratification.
- Phases of Cardiac Rehabilitation
- An overview of Inpatient program and emphasizing outpatient program along with its structure and content, Rehabilitation of special patient population (angina or silent ischemia and chronic heart failure etc).
- Education and Psychological aspects of Cardiac Rehabilitation, Dietary aspects of Cardiac Rehabilitation, Outcomes of cardiac rehabilitation.
- Transplant Patient Rehabilitation Advanced techniques in cardiac rehabilitation and Rehabilitation for Pediatric and Geriatric age groups.

#### **Unit II**

##### **Pulmonary Rehabilitation**

- Pulmonary Rehabilitation: Principal goals and rationale of pulmonary rehabilitation, Patients' selection and assessment.

- Measurement of respiratory and peripheral muscle strength, assessment of performance of ADL and health status.
- Education and Life style management in Pulmonary Rehabilitation.
- Nutritional and psychological aspects and recent advances in Pulmonary Rehabilitation. Pulmonary Rehabilitation in specific disorders.

## MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER IV

### Modalities and Interventions in ICU

**Paper: MPC-13**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25; Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

#### **Description:**

- Monitoring Systems in I.C.U invasive and non-invasive cardio-respiratory equipments for monitoring vital signs, Pulse oximetry, Transcutaneous PO<sub>2</sub> and PCO<sub>2</sub>, Capnometry.
- Intensive care unit management of individuals with Primary cardiopulmonary dysfunction (principles, mobilization, positioning, secretion clearance, specific maneuvers).
- ICU management of secondary cardiopulmonary dysfunction (obesity, musculoskeletal trauma, head injuries, spinal injuries, burns etc.).
- Care of unconscious patient.
- Special precautions during physiotherapy treatment of various conditions in ICU.
- Physiotherapy management in pediatric and neonatal ICU.
- Complications, Adult Respiratory distress syndrome, acute asthma, shock, sepsis, and multiorgan system failure.
- ICU management of Neurologic disorders, Essentials for ICU Patient: Patient safety concerns and infection Control.
- Basic and Advanced airway tubes, Monitoring of chest tube drainage and underwater seal system.

- Emergency management of airways: Manual Resuscitators, Suction equipments and suction catheters, Types of oropharyngeal airways, Endotracheal intubation, Care of the patient with an Artificial Airway. Extubation and post extubation care.
- Respiratory Therapy Procedures: Gas delivery system i.e. Regulators, Flow meters, Oxygen therapy - its clinical indications, hazards and complications, various oxygen delivery devices (invasive and non-invasive). Symptoms of hypoxia and carbon dioxide narcosis.
- Mechanical Ventilation, indications and contraindications, complications, overview of modes, CPAP and Bi-PAP, Positive End Expiratory Pressure and its significance and detrimental effects. Weaning of patient from ventilator. Care of patient with mechanical ventilation.
- Humidifiers – Principles of operation and clinical indications for humidity therapy, Devices used for humidification; Aerosol drug therapy.
- Advanced Cardiac care: Cardiac Pacemaker – its indications, safety measures and care and Cardioverter Defibrillators.
- Basic Life Support and Advanced Cardiac Life Support: Defibrillator (Types, Waveforms and How to give DC shock).

**MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER IV**

**Dissertation-II**

**Paper: MPC-14**

**M. Marks: 200**

**Practical: 150**

**Internal Assessment: 50**

1. The candidate shall prepare 4 hard and 3 soft (CDs) copies of the dissertation and submit the same to the department office on or before the last working day of this semester.
2. Power point presentation of the complete research work.

**MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER IV**

**Practical**

**Paper: MPC-15**

**M. Marks: 200**

**Practical: 150**

**Internal Assessment: 50**

The students will be undergoing a viva-voce related to the entire semester subjects and dissertation.

## **MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER IV**

### **Clinicals/Journal Club – IV**

**Paper: MPC-16**

**M. Marks: 100**

**Practical: 75**

**Internal Assessment: 25**

#### **Section I: Case Presentation**

The students will have to present at least two mandatory case studies and two research studies in power point presentation form.

#### **Section II: Clinical Posting**

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of case studies assessed by them during the semester in a logbook.



**MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY, ORTHOPEDICS &  
NEUROLOGY) SEMESTER I**

**Research methodology & Biostatistics**

**Paper: MPT-01**

**Time: 3 hrs**

**Max Marks: 100**

**Theory: 75**

**Internal Assessment: 25**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

**Description:**

Research in physiotherapy: Introduction, Need for Research in Physical Therapy, Research Definition, Concepts, Purpose and Significance, Types of Research, Ethical issues in Research.

Research Design: Meaning, Need, Features and Various concepts relating to research design, Types of research design, research Approaches: Quantitative and Qualitative- assumptions and problems, Experimental design: Basic principles of experimental research designs, single system and group or Multiple factor design- Problems, Characteristics and limitations, Non Experimental design: Survey research-Scope, types & Implementation. Clinical case reports, Qualitative Research designs & methods

Research Process: Research problems, Questions and Hypothesis, Various steps involved in Research process, criteria of good research and problems encountered by researchers.

Measurement of Scaling techniques: Measurement in Research- Definition, Various Scales, Errors in Measurement and Scaling Technique, Reliability and validity in research.

Methods of Data Collection: Types of Data sources- Primary and secondary. Collection of Primary data (Observation and Oral Interview method, Questionnaire, Schedules); Collection of secondary data (published and unpublished sources)

Statistical Reasoning, Processing & Analysis: Introduction to Data set, Frequency Distribution, Central tendency, Variability in Distribution, Measures of Asymmetry (Skewness), Measures of Relationship, Correlation-Simple, Partial and Multiple. Regression - Simple and Multiple.

Sampling Fundamentals: Basic concepts, Need of sampling, Sample design- Steps in Sample Design, Characteristics of Good Sample Design, Types of Sampling.

Sampling Theory: Principles of Sampling, Sampling and Non Sampling Errors, Theory of Estimation, Sampling Distributions, Central limit theorem, Sample size & its determination.

Measures of Central Tendency and Dispersion- Arithmetic mean, median, mode and standard deviation (application).

Correlation and Regression: Karl Pearson's correlation method, Rank correlation method, Regression Equation and their coefficients (numerical)

Hypothesis Testing: Null Hypothesis, Alternative Hypothesis, Acceptance and Rejection Region, Level of Significance, Type I & II errors, Hypothesis Testing for Means, Sample Proportions and Variances, Chi-Square Test for comparing variances, Conditions and steps involved in applying Chi-Square Test, Analysis of Variance (ANOVA)- Basic Principles Techniques, Coding Method, Two way ANOVA and Analysis of Covariance (ANCOVA); Importance and characteristics of Non Parametric or Distribution- Free Tests.

Parametric and Non-Parametric Tests (Simple Applications): Z-test, t-test, F-test, chi-square test, ANOVA (One way and two way), ANCOVA, Spearman's rank Correlation and Kendall's Coefficient of Concordance.

Multivariate Analysis Techniques: Characteristics, Classifications and Variables in Multivariate Analysis, Techniques of Factor Analysis.

Writing an Research Proposal, Critiquing a Research Article: Defining a problem, Locating the Literature, Types of Literature, Evaluating Literature- Evaluating Single Studies and Review Articles, Elements of Research article- Inclusion and Exclusion Criteria, Funding, Data Collection & Analysis, Results, Interpretation, Conclusion, Discussions.

Interpretation and Report writing: Meaning, Techniques, Precautions, Significance, Steps and Types

Publication and Presentation of Research

### **BOOKS RECOMMENDED:**

1. Cooper D.R and Schindler, P.S., Business Research Method, Tata McGraw Hill Publishing Co.
2. Carolyn. M. Hicks, Research for Physiotherapists, Project Design and Analysis, Elsevier Health Sciences, Second Edition.
3. C.R Kothari. Research Methodology- Methods and Techniques, New Age International Limited, Publishers, Second Edition.

# MASTER OF PHYSIOTHERAPY (ORTHOPEDICS) SEMESTER I

## Basic Medical Sciences

**Paper: MPO-01**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25: Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

### **Description:**

#### **Unit I**

### **APPLIED ANATOMY**

- Review of anatomy of various components of musculoskeletal system
- Joints – classification, structure of joints, movements, range, limiting factors, stability blood supply, nerve supply, and its applied anatomy.
- Origin, insertion, nerve supply and action of all important muscles related to human movement.
- Spine – Vertebral column development, structure, joints, muscles of back, applied and functional anatomy
- Brief description of Upper & lower extremity, thorax, abdomen, pelvis, head, neck and brain.
- A review of organization and regulation of motor system- types of movement and factors affecting contact and range of motion at synovial joints, skeletal muscle fibres- composition, structure and characteristics, muscle metabolism, contraction and relaxation of muscle, control of muscle tension
- Anatomy of certain diseases- common dislocations, low back pain, sciatica, lesions of inter-vertebral disc, anatomical and physiological loss resulting from nerve injury, peripheral

nerve entrapment(such as carpal tunnel syndrome, cubital tunnel syndrome, tarsal tunnel syndrome, Morton neuroma), spinal infection.

## **Unit II**

### **BIOMECHANICS**

- Introduction to human biomechanics- definition of mechanics and biomechanics, principle of biomechanics, nature and importance of biomechanics in physiotherapy, elasticity- definition, stress, strain HOOKE'S law.
- Biomechanics of upper and lower extremity- biomechanics of shoulder, elbow, wrist and hand motion, pelvic, hip, knee, ankle & foot motion.
- Biomechanics of spinal region- biomechanics of cervical, thoracic, lumbosacral, sacroiliac joint.
- Definition, aims, objectives and role of kinesiology in physiotherapy, review of fundamental concepts (applied aspects), centre of gravity, line of gravity, planes, lever system in body, fundamental starting positions.
- Ligament & Tendon mechanics: Structure and composition, Mechanical properties and physiological properties. Cross sectional area measurements Muscle tendon properties Temperature sensitivity
- Joint mechanics : Joint design ,Joint categories ,Joint function - Arthrokinematics - Osteokinematics - Kinematic chains Open Closed Joint forces, equilibrium and distribution of these forces , Joint stability and its mechanics Clinical applications.
- Gait: Normal Gait and its determinants Gait parameter - Kinetic - Kinematics - Time-Space Pathological gait with emphasis on polio, cerebral palsy, dystrophies, hemi paresis, Para paresis Running Stair climbing Changes in gait following various surgeries/ diseases/ disorders
- Kinematics: Types of motion (accessory and joint play of axial and peripheral skeletal) Location of motion (instantaneous axis of movement, shifting axis of movement) Magnitude of motion(factors determining it) Direction of motion, distance and speed, displacement and velocity, acceleration, angular distance and angular displacement, angular speed, angular velocity, angular acceleration, inertia, mass, weight, Newton's laws of motion. Angular motion and its various parameters, linear motion and its various parameters, Projectile motions.
- Kinetics : Definition of forces Force vectors (composition, resolution, magnitude) Naming of Force (gravity and anti-gravity force, JFR), Force and its characteristics, internal and external forces, classification of force system, composition and resolution of forces, impact, elasticity, principles of spin and rebound, eccentric forces, moment,

principles of lever, rotator forces, force of gravity and methods to find COG, COG Stability Reaction forces Equilibrium & BALANCE Linear forces system, Friction and its various parameters Parallel force systems, Concurrent force systems, Work power and energy, Moment arms of force & its application, Force components Equilibrium of force, principles of projectile.

- Posture: dynamic and static posture, kinetic and kinematics of posture, analysis of posture, effect of age, pregnancy, occupation on posture.
- Mechanical energy, work and power: Definitions Positive and Negative work of muscles, Muscle mechanical power, Causes of inefficient movement - Co-contractions - Isometric contraction against gravity jerky movement - Energy generation at one joint and absorption at another - Energy flow and Energy system used by the body - Energy storage
- Advanced Biomechanics and kinesiology
- Introduction to biomechanical analysis of human motion.
- Analytical tools and techniques – Isokinetic Dynamometer, Kinesiological EMG, Electronic Goniometer, Force Platform, Videography, Algometer

### **Unit III**

#### **Physiology**

- Physiology of musculoskeletal systems: Fiber length and cross section area. Biophysics of contractile and non contractile tissues, Response to mechanical loading.
- Mechanical properties of various muscles. Types of muscle contractions (static, concentric, eccentric), two joint muscles, angle of pull, role of gravity affecting muscular action. EMG changes during fatigue and contraction.
- Changes in mechanical and physiological properties because of ageing, exercise and immobilization, dystrophies and pathological conditions.
- Blood: the various components of blood, viscosity correlation, oxyhemoglobin dissociation curves, interrelationship between pressure flow and resistance.
- Cardiovascular system: cardiac cycle, cardiac output and its regulation, cardiac output in normal stress conditions, methods of measuring cardiac output, oxygen demand theory of local blood flow circulation, mechanism of arterial pulse regulation, hypertension, normal coronary blood flow along with variations, the cardiac reserve, physiological causes of shock.
- Respiratory system: review of mechanics of respiration, pulmonary volumes and capacities, transport of oxygen in blood, carbon dioxide in blood, regulation of

respiration, respiratory abnormalities hypoxia, hypercapnoea, artificial respiration, disorders of respiration- dysnoea, orthopnoea, hyperventilation, apnoea, tachypnea, respiratory changes during exercise

- Endocrine system: physiology of the endocrine glands– pituitary, pineal body, thyroid, parathyroid, adrenal, thymus, pancreas, testes& ovary. Hormones secreted by these glands, their classifications and functions.
- Cell injuries: aetiology and pathogenesis with a brief recall of important aspects of normal cell structure, reversible cell injury, irreversible cell injury, pathologic calcification, Inflammation.
- Repair, wound healing by primary and secondary union, factors promoting and delaying the process, healing in specific site including bone healing. ‘Failed’ healing responses, repair of soft tissue injuries, principles of drug action, basic pharmacokinetics and pharmacodynamics.

## **UNIT IV**

### **PHARMACOLOGY**

- Drugs used in Orthopedic conditions
  - a. Analgesics
  - b. Muscle relaxants
  - c. corticosteroids
  - d. Non-steroidal anti- inflammatory drugs (NSAIDs)
  - e. Disease modifying antirheumatic drugs (DMARDs)
- The use of drugs in various cardiovascular disorders.
- The use of drugs in various neurological disorders.
- The use of drugs in various respiratory disorders.

### **BOOKS RECOMMENDED:**

1. Arthur Clifton Guyton, John Edward Hall, Textbook of Medical Physiology, Saunders, 2000.
2. Kapandji, The Physiology of the Joints- Annotated Diagrams of the Mechanics of the Human Joints, Churchill Livingstone
3. Williams & Warwick Gray’s Anatomy - - Churchill Livingstone.
4. Snells , Clinical Anatomy for Medical Students - – Lippincott.

5. The Pharmacological basis of Therapeutics - Goodman and Gilman - MacMillan.
6. Joint structure and function- a comprehensive book -Cynthia Norkin
7. Kisner and Colby: Therapeutic Exercises- Foundations and Techniques. F.A. Davis

## MASTER OF PHYSIOTHERAPY (ORTHOPEDECS) SEMESTER I

### Physical and Functional Evaluation in Musculoskeletal Disorders

**Paper: MPO-02**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25: Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

#### **Description:**

- Review of General Musculoskeletal assessment – patient's history, observation, palpation and examination.
- Specific scales according to orthopedic disorders.
- Sensory and Motor assessment
- Balance assessment: scales, Balance Outcome measures and their administration.
- Assessment of Tone, flexibility, tightness of musculoskeletal tissues, end-feel
- Muscle Length Testing and special tests
- Reflex testing
- Limb length measurement: recent methods for assessment and its clinical applications
- Postural assessment methods and common deviations from the normal
- Clinical Gait assessment (observational methods and EMG gait analysis)
- Functional assessment



- Brief review of imaging techniques: X-Ray, MRI, CT, ultrasonography, Biopsy report reading and analysis. Imaging of head, neck, spine, thorax and abdomen, upper and lower extremity.
- Examination and assessment of geriatric patient
- Examination and assessment of Upper Extremity, lower extremity & Examination of Spine
- Sports assessment and training.

**BOOKS RECOMMENDED:**

1. Robert A Donatelli, Orthopaedic Physiotherapy, Churchill Livingstone.
2. Susan Sullivan, Physical Rehabilitation Assessment and Treatment, Jaypee brother
3. David J Magee, Orthopaedic Physical Assessment, Saunders
4. Carolyn Wadsworth, Manual Examination and Treatment of the Spine and Extremities, Williams and Wilkins.
5. Ronald C Evans, Illustrated Orthopaedic physical Assessment, Mosby.

## **MASTER OF PHYSIOTHERAPY (ORTHOPEDICS) SEMESTER I**

### **Clinicals/Journal Club - I**

**Paper: MPO-03**

**M. Marks: 100**

**Practical: 75**

**Internal Assessment: 25**

#### **Section I: Case Presentation**

The students will have to present at least two case studies and two research studies in power point presentation form.

#### **Section II: Clinical Posting**

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of the case studies assessed by them during the semester in a logbook.

**MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY, ORTHOPEDICS &  
NEUROLOGY) SEMESTER II**

**Skill Enhancing Studies**

**Paper: MPT-02**

**Time: 3 hrs**

**Max Marks: 100**

**Theory: 75**

**Internal Assessment: 25**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

**Description:**

**Unit I**

Management and Ethics in Physiotherapy

- Health care delivery system,
- Ownership and private practice in physiotherapy
- Organizing and engaging people in work setting
- Health care financial, planning and risk management
- Marketing and Information management
- History and Development, Professional conduct in Physiotherapy
- Standards of practice in Physiotherapy
- Morals and ethics
- Code of ethics, social and medical policy in health care
- Professional liability and obligation
- Legal responsibility and medico-legal action

## **Unit II**

### Educational Technology

- Educational aims, trends and issues
- Formal and informal education
- Philosophies of education – Naturalism, professionalism, idealism, realism
- Contemporary and modern philosophies of education
- Agencies of education
- Relationship between teaching and learning
- Theories of teaching
- Motivational process of learning perception, individual differences, intelligence personality
- Planning of teaching, strategies of teaching, organization, writing lesson plan
- Teaching methods
- A-V aids
- Programme evaluation, cumulative evaluation
- Nature of measurement of education, meaning, process, personnel, standardized, non-standardized
- Standardized tools, important tests of intelligence, aptitude, personality, instrument, achievements and status scale.

### **BOOKS RECOMMENDED:**

1. M. Ashraf Rizvi, Effective Technical Communication, Tata McGraw Hill Pbl.
2. Krishna Mohan and Meena Banerji, Communication Skills, Macmillan Pbl.
3. J M Synge, Riders to the Sea.
4. Bhushan Anand, Educational Technology, Bawa Publications, 2006.
5. Dr. Mangal S.K, Educational Technology, Tandon Publications, 2006
6. Sharma R.A, Essentials of E.T, Lyall Book Depot, 2004
7. Sharma R.A, Technology of teaching, Lyall Book Depot, 2004.
8. Elligworth , Educational Technology, Peerson, 2006.

**MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY, ORTHOPEDICS &  
NEUROLOGY) SEMESTER II**

**Exercise Physiology and Nutrition**

**Paper: MPT-03**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25: Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

**Description:**

- Energy sources- Carbohydrates, Proteins, Fats, Minerals and Vitamins. Metabolism of Carbohydrates, fats and proteins.
- Energy balance, Regulation of calorie Intake and Ideal Body weight, Pre-competition meal, fluid and energy replacement in prolonged exercise.
- Obesity–Body composition and assessment, Various diets to reduce Obesity and other exercise regimes - ACSM guidelines.
- Aerobic process- Intensity, duration of Exercises and Calculation of VO<sub>2</sub> Max and its variability, How to estimate Aerobic Capacity.
- Anaerobic process- Lactate Production, OBLA and Estimation of Anaerobic capacity, Oxygen Debt.
- Training Principles- Biological and Long term adaptations to training, Retraining recovery after exercise, Detraining, Overtraining.
- Continuous training, Interval training, Endurance Training, Fartlek training, Plyometrics, Resistance training, Ballistic Stretching, Isokinetic training. Contraindications to physical training.

- Fatigue-Definition, types, causes and prevention.DOMS and its prevention. Deconditioning.
- Applied Work Physiology–MET, Classification of Exercise intensity based on MET. VO2 max. Blood lactate and other parameters, factors affecting sustained physical work. Assessment of workload in relation to work capacity.
- Basal metabolic and resting metabolic rates and factors affecting them.
- Classification of physical activities based on energy expenditure. Daily rates of average energy expenditure. Energy expenditure at rest and during various physical activities e.g. sleeping, sedentary work, household work, walking, jogging, running and swimming.
- Measurement of energy cost of exercise–direct calorimetry, indirect calorimetry, net oxygen cost of aerobic and anaerobic exercise, MET, body size and energy cost.
- Factors Affecting Performance- High Altitude- Physiological changes and adaptations in high altitudes, high altitude disorders. Deep sea diving and Breath hold diving, Physiological changes and adaptations in deep sea diving, SCUBA, Consequences of Deep sea diving- Nitrogen bends, Oxygen Poisoning, CO poisoning and Hyperbaric oxygen therapy, Doping- Ergogenic and Ergolytic IOC banned substances. Tobacco smoking - circulatory effects, respiratory effects, metabolic effects, smoking habits among athletes.Caffeine, alcohol & Exercise.
- Cardiovascular system and exercise  
  - Athletes heart, cardiovascular adaptations to sustained aerobic exercises. Lipids and sports, protection from coronary heart disease, exercise and optimization of lipid profile.
  - Sudden cardiac death in sports
  - Regulation of circulations during exercise
- Exercise and Respiratory system  
  - Athletes lungs
  - Regulation of respiration during exercise
- Endocrine system responses to exercise: effects of exercise on various hormones in the body, hormone regulation of fluid and electrolytes during exercise, exercise & menstrual cycle.

**BOOKS RECOMMENDED:**

1. William D. McArdle , Frank I.Katch, Victor L. Katch Exercise Physiology – Energy Nutrition and Human Performance Sixth Edition.
2. LippinCottWilliams and Wilkins.
3. Exercise Physiology and Nutrition Jack H.Wilmore 3rd edition Churchill Livingstone.

## MASTER OF PHYSIOTHERAPY (ORTHOPEDECS) SEMESTER II

### Medical and Surgical Aspects of Orthopedic Conditions

**Paper: MPO-04**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25: Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

#### **Description:**

#### **Unit I**

1 Introduction, causes, mechanism, epidemiology of disease pattern, Patho physiology, Clinical presentation, conservative and surgical management, preventive measures & complications of the following clinical conditions:

- General Musculoskeletal Disorders
- Regional musculoskeletal Disorders
- Congenital malformations
- Rheumatic disorders
- Infections of musculoskeletal system
- Metabolic and endocrine disorders
- Tumors of the musculoskeletal system
- Neuromuscular disorders
- Disorders and malformations in spine
- Degenerative disorders



- Developmental disorders
- Bony and soft tissues disorders.
- Fractures and dislocations of upper limb
- Fractures and dislocations of lower limb
- Fractures and dislocations of spine and Hand
- Spinal cord injuries: types, classification, examination.

II Parameters used to determine diagnosis of postural disorders of spine, upper extremity and lower extremity.

III Orientation and Introduction, physical basis, normal result & common abnormal response of the procedures done for musculoskeletal conditions (in brief): X- ray, Computerized Tomography, Magnetic Resonance Imaging, Bone Scan, Laboratory tests, FNAC, Bone biopsy

## **UNIT- II**

- Orientation and General Principles of Orthopaedic surgery: Arthrodesis, Osteotomy, Arthroplasty, Bone grafting, Correction of bone deformities and joint contractures, Tendon transfers, Nerve suturing and grafting, replacements, Fracture management- first aid and advance action.

### **BOOKS RECOMMENDED:**

1. Weinstein SL and BuckwalterJA ,Turek'sOrthopaedics: Principles and their Application , Lippincott
2. Louis Solomon, Apley's System of Orthopaedics and Fractures , Arnold publishers.
3. Adams, Textbook of Orthopaedics, Churchill Livingstone
4. Brent Brotzman, Clinical Orthopaedic Rehabilitation.
5. Robert A Donatelli, Orthopaedic Physiotherapy, Churchill Livingstone.
6. Textbook of Orthopaedics, John Ebnezar, Japee Brothers.

## **MASTER OF PHYSIOTHERAPY (ORTHOPEDECS) SEMESTER II**

### **Clinicals/Journal Club - II**

**Paper: MPO-05**

**M. Marks: 100**

**Practical: 75**

**Internal Assessment: 25**

#### **Section I: Case Presentation**

The students will have to present at least two case studies and two research studies in power point presentation form.

#### **Section II: Clinical Posting**

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of case studies assessed by them during the semester in a logbook.

## MASTER OF PHYSIOTHERAPY (ORTHOPEDECS) SEMESTER III

### Physiotherapy Management in Orthopedic Conditions

**Paper: MPO-07**

**Time: 3 hrs**

**Max. Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25: Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

#### **Description:**

#### **Unit I**

Physiotherapeutic management of following:

- General Musculoskeletal Disorders
- Regional musculoskeletal Disorders
- Congenital malformations
- Rheumatic disorders
- Infections of musculoskeletal system
- Metabolic and endocrine disorders
- Tumors of the musculoskeletal system
- Neuromuscular disorders
- Disorders and malformations in spine
- Degenerative disorders
- Developmental disorders

- Bony and soft tissues disorders.
- Fractures and dislocations of upper limb
- Fractures and dislocations of lower limb
- Fractures and dislocations of spine and Hand
- Spinal cord injuries- types, classifications, examination and management.

## **Unit II**

- Method of different types of common surgeries and its Physiotherapy management : Meniscectomy, Patellectomy, Arthroplasties, Arthrodesis, Spinal Fusion, Osteotomies, bone grafting, bone lengthening, nerve repair and grafting, internal and external fixations, distraction and limb reconstruction.
- Orthopedic implants: design, material, indications, pre and post op complications.
- Rehabilitation of Burns
- Amputation: Types, Levels & procedures, Pre and postoperative rehabilitation, Prosthesis and stump care, Limb transplantation Surgery.

## **Unit III**

- Parameters used to determine, diagnosis and management of postural disorders of spine, upper extremity, lower extremity.
- Correction of gait disorders.
- Fracture management- first aid and advance action.

## **Unit IV**

Human Kinesiology: definitions, aims, objectives and role of kinesiology in Physiotherapy, fundamental starting positions, framework of the body, origin, insertion, nerve supply and action of all the important muscles related to human movement, impact, principles of spin and rebound, methods of finding center of gravity, principles of equilibrium and projectile.

### **BOOKS RECOMMENDED:**

1. Weinstein SL and Buckwalter JA, Turek's Orthopaedics: Principles and their Application, Lippincott
2. Louis Solomon, Apley's System of Orthopaedics and Fractures, Arnold publishers.
3. Physical Examination of the Spine and Extremities (Hoppenfield, Physical Examination of the Spine and Extremity)
4. Management of Common Musculoskeletal Disorders: Physical Therapy Principles and Methods (Management of Common Musculoskeletal Disorders (Hertling)
5. Textbook of Orthopaedics, Adams: Churchill Livingstone
6. Clinical Orthopaedic Rehabilitation, Brent Brotzman
7. Textbook of Orthopaedics, Adams: Churchill Livingstone
8. Textbook of Orthopaedics, John Ebnezar, Japee Brothers
9. Principle and Practice of Orthopaedics Sports Medicine, William E Garrett, Lippincott William and Wilkins
10. Kinesiology and applied anatomy, Lee and Fabiger. 2002

## MASTER OF PHYSIOTHERAPY (ORTHOPEDECS) SEMESTER III

### General Orthopedic Physiotherapy

**Paper: MPO-08**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25: Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

#### Unit I

- Review of Basic Techniques: Stretching (principals and methods), Strengthening (principals and methods), Passive movements testing and end feel assessment, Active exercise training, its benefits and various methods, Assisted resisted exercise training, Resisted exercise training. Its uses and disadvantages in comparison with other forms of exercise training, Introduction to manual therapy- joint techniques, basic principles of manipulation for various disorders of the spine and extremities. Postural Re-education (methods and techniques), Pain management with emphasis on pain of peripheral origin and Central origin.
- Principle of therapeutic exercises: Definition, details of effects and uses of following exercises:
  - a. Dynamic Exercises
  - b. Plyometric Exercises
  - c. Isokinetic Exercises
  - d. Kinetic chain exercises
  - e. PRE
- Review of Principles underlying the application of following modalities with reference to their Production, biophysical and therapeutic effects, indications and contraindications and the

specific uses of: Superficial heating modalities, deep heating modalities, Ultrasound, infrared rays, paraffin wax bath, moist heat pack, fluidotherapy, LASER, UVR, Low Frequency Current: direct current, modified direct current, alternative current, Diadynamic Current, Iontophoresis, High Voltage Pulsed Galvanic Stimulation, TENS, medium frequency current, IFT, Russian Currents. High frequency current: SWD, MWD, Ultrasound.

- Hydrotherapy- physiological effects, raising temperature baths, baths with additives, whirlpool bath. Rehabilitation approach using hydrotherapy.
- Cryotherapy- physiological effects, use of cold therapy in acute phase, rehabilitative phase, preventive phase of injury, methods of application, indications and contraindications.
- Advanced Electro Therapeutics in Tissue healing, Wound care, Management of Scars keloids, Muscle Plasticity & Integumentary Conditions.
- BIO-FEED BACK, extracorporeal shock wave, magneto therapy, light therapy, long wave diathermy, gait analysis.

## **UNIT II**

- Electro diagnosis: introduction to methods of electro diagnosis SD CURVE
- Electromyography: technique of EMG, interpretation of normal and abnormal responses
- Nerve conduction studies: MNCV, SNCV, variables affecting nerve conduction, measurement of NCV of nerves of upper limb and lower limb, interpretations of normal and abnormal responses. Evoked potentials, H-reflex, P wave, repetitive nerve stimulation, VEP, BAEP, SSEP

## **BOOKS RECOMMENDED**

1. Kisner and Colby: Therapeutic Exercises – Foundations and Techniques, F.A.Davis.
2. Basmajian John V.: Therapeutic Exercise, Williams & Wilkins.
3. Kendall: Muscles – Testing and Function - Williams & Wilkins
4. Daniels and Worthinghams: Muscle Testing – Techniques of Manual examination, W.B. Saunders.
5. Dvir: Isokinetics: Muscle Testing, Interpretation and Clinical Applications, W.B.Saunders
6. William E. Prentice: Therapeutic Modalities in Sports Medicine - Mosby.
7. William E. Prentice: Rehabilitation Techniques - Mosby.

8. Claytons Electrotherapy 10th Ed. - Sarah & Bazin - W.B. Saunders
9. Nelson and Currier: Clinical Electrotherapy, Prentice Hall. B. Saunders
10. Lehmann- Therapeutic Heat and Cold- Williams & Wilkins, 4th ed, 1990.
11. Michlovitz- Thermal Agents in Rehabilitation- F.A. Davis, 1996



## **MASTER OF PHYSIOTHERAPY (ORTHOPEDECS) SEMESTER III**

### **Dissertation-I**

**Paper: MPO-09**

**M. Marks: 100**

**Practical: 75**

**Internal Assessment: 25**

1. The students have to prepare a research proposal of the research project to be undertaken.
2. Students have to submit the soft and hard copy of the research proposal.
3. Power point presentation of the research proposal for the ethical committee clearance.
4. Students have to complete the data collection by the end of this semester.
5. Power point presentation of the research work completed till the end of this semester.

## **MASTER OF PHYSIOTHERAPY (ORTHOPEDICS) SEMESTER III**

### **Practical**

**Paper: MPO-10**

**M. Marks: 100**

**Practical: 75**

**Internal Assessment: 25**

The students will be undergoing a viva-voce related to the entire semester subjects and dissertation covered till this semester.

## **MASTER OF PHYSIOTHERAPY (ORTHOPEDECS) SEMESTER III**

### **Clinicals/Journal Club – III**

**Paper: MPO-11**

**Max. Marks: 100**

**Practical: 75**

**Internal Assessment: 25**

#### **Section I: Case Presentation**

The students will have to present at least two case studies and two research studies in power point presentation form.

#### **Section II: Clinical Posting**

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of case studies assessed by them during the semester in a logbook.

## MASTER OF PHYSIOTHERAPY (ORTHOPEDECS) SEMESTER IV

### Bioengineering and Rehabilitation Principles

**Paper: MPO-12**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50(Th-25, Prac-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

#### **Description:**

#### **UNIT -I**

- Conceptual framework of rehabilitation, roles of rehabilitation team members, definitions and various models of rehabilitation. International classification of functioning
- Epidemiology of disability with emphasis on locomotor disability, impact of disability on individual, family, and society.
- Preventive aspects of disability and organizational skills to run disability services
- Model of service delivery: feature, merits and demerits of institutional based rehabilitation, outreach programmes, Community based rehabilitation
- Legal Aspect in Disabilities: PWD act, national trust act, RCI act, Statutory provisions Schemes of assistance to persons with disabilities
- Govt and NGO participation in disability RCI
- WCPT guidelines
- Principles of Orthotics- types, indications, contra indications, assessment (check out), uses and fitting –region wise: Orthotics for the Upper Limb, lower limb and spine.

- Principles of prostheses- types, indications, contra indications, assessment (check out), uses and fitting –region wise.

## **UNIT- II**

- An outline of principles and methods of rehabilitation of speech and hearing disability
- An outline of principles and methods of vocational and social rehabilitation
- An outline of principles and methods of rehabilitation of mentally handicapped
- An outline of principles, methods and scope of occupational therapy
- Architectural Barriers: Describe architectural barriers and possible modifications with reference to Rheumatoid Arthritis, CVA, Spinal Cord Injury and other disabling conditions.
- An outline of the principles and process of disability evaluation
- Physiotherapy in home setting and use of assistive aids, external aids, appliances, and adaptive self-help devices: Prescription, biomechanics, checkout and training.
- Community based rehabilitation in musculoskeletal disorders.
- Wheelchair prescription and advanced skills
- Transfer technique

## **Unit III**

- Activities of daily living (ADLs)
- Professional ethics for physiotherapist: concept of morality, ethics and legality, professionalism, sexual and physical abuse, social characteristics and personal relationships, professional issues, client interest and satisfaction, confidence and communication, malpractice, negligence, rights of patients, status of physiotherapist in health care.

## **BOOKS RECOMMENDED**

1. Lusardi, Orthotics and Prosthetics in Rehabilitation, 2e, Elsevier.
2. Nawoczeski, Orthotics in Functional Rehabilitation of the Lower Limb. Elsevier
3. Susan Sullivan, Physical Rehabilitation Assessment and Treatment, Jaypee brothers

## MASTER OF PHYSIOTHERAPY (ORTHOPEDECS) SEMESTER IV

### Approaches in Musculoskeletal Physiotherapy

**Paper: MPO-13**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25, Prac-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

#### UNIT I

- I. Pain management
- II. Back School
- III. Butler mobilization of nerves
- IV. Manual Therapy: Introduction, History, Basic Classification, Assessment for manipulation, discussion in brief about the concepts of mobilization like:
  - i. Cyriax,
  - ii. Maitland
  - iii. Mulligan
  - iv. Kalterborne
  - v. Mckenzie
  - vi. Combined movement therapy
  - vii. Trigger point therapy
  - viii. Group exercises
  - ix. Taping: Principles of taping and application – rigid and dynamic taping
  - x. The concept of mobilization: Mennel
  - xi Segmental stabilization concepts of spine: muscle function in spinal stabilization, contribution of various muscles to spinal stabilization, local muscle dysfunction in low back pain, principles of clinical management of deep muscle system for segmental stabilization.

## **UNIT II**

- Principles of soft tissue mobilizations: Myofascial Release: Concept & brief discussion of its application technique, Muscle Energy Techniques, Positional release technique, neural tissue mobilization, INIT.
- Principles and application of neuromuscular facilitation techniques including PNF.
- Massage: Historical development, Definition and classification of massage techniques, Physiological effects of massage, Description of the techniques of the connective tissue massage, Physiological basis of massage, underwater massage, mechanical devices of massage, Therapeutic applications and contraindications of massage.
- Aquatic therapy.

## **Unit III**

### **Anthropometry**

- Role of anthropometric knowledge in physiotherapy, age determination: skeletal age, dental age.
- Body measurements- gross size and mass, lengths or heights of body parts, circumferences of body parts, skinfold thickness.
- Anthropometric study group measurements- planes of the body, axes of the body, landmarks on the body.
- Body composition- different body compositions, various methods to estimate body composition- anthropometric determination of the body composition(skinfold thickness), application of surface anthropometry (the body profile)
- Somatotyping- Sheldon's method of somatotyping- critical evaluation of method of somatotyping, Heath- Carter method of somatotyping- the rating scales, anthropometric measurements, first, second and third components, somatotype distribution.

## **BOOKS RECOMMENDED**

1. Leon chaitow , Muscle Energy Technique,Churchill Livingstone.
2. GD Maitland, Maitland's vertebral Manipulation, Butterworth Heinemann.
3. James Cyriax, Textbook of Orthopaedic Medicine AITBS Publishers.
4. GD Maitland, Peripheral Manipulation, Butterworth Heinemann.
5. Leon chaitow , Position Release Technique,Churchill Livingstone.
6. Brain Mulligan, Manual Therapy,

7. Butler Butler Neural mobilization
8. A.G. Sinha, Principles and Practices of therapeutic Massage. Jaypee.
9. Andrea Bates and Norm Hanson: Aquatic Exercise Therapy, W.B. Saunders
10. Ostym, Beunen and Simons: Kinanthropometry II, University Park Press, Baltimore, 1998.
11. James A.P. Day : Perspectives In Kinanthropometry, Human Kinetics Publishers, Inc. Champaign, Illinois, 1998.
12. Koley S., Textbook of Anthropometry, AITBS
13. Singh and Malhotra: Kinanthropometry, Lunar Publications, 3rd ed
14. Verma and Mokha: Nutrition, Exercise and Weight Reduction, Exercise Science Publication Society, 3rd Ed.



**MASTER OF PHYSIOTHERAPY (ORTHOPEDECS) SEMESTER IV**

**Dissertation-II**

**Paper: MPO-14**

**M. Marks: 200**

**Practical: 150**

**Internal Assessment: 50**

1. The candidate shall prepare 4 hard copies of the dissertation and submit the same to the department office on or before the last working day of this semester.
2. Power point presentation of the complete research work.

**MASTER OF PHYSIOTHERAPY (ORTHOPEDECS) SEMESTER IV**

**Practical**

**Paper: MPO-15**

**M. Marks: 200**

**Practical: 150**

**Internal Assessment: 50**

The students will be undergoing a viva-voce related to the entire semester subjects and dissertation.

## **MASTER OF PHYSIOTHERAPY (ORTHOPEDECS) SEMESTER IV**

### **Clinicals/Journal Club – IV**

**Paper: MPO-16**

**M. Marks: 100**

**Practical: 75**

**Internal Assessment: 25**

#### **Section I: Case Presentation**

The students will have to present at least two mandatory case studies and two research studies in power point presentation form.

#### **Section II: Clinical Posting**

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of case studies assessed by them during the semester in a logbook.

## **BOOKS RECOMMENDED:**

1. Gray's Anatomy- Williams & Warwick – Churchill Livingston
2. Joint structure and function- a comprehensive book -Cynthia norkins
3. Clinical Anatomy for Medical Students- Snell's -Lippincott.
4. Text Book of Medical Physiology- Guyton – Mosby.
5. Pathologic Basis of Diseases- Robbins, Kotran and Kumar – W.B Saunders
6. Pharmacology and Pharmacotherapeutics, R.S Satoskar- Popular Publications, Bomby.
7. Pharmacology- Praseem K. Das - Churchill Livingstone.
8. Essential of Medical Pharmacology – K.D Tripathi - Jaypee Brothers.
9. General Pathology- Walter & Israel – Churchill Livingstone.
10. Muirs Textbook of Pathology, Anderson- Edwards Arnold Ltd.
11. Textbook of Pathology- Harsh Mohan- Jaypee Brothers.
12. Pathology: Implications for Physical Therapists – Goodmann and Boissonnault – W.E Saunders.
13. Essential of Medical Microbiology – Bhatia &Lal – Jaypee Brothers.
14. Microbiology & Introduction for the Health Sciences - Ackerman and Richards – W.B. Saunders Co.
15. Essentials of Exercise Physiology: McArdle, WD, Katch, FI, and Katch, VL. 2nd edn, Lippincott Williams and Wilkins (2000).
16. Fundamentals of Exercise Physiology: For fitness Performances and Health, Robergs RA, and Roberts, S.O McGraw Hill (2000).
17. Exercise Physiology: Powers, SK and Howley ET. 4th edn; McGraw Hill (2001)
18. Physiology of Sport and Exercise: Wilmore, JH and Costil, DL. Human Kinetics (1994)
19. Exercise Physiology- Human Bioenergetics and its Application: Brooks, GA, Fahey, TD, White, TP. Mayfield Publishing Company (1996)
20. McArdle, WD, Katch, FI &Katch, VL (2001) Exercise Physiology. 5th ed. Lippincott, Williams & Wilkins.
21. Text Book of Medical Biochemistry- MN Chatterjea- RanaShinde- Japye.
22. Johan Low & Reed: Electro therapy Explained, Butterworth.
23. Joseph Kahn: Principles and practice of Electrotherapy, Churchill Livingstone.
24. Claytons Electrotherapy 10th Ed. – Sarah &Bazin- W.B Saunders.

25. Therapeutic Exercise, Basmajian, Williams & Wilkins.
26. Therapeutic Exercise Foundation & Techniques, Kisner Colby, Jaypee.
27. A.G. Sinha, Principles and Practices of therapeutic Massage. Jaypee.
28. Orthotics and Prosthetics in Rehabilitation, 2e Lusardi, Elsevier.
29. Orthotics in Functional Rehabilitation of the Lower Limb. Nawoczenski, Elsevier.
30. Gardiner M. Dena: The Principles of Exercise Therapy - CBS Publishers, Delhi.
31. Woods & Baker: Beard's Massage, W.B Saunders.
32. Kendall: Muscles – Testing and Function – Williams & Wilkins.
33. Daniels and Worthingams: Muscle Testing – Techniques of Manual. , W.B Saunders.
34. Norkin & White: Measurement of Joint Motion – A Guide to Goniometry.
35. Luttgens K. Hamilton N.: Kinesiology – Scientific Basis of Human Motion 9th Ed, 1997, Brown & Benchmark.
36. White and Punjabi – Biomechanics of Spine - Lippincott.
37. Basmajian – Muscle alive- Williams & Wilkins.
38. Muscle Energy Technique, Leon Chaitow, Churchill Livingstone.
39. Maitland's vertebral Manipulation, GD Maitland, Butterworth Heinemann.
40. Cyriax's Illustrated Manual of Orthopaedic Medicine, JH Cyriax, Butterworth.
41. Position Release Technique, Leon Chaitow, Churchill Livingstone.
42. Manual Therapy, Brain Mulligan.
43. Butler Neural mobilization, Butler.
44. Kapandji: Physiology of Joints Vol. I, II, & III, W.B Saunders.
45. Methods in Biostatistics – Mahajan- J.P.
46. Research for Physiotherapist: Project Design and Analysis - Hicks Churchill Livingstone.
47. Biostatics: The manual for Statistical methods for use in health and nutrition – K.V. Rao – J.P.
48. Turek's Orthopaedics: Principles and their Application , Weinstein SL and Buckwalter JA, Lippincott
49. Apley's System of Orthopaedics and Fractures, Louis Solomon, Arnold publishers.
50. Textbook of Orthopaedics, Adams: Churchill Livingstone
51. Clinical Orthopaedic Rehabilitation, Brent Brotzman.

52. Orthopaedic Physiotherapy, Robert A Donatelli, Churchill Livingstone.
53. Tidy's Physiotherapy, Ann Thomasons, Varghese publishing House.
54. Physical Rehabilitation Assessment and Treatment, Susan Sullivan, Japee brothers
55. Textbook of Orthopaedics, John Ebnezar, Japee Brothers.
56. Pain Series Rene Calliet., Japee Brothers.
57. Physical therapy of shoulder, Robert A Donatelli, Churchill Livingston
58. Geriatric physiotherapy Guccione AA, Mosby.
59. Hand practice, Principle and Practice, Mauren Salter, Butterworth Heinemann.
60. Essentials of Orthopaedics and Applied Physiotherapy ,JayantJoshi,prakashKotwal; Churchill Livingstone
61. Principle and Practice of Orthopaedics Sports Medicine, William E Garrett, Lippincott William and Wilkins.
62. Orthopaedic Physiotherapy, Robert A Donatelli, Churchill Livingstone.
63. Physical Rehabilitation Assessment and Treatment, Susan Sullivan, Jaypee brothers
64. Manual Examination and Treatment of the Spine and Extremities, Carolyn Wadsworth, Williams and Wilkins.
65. Illustrated Orthopaedic physical Assessment, Ronald C Evans, Mosby.
66. Physical Examination of the Spine and Extrimities, Stenley, Lipenfield.
67. Clinical Orthopaedic Examination, Mc Rae, Churchill Livingstone.

**MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY, ORTHOPEDICS &  
NEUROLOGY) SEMESTER I**

**Research Methodology & Biostatistics**

**Paper: MPT-01**

**Time: 3 hrs**

**Max Marks: 100**

**Theory: 75**

**Internal Assessment: 25**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

**Description:**

**Research in physiotherapy:** Introduction, Need for Research in Physical Therapy, Research Definition, Concepts, Purpose and Significance, Types of Research, Ethical issues in Research.

**Research Design:** Meaning, Need, Features and Various concepts relating to research design, Types of research design, research Approaches: Quantitative and Qualitative- assumptions and problems, Experimental design: Basic principles of experimental research designs, single system and group or Multiple factor design- Problems, Characteristics and limitations, Non Experimental design: Survey research-Scope, types & Implementation. Clinical case reports, Qualitative Research designs & methods

**Research Process:** Research problems, Questions and Hypothesis, Various steps involved in Research process, criteria of good research and problems encountered by researchers.

**Measurement of Scaling techniques:** Measurement in Research- Definition, Various Scales, Errors in Measurement and Scaling Technique, Reliability and validity in research.

**Methods of Data Collection:** Types of Data sources- Primary and secondary. Collection of Primary data (Observation and Oral Interview method, Questionnaire, Schedules); Collection of secondary data (published and unpublished sources)

**Statistical Reasoning, Processing & Analysis:** Introduction to Data set, Frequency Distribution, Central tendency, Variability in Distribution, Measures of Asymmetry (Skewness), Measures of Relationship, Correlation-Simple, Partial and Multiple. Regression - Simple and Multiple.

**Sampling Fundamentals:** Basic concepts, Need of sampling, Sample design- Steps in Sample Design, Characteristics of Good Sample Design, Types of Sampling.

**Sampling Theory:** Principles of Sampling, Sampling and Non Sampling Errors, Theory of Estimation, Sampling Distributions, Central limit theorem, Sample size & its determination.

**Measures of Central Tendency and Dispersion-** Arithmetic mean, median, mode and standard deviation (application).

**Correlation and Regression:** Karl Pearson's correlation method, Rank correlation method, Regression Equation and their coefficients (numerical)

**Hypothesis Testing:** Null Hypothesis, Alternative Hypothesis, Acceptance and Rejection Region, Level of Significance, Type I & II errors, Hypothesis Testing for Means, Sample Proportions and Variances, Chi-Square Test for comparing variances, Conditions and steps involved in applying Chi-Square Test, Analysis of Variance (ANOVA)- Basic Principles Techniques, Coding Method, Two way ANOVA and Analysis of Covariance (ANCOVA); Importance and characteristics of Non Parametric or Distribution- Free Tests.

**Parametric and Non-Parametric Tests (Simple Applications):** Z-test, t-test, F-test, chi-square test, ANOVA (One way and two way), ANCOVA, Spearman's rank Correlation and Kendall's Coefficient of Concordance.

**Multivariate Analysis Techniques:** Characteristics, Classifications and Variables in Multivariate Analysis, Techniques of Factor Analysis.

**Writing an Research Proposal, Critiquing a Research Article:** Defining a problem, Locating the Literature, Types of Literature, Evaluating Literature- Evaluating Single Studies and Review Articles, Elements of Research article- Inclusion and Exclusion Criteria, Funding, Data Collection & Analysis, Results, Interpretation, Conclusion, Discussions.

**Interpretation and Report writing:** Meaning, Techniques, Precautions, Significance, Steps and Types

**Publication and Presentation of Research**

### **BOOKS RECOMMENDED:**

1. Cooper D.R and Schindler, P.S., Business Research Method, Tata McGraw Hill Publishing Co.
2. Carolyn. M.Hicks, Research for Physiotherapists, Project Design and Analysis, Elsevier Health Sciences, Second Edition.
3. C.R Kothari. Research Methodology-Methods and Techniques, New age International Limited, Publishers, Second Edition.



# MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER I

## Basic Medical Sciences

**Paper: MPN-01**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25; Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

### **Description:**

#### **Unit I**

##### **NEURO ANATOMY**

- Knowledge of Central Nervous system.
- Nerve plexus of the body with their distributions (Cervical Plexus, Brachial plexus, Lumbosacral plexus).
- Revision of brain, meninges, and spinal cord, Outline of Ventricles, Brain stem
- Introduction to Head & Neck.
- Revision of blood supply to the brain and spinal cord and development of nervous system

#### **Unit II**

##### **NEURO PHYSIOLOGY**

1. Neuron and Neuroglia
2. Peripheral nerves
3. Spinal cord
4. Medulla
5. Pons
6. Midbrain
7. Cerebellum
8. Basal ganglia
9. Higher Intellectual Functions

10. Cranial Nerves
11. Cerebrum
12. Reticular and Limbic system
13. Autonomic nervous system
14. Ventricular system
15. Special senses
16. Physiology of Pain
17. Neuroplasticity
18. Cerebrospinal Fluid

### **Unit III**

Joints mechanics and gait: Biomechanics of spinal motion.(in brief), Biomechanics of upper and lower limbs (In brief), Gait parameters, Kinetics, Kinematics, Time- Space, Gait analysis, Control of normal mobility, Essential requirements for successful locomotion, Control Mechanisms for gait, Initiating gait and changing speeds, Mobility Other than gait. A life span Perspective of Mobility, Development of Locomotion, Locomotion in the older adult, Abnormal Mobility, Abnormal Gait, disorders of mobility other than Gait, pathological gait, Running, Stair Climbing, Changes in gait following, various neurological disorders.

### **Unit IV**

#### **PHARMACOLOGY**

General Pharmacological Principles: Routes of Drug Administration, Pharmacokinetics, Pharmacodynamics, Adverse drug reactions and drug interactions. Systemic pharmacology: Drugs acting on Autonomic Nervous System, Drugs acting on Peripheral (Somatic) Nervous System, Drugs acting on Central Nervous System, Steroids, Muscle Relaxants, Drugs to reduce spasticity, Diuretics.

#### **BOOKS RECOMMENDED:**

1. Gray's Anatomy-Williams & Warwick- Churchill Livingstone
2. Clinical Anatomy for Medical Students - Snell's- Lippincott.
3. Text Book of Medical Physiology- Guyton - Mosby.
4. Pharmacology and Pharmacotherapeutics, R. S. Satoskar - Popular Publications, Bombay.
5. Luttgens K., Hamilton N., Kinesiology: Scientific Basis of Human Motion 9th Edi, Brown & Benchmark.
6. Kapandji, the Physiology of the Joints, Vol. I, II & III, W.B. Saunders.

# MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER I

## Physical and Functional Evaluation of Neurological Disorders

**Paper: MPN-02**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25; Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

### **Description:**

#### **Unit I**

Importance of assessment & evaluation, Methods of evaluation — Interview, Clinical examination in general and detection of movement dysfunction, Clinical assessment and investigations along with differential diagnosis, Specific tests and scales related to neurological disorders, Neurological screening, Perception testing and training.

#### **Unit II**

Motor control assessment, Reflexes and automatic reactions, voluntary control, Feedback mechanisms, Evaluation of motor system- MMT, Evaluating facial motor function in patients with peripheral and central lesions, Evaluating motor function in trunk and limbs of patients with a peripheral nerve lesion, Evaluating motor function in disorders of the central nervous system.

Evaluation of somatosensory sensation, Cognitive and perceptual evaluation, Assessment of cranial nerves, Aids and appliances, Adaptive functional devices to improve neurological dysfunction, Physical disability evaluation and disability diagnosis, Assessment of higher functions.

#### **Unit III**

Assessment of upper limb complex (In relation to neurological disorders): shoulder girdle, Shoulder, Arm, Elbow, Forearm, Wrist and hand. Assessment of lower limb complex (In relation to neurological disorders): Pelvis, Hip, Thigh, Knee, Leg, Ankle and foot. Assessment of spinal column: Cervical, Thoracic and lumbosacral.

## **Unit IV**

Assessment of balance and coordination: Gait analysis and diagnosis, Assessment of gait deviations. Neurodevelopment assessment and motor learning- voluntary control assessment, neuro- psychological tests, Neuro dynamic tests. (Slump, SLR, ULTT).  
Electrodiagnosis- EMG, NCV, H-reflex, F-wave

## **Unit V**

Radiology: Basics of radiology including X- Ray, Doppler ultrasound, CT and MRI scanning, Biopsy report reading and analysis. Imaging of the Head and Neck, Imaging of Spine, Imaging of Pelvis, Hip and Thigh, Imaging of Patello Femoral Joint and Knee Joint, Imaging of the Lower leg, Foot and Ankle, Imaging of Shoulder girdle, Shoulder, and Arm. Imaging of Elbow, Forearm and Hand, Lumbar puncture, Imaging with dye.

### **BOOKS RECOMMENDED:**

1. Geriant Fuller, Neurological Examination Made Easy, Churchill Livingstone.
2. David J. Magee, Orthopaedic Physical Assessment, W.B. Saunders Company.
3. M. Lacote, Clinical Evaluation of Muscle Function, Churchill Livingstone.
4. Susan Sullivan, Physical Rehabilitation, Jaypee Brothers
5. Sutton D, Text Book of Radiology, Churchill Livingstone.

## **MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER I**

### **Clinicals/Journal Club-I**

**Paper: MPN-03**

**M. Marks: 100**

**Practical: 75**

**Internal Assessment: 25**

### **Section I: Case Presentation**

The students will have to present at least two case studies and two research studies in power point presentation form.

### **Section II: Clinical Posting**

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of the case studies assessed by them during the semester in a logbook.

**MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY, ORTHOPEDICS &  
NEUROLOGY) SEMESTER II**

**Skill Enhancing Studies**

**Paper: MPT-02**

**Time: 3 hrs**

**Max Marks: 100**

**Theory: 75**

**Internal Assessment: 25**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

**Description:**

**Unit I**

**Management and Ethics in Physiotherapy**

- Health care delivery system,
- Ownership and private practice in physiotherapy
- Organizing and engaging people in work setting
- Health care financial, planning and risk management
- Marketing and Information management
- History and Development, Professional conduct in Physiotherapy
- Standards of practice in Physiotherapy
- Morals and ethics
- Code of ethics, social and medical policy in health care
- Professional liability and obligation
- Legal responsibility and medico-legal action

## **Unit II**

### **Educational Technology**

- Educational aims, trends and issues
- Formal and informal education
- Philosophies of education – Naturalism, professionalism, idealism, realism
- Contemporary and modern philosophies of education
- Agencies of education
- Relationship between teaching and learning
- Theories of teaching
- Motivational process of learning perception, individual differences, intelligence personality
- Planning of teaching, strategies of teaching, organization, writing lesson plan
- Teaching methods
- A-V aids
- Programme evaluation, cumulative evaluation
- Nature of measurement of education, meaning, process, personnel, standardized, non-standardized
- Standardized tools, important tests of intelligence, aptitude, personality, instrument, achievements and status scale.

### **BOOKS RECOMMENDED:**

1. M. Ashraf Rizvi, Effective Technical Communication, Tata McGraw Hill Pbl.
2. Krishna Mohan and Meena Banerji, Communication Skills, Macmillan Pbl.
3. J M Synge, Riders to the Sea.
4. Bhushan Anand, Educational Technology, Bawa Publications, 2006.
5. Dr. Mangal S.K, Educational Technology, Tandon Publications, 2006
6. Sharma R.A, Essentials of E.T, Lyall Book Depot, 2004
7. Sharma R.A, Technology of teaching, Lyall Book Depot, 2004.
8. Elligworth, Educational Technology, Peerson, 2006.

**MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY, ORTHOPEDICS &  
NEUROLOGY) SEMESTER II**

**Exercise Physiology and Nutrition**

**Paper: MPT-03**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25; Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

- Energy sources- Carbohydrates, Proteins, Fats, Minerals and Vitamins. Metabolism of Carbohydrates, fats and proteins
- Energy balance, Regulation of calorie Intake and Ideal Body weight, Pre-competition meal, fluid and energy replacement in prolonged exercise.
- Obesity–Body composition and assessment, Various diets to reduce Obesity and other exercise regimes - ACSM guidelines
- Aerobic process- Intensity, duration of Exercises and Calculation of VO<sub>2</sub> Max and its variability, How to estimate Aerobic Capacity
- Anaerobic process- Lactate Production, OBLA and Estimation of Anaerobic capacity, Oxygen Debt.
- Training Principles- Biological and Long term adaptations to training, Retraining recovery after exercise, Detraining, Overtraining
- Continuous training, Interval training, Endurance Training, Fartlek training, Plyometrics, Resistance training, Ballistic Stretching, Isokinetic training. Contraindications to physical training.



- Fatigue-Definition, types, causes and prevention. DOMS and its prevention. Deconditioning.
- Applied Work Physiology–MET, Classification of Exercise intensity based on MET. VO<sub>2</sub> max. Blood lactate and other parameters, factors affecting sustained physical work. Assessment of workload in relation to work capacity.
- Basal metabolic and resting metabolic rates and factors affecting them.
- Classification of physical activities based on energy expenditure. Daily rates of average energy expenditure. Energy expenditure at rest and during various physical activities e.g. sleeping, sedentary work, household work, walking, jogging, running and swimming.
- Measurement of energy cost of exercise–direct calorimetry, indirect calorimetry, net oxygen cost of aerobic and anaerobic exercise, MET, body size and energy cost.
- Factors Affecting Performance- High Altitude- Physiological changes and adaptations in high altitudes, high altitude disorders. Deep sea diving and Breath hold diving, Physiological changes and adaptations in deep sea diving, SCUBA, Consequences of Deep sea diving- Nitrogen bends, Oxygen Poisoning, CO poisoning and Hyperbaric oxygen therapy, Doping- Ergogenic and Ergolytic IOC banned substances. Tobacco smoking - circulatory effects, respiratory effects, metabolic effects, smoking habits among athletes. Caffeine, alcohol & Exercise.
- Cardiovascular system and exercise
  - Athletes heart, cardiovascular adaptations to sustained aerobic exercises
  - Lipids and sports, protection from coronary heart disease, exercise and optimization of lipid profile.
  - Sudden cardiac death in sports
  - Regulation of circulations during exercise
- Exercise and Respiratory system
  - Athlete's lungs
  - Regulation of respiration during exercise

- Endocrine system responses to exercise: effects of exercise on various hormones in the body, hormone regulation of fluid and electrolytes during exercise, exercise & menstrual cycle.

**BOOKS RECOMMENDED:**

1. William D. McArdle , Frank I.Katch, Victor L. Katch Exercise Physiology – Energy Nutrition and Human Performance Sixth Edition.
2. LippinCott Williams and Wilkins.
3. Exercise Physiology and Nutrition Jack H.Wilmore 3<sup>rd</sup> edition Churchill Livingstone.

## MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER II

### Medical and Surgical Aspects of Neurological Conditions

**Paper: MPN-04**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25; Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

#### Unit I

Stupor and Coma: The neural basis of consciousness, Lesions responsible for stupor and coma, Traumatic Brain Injury, Diffuse axonal Neuropathy, The assessment and investigation of the unconscious patient, The management of the unconscious patient, Total rehabilitation protocol; Cranial Nerves: Testing of cranial nerves, Disorders of cranial nerves, Cranial neuropathy, Rehabilitation protocol, Speech Disorders.

#### Unit II

Disorders of Cerebral circulation: Epidemiology of stroke; Causes, Types, Pathophysiology, Clinical features and investigation, Treatment of different types of stroke, Recovery and rehabilitation, Stroke prevention, Infectious disorders: Meningitis, Encephalitis, Brain abscess, Syphilis, Herpes simplex, Tuberculosis, Transverse myelitis, Poliomyelitis, LGBS, Tabes Dorsalis; Myasthenia Gravis, AIDS: Classification, Causes, Pathophysiology, Clinical features, Complications and management.

#### Unit III

Demyelinating diseases of the nervous system: Classification of demyelinating diseases; Multiple sclerosis, Diffuse sclerosis, Motor Neuron Disorders, Extra Pyramidal Syndromes: Akinetic-rigidity syndrome disorders, Parkinson's disease, Dyskinesia disorders, Chorea, Athetosis, Hemiballismus etc., Cerebellar Disorders: Different types of Ataxia, Miners' disease

#### **Unit IV**

Degenerative diseases of the spinal cord, Disorders/ Rehabilitation of the spinal cord and cauda equina: Acute traumatic injuries of the spinal cord, Haematomyelia and acute cervical cord injuries, Slow progressive compression of the- spinal cord, Syringomyelia, Ischaemia and infarction of the spinal cord and cauda equine, Disorders of higher cerebral cortical function: Disorders of different lobes-Frontal, Temporal, Parietal, Occipital, Sub cortical lesions, Cognitive and Perceptual Disorders and auto immune diseases.

#### **Unit V**

Disorders of peripheral nerves: Clinical diagnosis of peripheral neuropathy, All types of peripheral neuropathies and brachial plexus lesions, Causalgia, Reflex sympathetic dystrophy, Peripheral nerve tumours, Irradiation neuropathy; Traumatic, Compressive and ischaemic neuropathy; spinal radiculitis and radiculopathy, Hereditary motor and sensory neuropathy, Acute idiopathic polyneuritis, Neuropathy due to infections, Vasculomotor neuropathy, Neuropathy due to Systemic Medical Disorders, Drug induced neuropathy, Metal poisoning, Chemical neuropathies and chronic fatigue syndrome.

#### **Unit VI**

Disorders of muscles: Muscular dystrophies of adulthood, Thymotonic disorders, Inflammatory disorders of muscle, Myasthenia gravis, Endocrine and metabolic myopathies, Duchenne muscular dystrophy, Progressive muscular dystrophy

#### **Unit VII**

Disorders of Autonomic nervous system: Disorders of autonomic function after lesions of spinal cord, Epilepsy, Geriatric neurological disorders, Metabolic disorders of brain: Hypoxic encephalopathy, Hypoglycaemic encephalopathy, Hepatic encephalopathy.

#### **Unit VIII**

Falls in elderly, Age associated memory impairment, Alzheimers Disease, Dementia, Narcolepsy.

## **BOOKS RECOMMENDED:**

1. Lord Walter Russell Brain, John Nichol, Walton, Brains Diseases of the Nervous System, Oxford University Press, 1993.
2. Cecily (ed.) Partridge, Neurological Physiotherapy: bases of evidence for practice: treatment and management of patients, Whurr Puhl, 2002
3. Simon J. Ellis, Clinical Neurology: Essential Concepts, Elsevier Health Sciences, 1998.
4. Richard Greenwood, Neurological Rehabilitation, Psychology Press, 1997.
5. Michael P. Barnes, Garth R. Johnson, Upper Motor Neuron Syndrome and Spasticity: Clinical Management and Neurophysiology, Cambridge University Press, 2001
6. Susan Edwards, Neurological Physiotherapy: A Problem-Solving Approach, , Elsevier Health Sciences, 2001.

## **MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER II**

### **Clinicals/Journal Club – II**

**Paper: MPN-05**

**M. Marks: 100**

**Practical: 75**

**Internal Assessment: 25**

#### **Section I: Case Presentation**

The students will have to present at least two case studies and two research studies in power point presentation form.

#### **Section II: Clinical Posting**

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of case studies assessed by them during the semester in a logbook.

## MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER III

### Basic Physiotherapeutics for Neurological Disorder

**Paper: MPN-06**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25; Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

#### **Unit I**

Rehabilitation and therapeutic exercises: Treatment planning process, Classification of treatment techniques based on Primary Input Systems, Psychosocial accommodation during various phases of Neurological Disability, Clinical management of the patient with a Mobility Disorder, Clinical management of the patient with a Postural Control Disorder.

#### **Unit II**

**Review of Basic Techniques:** Stretching (principles and methods), Balance and coordination exercises. Factors affecting the joint range of motion prevention of stiffness, methods of Joint mobilization. Postural Re-education (methods and techniques)

**Principle of therapeutic exercises:** Definition, details of effects and uses of following exercises:

- a. Dynamic Exercises
- b. Plyometric Exercises
- c. Isokinetic Exercises
- e. Kinetic chain exercises
- f. PRE

Therapeutic Biofeedback and psychosomatic training, Massage: Historical development, Definition and classification of massage techniques, Physiological effects of massage, Description of the techniques of the classical massage, Role of massage in various neurological disorders, Management of pain in neurological disorders.

## Neuromuscular Training

- i. Methods For Optimizing Neuromuscular & Postural Control : Proprioception Training And Kinesthetic Training (Sensory Integration),
- ii. Problem Solving Approach,
- iii. Motor Control
- iv. Clinical Decision Making And Clinical Reasoning, Evidence Based Practice

## Unit III

Modalities: Principles underlying the application of following modalities with reference to their case study and case presentation, evidence base practice, biophysical and therapeutic effects, indications and contraindications and the specific uses, especially in various neurological disorders - Low Frequency Current (Direct Current, Modified Direct Current, Alternative Current, Diadynamic Current, Iontophoresis, TENS, Galvanic Stimulation), Medium Frequency Current (IFT, Russian Currents). Laser therapy, Functional electrical stimulation, combination therapy and recent advancement in electrotherapy. Electrical stimulation and Electromyographic Biofeedback — Applications for neurological dysfunction

## Unit IV

Fluidotherapy: Physiological effects, Use of cold therapy in acute phase, Rehabilitative phase, and various neurological disorders, Methods of application, Indications and Contraindications.

History & introduction, Effects of simple baths, raising temperature baths, baths with additives, Aromatic baths, Mineral baths, physical baths, Hydroelectric baths, whirl pool bath, showers and steam showers.

Intermittent compression therapy: Principle, biophysical effects, types, therapeutic effects, indications, contraindications, precautions, operational skills and patient preparation of intermittent compression therapy. Principles of traction, physiological & therapeutic effects classification, types, indications, contraindications, techniques of application, operational skills & precautions. Extra corporeal shock wave therapy, light therapy and magneto-therapy.

## Unit V

- I. **Principles of Orthotics**- types, indications, contra indications, assessment (check out), uses and fitting –region wise.
  - i. Orthotics for the Upper Limb
  - ii. Orthotics for the Lower Limb
  - iii. Orthotics for the Spine
- II. **Principles of prostheses**- types, indications, contra indications, assessment (check out), uses and fitting –region wise.



**BOOKS RECOMMENDED:**

1. Low & Reed, Electrotherapy Explained: Principles & Practice, Butterworth Heineman
2. Basmajian, Therapeutic Exercises, Williams and Wilkins.
3. Cook & Wallcott, Motor Control: Theory and Practical Applications, Lippincott.
4. Kendall, Muscle testing and functions, Williams & Wilkins.
5. Trombley, Occupational therapy.
6. Voss et al, Proprioceptive Neuromuscular Facilitation, Williams and Wilkins.
7. William E. Prentice, Rehabilitation Techniques, Mosby.

## MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER III

### Neurosurgical Rehabilitation

**Paper: MPN- 07**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25; Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

#### **Description:**

##### **Unit I**

Cranio-cerebral (head and brain) Surgery: Epidemiology, Pathophysiology, Symptoms, Signs, Investigations, Management, Post-operative physiotherapy, Complications of closed skull fractures, Haematomas-Epidural, Subdural, Intracerebral, Open cranio-cerebral injuries, Reconstruction operation in head injuries, Introduction to neurological ICU.

##### **Unit II**

Tumours: Pathophysiology, Classification, Effects of mass lesion, Symptoms and signs, Examination, Management, Pre and post-operative rehabilitation protocol of tumours of cranial bones, Meningioma, Tumours in spinal cord, Intracranial tumours, and peripheral tumours.

##### **Unit III**

Other conditions related to raised intracranial pressure: Hydrocephalus, Intracranial abscess, Central oedema, Vascular diseases of the brain: Aneurysms.  
Surgeries in Cerebral palsy.

##### **Unit IV**

1. Introduction to spinal Injuries- various types, levels, effects.
  - Acute lesion characteristics. type and level
  - Respiratory therapy
  - Initial physical re education

- Training for personal independence, self care, transfers
  - Wheelchair- principles for design, types, management and modifications.
  - Complications of high lesion and Incomplete spinal lesions
  - Orthotic support systems
2. Decompression surgeries of Spinal cord: Disc operation (cervical, lumbar), Stenosis, Oedema, Abscess, Lumbar puncture,
  3. Peripheral nerves: Decompression, Nerve suture, Nerve grafting, Tendon transfers.

## **Unit V**

- I. An outline of principles and methods of rehabilitation of speech and hearing disability
- II. An outline of principles and methods of vocational and social rehabilitation
- III. An outline of principles and methods of rehabilitation of mentally handicapped
- IV. An outline of principles , methods and scope occupational therapy
- V. Architectural Barriers: Describe architectural barriers and possible modifications with reference to, CVA, Spinal Cord Injury and other disabling conditions.
- VI. An outline of the principles and process of disability evaluation and Legal Aspect in Disabilities
- VII. WCPT Guidelines for rehabilitation

## **BOOKS RECOMMENDED:**

1. Kenneth W. Lindsay, Ian Bone, Neurology and Neurosurgery Illustrated, Churchill Livingstone, 2004.
2. Michael E. Selzer, Textbook of Neural Repair and Rehabilitation: Medical Neurorehabilitation, Cambridge University Press, 2006.
3. Andrew Kaye, Essential Neurosurgery (Essential), Blackwell Publishers, 2005.
4. Brian T. Ahndrews, Intensive Care in Neurosurgery, Thieme, 2003.
5. Willem Adriaan Liebenberg, Reuben David Johnson, Neurosurgery for Basic Surgical Trainees, Hippocrates Books, 2004.
6. Danilo Jankovic, Regional Nerve Blocks: Textbook and Color Atlas - Page 3, Blackwell Publishing, 2001.
7. Walter G. Bradley, Robert M. Crowell; The Year Book Of Neurology and Neurosurgery, Chicago • Year Book Medical Publishers, 2006.

**MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER III**  
**Dissertation-I**

**Paper: MPN-08**

**M. Marks: 100**  
**Practical: 75**  
**Internal Assessment: 25**

1. The students have to prepare a research proposal of the research project to be undertaken.
2. Students have to submit the soft and hard copy of the research proposal.
3. Power point presentation of the research proposal for the ethical committee clearance.
4. Students have to complete the data collection by the end of this semester.
5. Power point presentation of the research work completed till the end of this semester.

**MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER III**  
**Practical**

**Paper: MPN- 09**

**M. Marks: 100**  
**Practical: 75**  
**Internal Assessment: 25**

**The students will be undergoing a viva-voce related to the entire semester subjects and dissertation covered till this semester.**

**MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER III**  
**Clinicals/Journal Club – III**

**Paper: MPN-10**

**M. Marks: 100**  
**Practical: 75**  
**Internal Assessment: 25**

**Section I: Case Presentation**

The students will have to present at least two case studies and two research studies in power point presentation form.

**Section II: Clinical Posting**

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of case studies assessed by them during the semester in a logbook.

# MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER IV

## Neurological Rehabilitation

**Paper: MPN- 11**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25; Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

### **Description:**

#### **Unit I**

Principles, techniques of application and protocol for following special techniques:

Motor control therapy, Modified CIMT, myofascial release, cranio-sacral therapy, MIME therapy, Mc Kenzie exercises, taping for neurological disorders, relaxation techniques.

Neuropsychological and developmental Treatment Approaches - (Rood Approach, Bobath Neurodevelopmental Approach, Brunnstrom's Approach, PNF Approach, Carr and Shepherd Approach). Task oriented approach

Inhibition and facilitation techniques, Muscle Energy Techniques (MET), Therapeutic psychosomatic training, Nerve mobilization, Butler, NDT, Vojta techniques.

#### **Unit II**

Neuromuscular control- methods for improving neuromuscular control, Vestibular rehabilitation, aquatic therapy, Gait rehabilitation, Yoga, Soft tissue manipulation, Neurodynamics, ADL training, Wheel chair activities, Bed mobility.

Pilates, Virtual reality, Mirror therapy, Trans-cranial electric and magnetic stimulation, and Peripheral magnetic stimulation.

#### **Unit III**

Rehabilitation of: Disorders of cranial nerves, cerebral circulation, infectious disorders, autoimmune disorders, demyelinating diseases of nervous system, motor neuron disorders, extra pyramidal lesions, cognitive and perceptual disorders, and cerebellar disorders.

## **Unit IV**

Degenerative diseases of spinal cord, disorders of higher cerebral cortical function, various peripheral neuropathies, chronic fatigue syndrome, disorders of muscles, disorders of Autonomic nervous system, metabolic disorders of brain, geriatric neurological disorders, and various psychological disorders.

### **BOOKS RECOMMENDED:**

1. Cook & Wallcott, Motor Control: Theory and Practical Applications Shumway, Lippincott.
2. Carr J, Shepherd R, Neurological Rehabilitation - optimizing motor performance, Butterworth Heinemann, Oxford, 1998.
3. Voss et al, Proprioceptive Neuromuscular Facilitation, Williams and Wilkins.



## MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER IV

### Physiotherapy in Pediatric Neurology

**Paper: MPN-12**

**Time: 3 hrs**

**Max Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25; Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

#### **Description:**

##### **Unit I**

General developmental sequence of normal child: Weight, height and circumferential measurements related to age in normal child & Developmental milestones and neonatal reflexes. Examination of neonate. High risk Infants risk factors, assessment, ICU, PICU and NICU Care and early intervention programmes.

##### **Unit II**

Nutrition and Immunization: Normal nutritional requirements of a child, Infant feeding, prevention of some nutritional disorders, nutritional deficiency diseases, immunization.

##### **Unit III**

Cerebral palsy: Types, etiology, clinical features, management and rehabilitation of various types of cerebral palsies.

##### **Unit IV**

Neurological affection of childhood: Poliomyelitis, Spina bifida, Hydrocephalus, Encephalitis-etiology, clinical features and rehabilitation. Birth injuries of brachial plexus, paraplegia in children.

##### **Unit V**

Muscular disorders: Types of muscular dystrophies and Myopathies of childhood, DMD, BMD etc.

## **Unit VI**

Motor control and Motor learning: Theories of Motor control and Motor learning, role of limbic system and Its Influence over Motor control and learning. Sensory Integration therapy. Behavioral therapy.

## **Unit VII**

Genetic disorders, congenital malformations, chromosomal disorders and learning disabilities relevant to specialty.

### **BOOKS RECOMMENDED:**

1. Piper Motor Assessment of the Developing Infant
2. Ratliffe Clinical Pediatric Physical Therapy, 2e
3. Shepherd Physiotherapy In Pediatrics, 3e

**MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER IV**

**Dissertation-II**

**Paper: MPN-13**

**M. Marks: 200**

**Practical: 150**

**Internal Assessment: 50**

1. The candidate shall prepare 4 hard and 3 soft (CDs) copies of the dissertation and submit the same to the department office on or before the last working day of this semester.
2. Power point presentation of the complete research work.

**MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER IV**

**Practical**

**Paper: MPN-14**

**M. Marks: 200**

**Practical: 150**

**Internal Assessment: 50**

The students will be undergoing a viva-voce related to the entire semester subjects and dissertation.

## **MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER IV**

### **Clinicals/Journal Club – IV**

**Paper: MPN-15**

**M. Marks: 100**

**Practical: 75**

**Internal Assessment: 25**

#### **Section I: Case Presentation**

The students will have to present at least two mandatory case studies and two journals in power point presentation form.

#### **Section II: Clinical Posting**

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of case studies assessed by them during the session in a logbook.

## **BOOKS RECOMMENDED:**

1. Gray's Anatomy-Williams & Warwick- Churchill Livingston
2. Clinical Anatomy for Medical Students - Snell's- Lippincott.
3. Text Book of Medical Physiology- Guyton - Mosby.
4. Pathologic Basis of Diseases - Robbins , Kotran and Kumar- W.B. Saunders
5. Rau Respiratory Care Pharmacology, 6e
6. Pharmacology and Pharmacotherapeutics, \_R.S.Satoskar - Popular Publications, Bombay.
7. Pharmacology - Praseem K. Oas. - Churchill Livingstone.
8. Essential of Medical Pharmacology- K. D. Tripathi- Jaypee Brothers.
9. General Pathology - Walter & Israel - Churchill Livingstone
10. Muirs Textbook of Pathology; Anderson - Edward Arnold Ltd.
11. Textbook of Pathology - Harsh Mohan- Jaypee Brothers.
12. Pathology: Implications for Physical Therapists - Goodmann and Boissonnault - W.E. Saunders
13. Essential of Medical Microbiology -Bhatia & Lal - Jaypee Brothers.
14. Microbiology & introduction for the Health Sciences - Ackerman and Richarc::ls - W.B. Saunders Co.
15. Text Book of Medical Biochemistry- MN Chatterjea- Rana Shinde- Jaypee
16. John Low & Reed: Electro therapy Explained ,Butterworth
17. Joseph Kahn: Principles and practice of Electrotherapy, Churchill Livingstone.
18. Claytons Electrotherapy 10th Ed. - Sarah & Bazin -W.B. Saunders.
19. TB of Therapeutic Exercises, Narayanan, Jaypee
20. Therapeutic Exercise, Basmajian, Williams & Wilkins
21. Therapeutic Exercise Foundation & Techniques, Kisner Colby, Jaypee.
22. A.G. Sinha, Principle and Practices of therapeutic Massage. Jaypee
23. Orthotics and Prosthetics In Rehabilitation, 2e Lusardi, Elsevier.
24. Orthotics In Functional Rehabilitation of the Lower Limb Nawoczenski, Elseivier

25. Gardiner M. Dena: The Principles of Exercise Therapy - CBS Publishers, Delhi.
26. Wood & Baker: Beard's Massage, W.B. Saunders.
27. Kendall: Muscles -Testing and Function -Williams & Wilkins
28. Daniels and Worthinghams: Muscle Testing -Techniques of Manual Examination, W.B. Saunders.
30. First Aid to Injured: St. John's Ambulance Association.
31. Norkin & White: Measurement of Joint Motion - A Guide to Goniometry
32. Luttgens K., Hamilton N.: Kinesiology- Scientific Basis of Human Motion, 1997, Brown & Benchmark.
33. White and Punjabi - Biomechanics of Spine - Lippincott.
34. Basmajian - Muscle alive -Williams & Wilkins
35. Muscle Energy Technique, Leon chaitow ,Churchill Livingstone.
36. Butler Neural mobilization , Butler
37. Campbell Rehabilitation for Traumatic Brain Injury: Physical Therapy Practice In Context
38. Carr Stroke Rehabilitation: Guidelines for Exercise and training to Optimize
39. Carr Neurological Rehabilitation: Optimizing Motor Performance, 2e
40. Cech Functional Movement Development Across the Life Span, 2e
41. Campbell Physical Therapy for Children, 3e
42. Edwards Neurological Physiotherapy: A Problem-Solving Approach, 2e
43. Lundy·Ekman Neuroscience: Fundamentals for Rehabilitation, 2e
44. Martin Neurologic Interventions for Physical Therapy, 2e
45. Petty Neuromusculoskeletal Examination and Assessment: A Handbook for Therapists, 3e
46. Piper Motor Assessment of the Developing Infant
47. Pope Severe and Complex Neurological Disability: Management of the Physical Condition
48. Ratliffe Clinical Pediatric Physical Therapy, 2e

49. Shacklock Clinical Neurodynamics: A New System of Neuromusculoskeletal Treatment
50. Shepherd Physiotherapy In Pediatrics, 3e
51. Stokes Physical Management in Neurological Rehabilitation, 2e
52. Umphred Neurological Rehabilitation, 5e
53. Von Craniofacial Pain: Neuromusculoskeletal Assessment, Treatment and Management
54. Dejong's, Neurological Examination
55. O.Sullivan, Susan B Physical rehabilitation: Assessment and Treatment, FA Davis Company
56. Berta bobath, Adult Hemiplegia: Evaluation & Treatment
57. Delisa, Physical Medicine and Rehabilitation. Walter R. Frontera
58. Brunnstrom's Movement Therapy in Hemiplegia: A Neurophysiological Approach .Kathryn A. Sawner
59. Clinical Neuroanatomy Richard S. Snell
60. Basic Biomechanics of the Musculoskeletal System by Margareta Nordin, Victor H. Frankel.
61. Occupational Therapy for Physical Dysfunction 7th Edition by Mary Vining Radomski, Catherine A. Trombly .
62. Braddom's Physical Medicine and Rehabilitation, 5e by David X. Cifu
63. Pilates Anatomy by Rael Isacowitz and Karen Clippinger.
64. A Practical Guide to Kinesiology Taping. John Gibbons



## ***BACHELOR OF PHYSIOTHERAPY (PART-I)***

### **Paper – I Anatomy**

**Time: 3 Hrs.**

**M. Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25; Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

### **Section-I**

#### **General Introduction:**

1. **Histology**-Cell, tissues of the body, epithelium, connective tissue, cartilage, bone, lymph, muscle, nerve etc.
2. **Osteology**-Formation, function, growth and repair of bones.
3. **General Embryology**-Ovum, spermatozoas, fertilization, differentiation, development of various systems and foetal circulation.

### **Section-II**

#### **Systems of Human body (a brief Outline):**

1. **Blood Vascular System** – Arteries, capillaries, veins, heart, lymphatic system.
2. **Respiratory System** – Anatomy of upper and lower respiratory tract including nose, larynx, trachea, bronchi, pleura and lungs.
3. **Digestive System** – Anatomy of the gastro-intestinal tract.
4. **Urogenital System** – Anatomy of Urinary system, male and female reproductive system.
5. **Endocrine System** – The various organs and production of hormones including definition, structures in general, control of secretions and role of hypothalamus.
6. **Integumentary System**
7. **Surface Anatomy**

### **Section-III**

#### **Neuro-anatomy: Microscopic and gross study of:-**

1. Peripheral Nerves
2. Neuromuscular Junction

3. Sensory End Organs
4. Spinal Cord Segments & Areas
5. Brainstem
6. Cerebellum
7. Inferior colliculi
8. Superior Colliculi
9. Diencephalon
10. Hypothalamus
11. Epithalamus
12. Thalamus
13. Cerebral hemispheres
14. Corpus striatum
15. Rhinencephalon
16. Lateral ventricles
17. Meninges
18. Bloody supply of the brain
19. Internal Capsule
20. Visual radiation
21. Auditory radiation
22. Thalamocortical radiations
23. Pyramidal systems
24. Extra-pyramidal systems
25. Sympathetic system
26. Para-sympathetic system
27. Crainal nerves

## **Section-IV**

### **Upper Extremity**

#### **Osteology**

- Outline the anatomical features, attachments, ossification and side determination of the bones of U/L : Clavicle, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges

#### **Myology**

- Fascia and Muscles of front and back of upper arm: origin, insertion, nerve supply and action.
- Muscles of front and back of forearm: origin, insertion, nerve supply and action.
- Mention the small muscles of hand with their origin, insertion, nerve supply and action.
- Identify the nerves of upper units and mention their position course, relations and distribution.

- Detail explanation of joints of upper limb: shoulder guide, Shoulder joint, Elbow, Wrist and joints of hand.
- Indicate the blood vessels of upper limb and mention their position course, relations, distribution and main branches.
- Lymphatic drainage of upper limb
- Applied anatomy of all structures of U/L

## **Section – V**

### **Regional Anatomy**

Detailed explanation of the following with their applied anatomy.

- Pectoral Region
- Scapular Region
- Cubital Fossa
- Axilla
- Insatiate formation of Brachial Plexus
- Spaces of the hand

## **Section – VI**

### **TRUNK-THORAX ABDOMEN**

#### **Osteology:**

- Vertebral columns: Identify the parts of typical vertebra and state the main features, attachments and ossification.
- Intervertebral disc and mention its part.
- Ribs: Parts and main features of typical rib and define true, false and floating ribs.
- Sternum: State the parts and anatomical features.

#### **Myology:**

- Fascia and muscles of back
- Fascia and muscles connecting U/L with vertebral column: origin, insertion, nerve supply, action.
- Intercostal muscles and diaphragm: origin, insertion, nerve supply and action.
- List layers of anterior abdominal wall and mention its origin, insertion, nerve supply and action of these muscles.
- Fascia and muscles of post abdomen. Wall: origin, insertion, nerve supply and action.

#### **Joints of Thorax**

Identify the various joints and explain in detail:

- Manubriosternal joint
- Costo vertebral joint
- Costo transverse joint

- Costo Chondral joint
- Chondro sternal joints
- Inter vertebral joint
- Movements of vertebral column
- Respiratory movements

□ Mention the course and branches and nerves, blood vessels and lymphatic drainage of trunk-thorax-abdomen.

- Lumbar Plexus: Position, formation and branches.
- Rectus sheath: formation and contents.
- Contents of vertebral canal
- Intercostal space and its contents
- Diaphragm-structures passing through it.
- Applied Anatomy of structures of trunk – thorax – abdomen

### **Section – VII**

## **PELVIS**

- Features of pubic symphysis and sacroiliac joints.
- Muscles of pubic floor and mention their attachments, action and nerve supply.
- Difference between male and female pelvis.
- Main features of subdivision, boundaries, walls and floor of pelvis.

□ Urogenital diaphragm (outlines only)

- Applied anatomy of plexus
- Lymphatic drainage
- Nerve supply
- Sacral Plexus
- Mention the blood vessels of the region with course, variations, distribution and main branches.

### **Section – VIII**

## **LOWER EXTREMITY**

□ **Osteology:**

- Hip bone, femur, Tibia, Fibula, Patella, and bones of the foot

□ **Myology:**

- Fascia and muscles in front of thigh: Origin, Insertion, Nerve Supply, Action
- Fascia and muscles of medial side of thigh: Origin, Insertion, Nerve Supply, Action
- Fascia and muscles of back of thigh

- Fascia and muscles of gluteal region
- Fascia and muscles of front of leg and dorsum of foot
- Fascia and muscles of lateral side of leg
- Fascia and muscles of back of leg and role of foot
- Detailed explanation of joints of Lower Leg: Pelvic Girdle, Hip, joint, Knee joint, Ankle joint, joints of foot.
- Identify the nerves of Lower Leg and mention their position course, relations distribution
- Indicate the blood vessels of Lower Leg a mention their position course, relation, distribution and main branches.
- Lymphatic drainage of Lower Leg
- Explain femoral triangle and subsartorial canal.
- Popliteal fossa
- Anatomy of structures of Lower Leg

### **Section – IX**

**Radiological Anatomy:** Radiographic appearance of Musculo-skeletal system of Upper limb, Lower limb, Spine.

#### **Anatomy Practical:**

**Marks: 75**

1. Surface Anatomy: To study, identify and mark the surface land marks on human body.
2. To study the muscles of trunk, lower and upper extremities and face on a dissected human body.
3. To study the Bones of Human Body with special emphasis on origin and insertion of muscles and ligaments.
4. To study the anatomy of joints of upper and lower extremities and vertebral column on models, charts and Cds.
5. To study the anatomy of C.N.S and P.N.S on models, charts and Cds
6. To study the gross anatomy of Respiratory, Digestive, Endocrine, Urinary and Genital system on models, charts and Cds

#### **Books Recommended:**

1. L. Williams & Warwick, Gray's Anatomy-Churchill Livingstone.
2. Inderbir Singh, Textbook of Anatomy with Colour Atlas–Vol. 1, 2, 3 Jaypee Brothers
3. B.D. Chaurasia, Human Anatomy–Volume 1, 2, 3 CBS Publishers & Distributors.
4. McMinn's Last's Anatomy–Regional and applied, Churchill Livingstone.
5. McMinn's et al–A Colour Atlas of Human Anatomy, Mosby.
6. Cunningham Manual of Practical Anatomy Vol. I, II, III, Churchill Livingstone.
7. Inderbir Singh, A Textbook on Human Neuro Antomy, Jaypee Brothers.
8. Snell-Clinical Anatomy-Lippincott

## ***BACHELOR OF PHYSIOTHERAPY (PART-I)***

### **Paper – II Physiology**

**Time: 3 Hrs.**

**M. Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25; Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

#### **Section – I**

##### **General Introduction:**

1. **Cell Introduction:** Outline of basic concepts of cell structure, functions of components and transport across membranes
2. **Skin:** Functions, blood flow and temperature regulation.
3. **Blood and Lymph:** Cell renewal system, haemoglobin, erythrocyte granulocyte, lymphocyte, coagulation, regulation of hydrogen within concentration of body fluids, fluid distribution and exchange.

#### **Section – II**

##### **Physiology of the systems of the body:**

1. **Digestion:** Control of food and water intake and secretion and absorption movements of the alimentary canal.
2. **Circulation:** Cardio-vascular system, mechanical and electro-physiological activity of the heart, regulation of heart, coronary circulation, haemodynamics, circulation through brain, skin and skeletal muscle.
3. **Excretion:** Renal functions including formation of Urine & Micturition.
4. **Respiration:** Respiratory gases, pulmonary gas exchange, control and mechanics of breathing, hypoxia, asphyxia, dyspnoea, oxygen therapy and resuscitation.
5. **Endocrine System:** Outline of various hormones and their actions, pituitary gland, thyroid, parathyroid, adrenal glands & Gonads.

**6. General Metabolism:** Carbohydrate, Protein & Fat Metabolism.

**Section – III**  
**Neuro – Physiology**

1. Neuron: Properties and functions.
2. Action Potential
3. Special properties of nerve trunks and tracts.
4. Motor units.
5. Reflex physiology
6. Synapse and synaptic transmission.
7. Supraspinal Control.
8. Cerebellum and basal ganglia
9. Autonomic nervous system.
10. Somatic sensation.
11. Pain
12. Taste, Olfaction, Auditory and Vision.
13. Neuro physiological psychology.

**Section – IV**  
**Muscle Physiology**

Gross and Microscopic

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

**Section –V**  
**Physiology of exercise and work**

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

## **PHYSIOLOGY PRACTICAL**

**Marks: 75**

### **To study the following Physiological Phenomena:**

1. Identification of blood cells and different counts.
2. W.B.C. Count.
3. R.B.C. Count.
4. Haemoglobin percentage and colour index.
5. E.S.R. and Blood groups.
6. Bleeding time and clotting time.
7. Respiratory efficiency tests.
8. Artificial respiration and C.P.R.
9. Pulse rate, Heart rate and measurement of Blood Pressure.
10. Respiratory rate and Auscultation.
11. Normal E.C.G.
12. Reflexes – Superficial Deep.
13. Sensations.
14. Tests for functions of Cerebrum.
15. Tests for functions of Cerebellum.

### **Books Recommended:**

1. Text book of Medical Physiology–Arthur Guyton (Mosby.)
2. Text book of Physiology–Anand & Manchanda, Tata McGraw Hill.
3. Human Physiology – Vol. 1 & 2, Chatterjee. CC, Calcutta. Medical Allied.
4. Concise Medical Physiology. Chaudhari, S.K, New Central Agency, Calcutta.
5. Principles of Anatomy and Physiology. Tortora & Grabowski–Harper Collins.
6. Text book of Practical Physiology – Ghai – Jaypee.



## ***BACHELOR OF PHYSIOTHERAPY (PART-I)***

### **Paper –III Biochemistry**

**Time: 3 Hrs.**

**M. Marks: 100**

**Theory: 75**

**Internal Assessment: 25**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

#### **Section – I**

1. **Biophysics:** Concepts of pH and buffers, acid base equilibrium osmotic pressure and its physiological applications.
2. **Cell:** Morphology, structure & kinetics of cell, cell membrane, Nucleus, chromatin, Mitochondria, Endoplasmic Reticulum, Ribosomes, DNA & RNA
3. **Water and Electrolyte:** Fluid compartment, daily intake and output sodium and potassium metabolism.
4. **Connective Tissue:** Mucopolysaccharide connective tissue proteins, glycoproteins.
5. **Nerve Tissue:** Composition, chemical mediators of Nerve activity.
6. **Isotopes:** Isotopes and their role in treatment and diagnosis of diseases.

#### **Section – II**

1. **Carbohydrates:** Definition, functions, sources, classifications, Monosaccharides, Disaccharides, Polysaccharides, mucopolysaccharide and its importance.
2. **Lipids :** Definition, function, sources, classification, simple lipid, compound lipid, derived lipid, unsaturated and saturated fatty acid, Essential fatty acids and their importance, Blood lipids and their implications, cholesterol and its importance.
3. **Proteins:** Definition, sources, kinetics, classification, simple protein conjugated protein, derived proteins, properties and varieties of proteins.

### Section -III

1. **Enzymes:** Definitions, classification, mode of action, factor affecting enzyme action, clinical importance of enzyme.
2. **Vitamins:** Classification, fat soluble vitamins, A, D, E & K, water soluble Vit. B complex & C, Daily Requirements, Physiological functions and diseases of Vitamin deficiency.
3. **Nutrition:** Dietary requirements & Balanced diet.
4. **Hormones:** Functional aspects of Hormones: insulin, Glucagon Thyroid and Parathyroid hormones, cortical & sex hormones.

### Section – IV

1. **Bioenergetics:** Concept of free energy change, Exogenic and endogenic reactions, concepts regarding energy rich compounds, Respiratory chain and Biological oxidation.
2. **Carbohydrate Metabolism:** Glycolysis, HMP shunt pathway, TCA cycle, glycogenesis, glycogenolysis, Glucogenesis, Maintenance of Blood Glucose, interconversions of different sugar.
3. **Lipid Metabolism:** Fatty acid oxidation, Fatty acid synthesis, Metabolism of cholesterol, Ketone bodies.
4. **Protein Metabolism:** Transamination, Transmethylation, Deamination, Fate of ammonia, urea synthesis and synthesis of creatine.

### Books Recommended:

1. Text book of Biochemistry - Chatterjee M.N.– Jaypee Brothers.
2. Text book of Biochemistry for Medical Students - Vasudevan D.M. - Jaypee Brothers.
3. Clinical Biochemistry – Metabolic & Clinical aspects - Marshall & Bangert – Churchill Livingstone.
4. Biochemistry Southerland – Churchill Livingstone

**BACHELOR OF PHYSIOTHERAPY (PART-I)**

**Paper – IV Electrotherapy – I**

**Time: 3 Hrs.**

**M. Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25; Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

**Section – I**

**Physical Principles:**

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

Structure of atom, molecules, elements and compounds. Electron theory, static and current electricity.

Conductors, Insulators, Potential difference, Resistance & Intensity.

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

a) Rectifying Devices – Thermionic Valves, Semiconductors, Transistors, Amplifiers, Transducers Oscillator circuits.

b) Capacitance, condensers in DC and AC Circuits.

c) Display devices & indicators – analogue & digital.

**Effects of Current Electricity:**

1. Chemical effects – Ions and Electrolytes, Ionisation, Production of a E.M.F. by chemical actions.

2. Magnetic effects, Molecular Theory of Magnetism, Magnetic fields, Electromagnetic Induction.

3. Milliammeter and Voltmeter, Transformers and Choke Coil. Thermal Effects – Joule's Law and Heat production.

4. Physical Principles of Sound and its Properties.

5. Physical Principles of Light and its Properties.
6. Electromagnetic Spectrum – Biophysical Application.

## **Section – II**

### **1. Electrical supply:**

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

## **Section – III**

### **Low Frequency Currents:**

1. Introduction to Direct, Alternating & Modified Currents.
2. Production of direct current – Physiological and Therapeutic Effects of Constant Current, Anodal and Cathodal Galvanism, Ionisation and their Application in Various Conditions.
3. Iontophoresis – Principles of Clinical Application, Indication, Contraindication, Precaution, Operational Skills of Equipment & Patient Preparation.
4. Modified Direct Current – various pulses, duration and frequency and their effect on Nerve And Muscle tissue. Production of interrupted and surged current & their effects.
5. Modified Direct Current – Physiological and therapeutic effects, principles of clinical application, indications, contra indications, precautions, operational skills of equipment & patient preparation.

### **6. Transcutaneous Electrical Nerve Stimulations (TENS):**

- a) Types of Low Frequency, pulse widths, frequencies & intensities used as TENS applications.
- b) Theories of pain relief by TENS.
- c) Principle of clinical application, effects & uses, indications, contraindications, precautions, operational skills of equipment & patient preparation.

## **Section – IV**

### **Electrical Reactions and Electro – diagnostic tests:**

- Electrical Stimuli and normal behaviour of Nerve and muscle tissue.  
Types of lesion and development of reaction of degeneration.  
Faradic – Intermittent direct current test.  
S.D. Curve and its application.  
Chronaxie, Rheobase & pulse ratio.

## Section – V

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

### 2. Ultra – Violet Rays (UVR):

a) Wavelength, frequency, types & sources of UVR generation, techniques of irradiation, physiological & therapeutic effects, indications, contraindications, precautions, operational skills of equipment & patient preparation.

b) Dosimetry of UVR.

## Section – VI

**Superficial heat** - Paraffin wax bath, moist heat, electrical heating pads.

a) Mechanism of production.

b) Mode of heat transfer.

c) Physiological & therapeutic effects.

d) Indications, contraindications, precautions, operational skills of equipment & patient preparation.

## Electrotherapy – I Practical

**Marks: 75**

1. To study the basic operation of electric supply to the equipment & safety devices.

2. To experience sensory and motor stimulation of nerves and muscles by various types of low frequency currents on self.

3. To locate and stimulate different motor points region wise, including the upper & lower limb, trunk free.

4. Therapeutic application of different low frequency currents Faradic foot bath, Faradism under pressure, Ionotophoresis.

5. To study the reactions of degeneration of nerves, to plot strength duration curves.

6. To find chronaxie and Rheobase.

7. To study a hydrocollator unit, its operations and therapeutic application of Hot packs – region wise.

8. To study the various types of Infrared lamps and their application to body region wise.

9. To study a paraffin wax bath unit, its operation and different methods of application – region wise.

10. To study the different types of Ultra violet units, their operation, assessment of test dose and application of U.V.R. – region wise.

11. To study a TENS Stimulator, its operation and application – region wise.

**Books Recommended:**

1. Electrotherapy Explained: Principles & Practice – Low & Reed – Butterworth Heinemann.
2. Clayton's Electrotherapy, (9th Ed.) Forster & Palastanga Bailliere Tindall.
3. Therapeutic Heat and Cold – Lehmann – Williams & Wilkins.
4. Principles and Practice of Electrotherapy – Kahn – Churchill Livingstone

**BACHELOR OF PHYSIOTHERAPY (PART-I)**

**Paper – V Exercise Therapy – I**

**Time: 3 Hrs.**

**M. Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25; Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

**Section – I**

Introduction to Exercise therapy, Principles, techniques and general areas of its application, Assessment & its importance.

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

Introduction to Movements including analysis of joint motion, muscle work and Neuro – muscular co – ordination.

Classification of movements – Describe the types, technique of application, indications, contraindications, effects and uses of the following:

- a) Active movement b) Passive movement
- c) Active assisted movement c) Resisted movement

**Section – II**

**Suspension therapy:** To study the principles, techniques of applications, indications, Contraindications, precautions, effects and uses of Suspension Therapy

**Section – III**

**Relaxation**

1. Describe relaxation, muscle fatigue, muscle spasm and tension (mental & physical).
2. Factors contributing to fatigue & tension.

3. Techniques of relaxation (local and general).
4. Effects, uses & clinical application.
5. Indications & contraindications.

#### **Section – IV**

##### **Therapeutic Gymnasium**

1. Setup of a gymnasium & its importance.
2. Various equipment in the gymnasium.
3. Operational skills, effects & uses of each equipment.

##### **Practical:**

**M. Marks: 75**

- 1) To study the position of joints, muscle work, and stability of various fundamental and derived positions.
- 2) To study the different types of muscle contraction, muscle work, group action of muscles and co-ordinated movements.
- 3) To practice the various types of suspension therapy and its application on various parts of body – region wise.
- 4) To study & practice local & general relaxation techniques.
- 5) To study the structure & function along with application of various equipment in a gymnasium.

##### **Books Recommended:**

1. Practical Exercise Therapy - Hollis - Blackwell Scientific Publications.
2. Therapeutic Exercises - Basmajian - Williams and Wilkins.
3. Therapeutic Exercises Foundations and Techniques - Kisner and Colby -F.A. Davis.
4. Proprioceptive Neuromuscular Facilitation - Voss et al - Williams and Wilkins.
5. Principle of Exercise Therapy -Gardiner - C.B.S. Delhi.



# Bachelor of Physiotherapy (Part-I)

## pMjwbI (lwzmI)

smW : 3 GMty

iQaUrI AMk : 75

ieMtrnl

AsY~smYnt : 25

kul AMk : 100

### pwT-kRm Aqy pwT-pusqkW

1. **swihq dy rMg** (sMpW. fw. mihl isMG), rvI swihq pRkwSn, AMimRqsr[
2. **pYrHw rcnw**
3. **pYrHw pVH ky pRSnW dy auqr**[
4. **ivAwkrx :**
  - (a) **pMjwbI DunI ivauNq** : aucwrn AMg, aucwrn sQwn qy ivDIAW, svr, ivAMjn, sur[
  - (A) **BwSw vMngIAW** : BwSw dw tkswlI rUp, BwSw Aqy aupBwSw dw AMqr, pMjwbI aupBwSwvW dy pCwx-icMnH[
  - (e) **Sbd bxqr Aqy Sbd rcnw** : pirBwSw, mu`Fly sMklp
  - (s) **Sbd SRyxIAW**

### AMk-vMf Aqy prIiKak leI hdwieqW

1. ikxy kivqw dw swr jW ausdw ivSw-vsqu (do ivcoN ie`k) Aqy ikxy khwxI dw swr, ausdw ivSw-vsqu, khwxI klw jW pwqr auswrI (do ivcoN ie`k) **(7;2)=14 AMk**
2. ikxy lyK/inbMD dw swr jW ausdw ivSw-vsqu (do ivcoN ie`k) Aqy ryKw-ic~qr : swr, ivSw-vsqu, S^sIAq dy gux (do ivcoN ie`k) **(7;2)=14 AMk**
3. pYrHw rcnw : iqMn iviSAW ivcoN ikxy ie`k au~qy pYrHw ilKx leI ikhw jwvy [ **7 AMk**
4. pYrHw dy ky aus bwry pMj pRSnW dy auqr **8 AMk**
5. nMbr 5 au~qy idqrI ivAwkrx dy AwDwr 'qy vrxnwqmk pRSn **16 AMk**
6. auprokq pusqk **swihq dy rMg** ivcoN sMKyp au~qrW vwly 08 pRSn pu`Cy jwxgy[ hryk dw au~qr pMjwh SbdW qoN vDyry nw hovy[ **(8;2)=16 AMk**

**not:** ieMtrnl AsY~smYnt 25 AMkW dI hY, jo kwlj v~loN inrDwirq  
idSw inrdySW Anuswr ienHW AMkW qoN v`KrI hovygI[ ies pypr dy  
kul AMk 75+25 = 100 hn[

## Bachelor of Physiotherapy (Part-I)

### mu`FlI pMjwbI

(In Lieu of Compulsory Punjabi)

smW : 3 GMty

iQaUrI : 75

ieMtrnl AsY~smYnt : 25

ku`l AMk : 100

1. a) **pMjwbI Bwsæw qy gurmuKI ilpI** : nwmkrx qy sMKyp jwx-pCwx, gurmuKI vrxmwlw, A`Kr kRm, svr vwhk (a A e), lgW-mwqrW, pYr ivc ibMdI vwly vrx, pYr ivc pYx vwly vrx, ibMdI, it`pI, A`Dk[  
A) **gurmuKI AwrQogRwPI Aqy aucwrn** : svr, ivAMjn : mu`FlI jwx-pCwx Aqy aucwrx, muhwrnI, lgW-mwqrW dI pCwx [  
(20 AMk)

2. a) **pMjwbI sæbd joV** : mukqw (do A`KrW vwly sæbd, iqMn A`KrW vwly sæbd), ishwrI vwly sæbd, ibhwrI vwly sæbd, AONkV vwly sæbd, dULYNkV vwly sæbd, lW vwly sæbd, dulwvW vwly sæbd, hoVy vwly sæbd, knOVy vwly sæbd, lgWkr (ibMdI, it`pI, A`Dk) vwly sæbd, Suæ`D-ASu`D[  
A) **pMjwbI sæbd bxqr** : DwqU, vDyqr (Agyqr, mDyqr, ipCyqr), pMjwbI kosægg sæbd Aqy ivAwkrixk sæbd  
(15 AMk)

3. a) **pMjwbI sæbd pRkwr** : sMXukq sæbd, smwsI sæbd, dojwqI sæbd, dohry/duhrukqI sæbd Aqy imsrq sæbd  
A) **pMjwbI sæbd rcnw** : ie`k-vcn bhu-vcn, ilMg-puilmG, bhuAwRQk sæbd, smwnArQk sæbd, bhuqy sæbdW leI ie`k sæbd, sæbd joV, ivroDAwrQk sæbd  
(20 AMk)

4. a) **pMjwbI vwk bxqr** : krqw, krm, iKirAw, pMjwbI vwkW ivc q`qW dI qrqIb, swDwrn vwk, ibAwnIAw vwk, pRSnvwck vwk, hukmI vwk, sMXukq Aqy imsrq vwk[  
A) **pMjwbI vwkW dI vrqon** : iviBMn smwijk/siBAwCwrk pRsiQqIAW dy AMqrgq, Gr ivc, bwzwr ivc, myly ivc, SOipMg mwl/isnmy ivc, ivAwh ivc, Dwrimk sQwnW ivc, dosqW Awid nwl[  
(20 AMk)

**AMk vMf Aqy prIiKak leI hdwieqW**

1. pihly Bwg ivcoN cwr pRsæn pu`Cy jwx[ ijnHW ivcoN do pRsænW dw au~qr dyxw lwjæmI hY[ hr pRsæn dy ds AMk hn[  
(10x2=20)
2. Bwg dUsrw ivcoN pMj-pMj nMbr dy iqMn pRsæn pu`Cy jwx[ swry pRsæn lwjæmI hn[ hr pRSn dy pMj AMk hn[  
(5x3=15)

3. Bwg qIsrw ivcoN cwr pRsæn pu`Cy jwx[ swry svwl lwzmI hn[  
ijnHW dy pMj-pMj AMk hn[

(5x4=20)

4. Bwg coQw ivcoN cwr pRSn pu`Cy jwx[ ijnHW ivcoN do pRsænW dw  
au~qr dyxw lwjæmI hY[ hr pRsæn dy ds AMk hn[

(10x2=20)

**not:** ieMtrnl AsY~smYnt 25 AMkW dI hY, jo kwlj v~loN inrDwirq  
idSw inrdySW Anuswr ienHW AMkW qoN v`KrI hovygI[ ies pypr dy  
kul AMk 75+25 = 100 hn[

## BACHELOR OF PHYSIOTHERAPY (PART-I)

### Paper VII: PROBLEM OF DRUG ABUSE: MANAGEMENT AND PREVENTION (Compulsory)

Time: 3 Hours

Max. Marks: 100

#### Instructions for the Paper Setters:

Section–A: (30 Marks): It will consist of ten short answer type questions. Candidates will be required to attempt six questions, each question carrying 05 marks. Answer to any of the questions should not exceed two pages.

Section–B: (45 Marks) It will consist of six essay type questions. Candidates will be required to attempt three questions, each question carrying 15 marks. Answer to any of the questions should not exceed four pages.

Section–C: (25 Marks) It will consist of two questions. Candidate will be required to attempt one question only. Answer to the question should not exceed 5 pages.

#### UNIT-I

- **Meaning of Drug Abuse**

- (i) Meaning, Nature and Extent of Drug Abuse in India and Punjab.
- (ii) Consequences of Drug Abuse for:
  - Individual : Education, Employment, Income.
  - Family : Violence.
  - Society : Crime.
  - Nation : Law and Order problem.

#### UNIT-II

- **Management of Drug Abuse**

- (i) Medical Management: Medication for treatment and to reduce withdrawal effects.
- (ii) Psychiatric Management: Counselling, Behavioural and Cognitive therapy.
- (iii) Social Management: Family, Group therapy and Environmental Intervention.

#### UNIT-III

- **Prevention of Drug abuse**

- (i) Role of family: Parent child relationship, Family support, Supervision, Shaping values, Active Scrutiny.
- (ii) School: Counselling, Teacher as role-model. Parent-teacher-Health Professional Coordination, Random testing on students.

#### UNIT-IV

- **Controlling Drug Abuse**

- (i) Media: Restraint on advertisements of drugs, advertisements on bad effects of drugs, Publicity and media, Campaigns against drug abuse, Educational and awareness program
- (ii) Legislation: NDPs act, Statutory warnings, Policing of Borders, Checking Supply/Smuggling of Drugs, Strict enforcement of laws, Time bound trials.

#### **References:**

1. Ahuja, Ram (2003), Social Problems in India, Rawat Publication, Jaipur.
2. Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.
3. Gandotra, R. and Randhawa, J.K. 2018. *Drug Abuse-Management and Prevention*. Kasturi Lal & Sons, Educational Publishers, Amritsar- Jalandhar.
4. Inciardi, J.A. 1981. *The Drug Crime Connection*. Beverly Hills: Sage Publications. 23
5. Randhawa, J.K. 2018. *Drug Abuse-Management and Prevention*. Kasturi Lal & Sons, Educational Publishers, Amritsar- Jalandhar.
6. Kapoor. T. (1985) *Drug epidemic among Indian Youth*, New Delhi: Mittal Pub.
7. Modi, Ishwar and Modi, Shalini (1997) *Drugs: Addiction and Prevention*, Jaipur: Rawat Publication.
8. National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences, 2004.
9. Sain, Bhim 1991, *Drug Addiction Alcoholism, Smoking obscenity* New Delhi: Mittal Publications.
10. Sandhu, Ranvinder Singh, 2009, *Drug Addiction in Punjab: A Sociological Study*. Amritsar: Guru Nanak Dev University.
11. Singh, Chandra Paul 2000. *Alcohol and Dependence among Industrial Workers*: Delhi: Shipra.
12. Sussman, S and Ames, S.L. (2008). *Drug Abuse: Concepts, Prevention and Cessation*, Cambridge University Press.
13. World Drug Report 2010, United Nations office of Drug and Crime.

14. World Drug Report 2011, United Nations office of Drug and Crime.

**BACHELOR OF PHYSIOTHERAPY (PART-II)**  
**Paper – I Pathology & Microbiology**

**Time: 3 Hrs.**

**M. Marks: 100**

**Theory: 75**

**Internal Assessment: 25**

***Instructions for Paper Setters:***

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

**Section – I**

**Pathology (Part 1) General Pathology**

1. Aims and objectives of the study of pathology. Meaning of terms, etiology, pathogenesis and lesions.
2. Causes of disease .cell injury – causes of cell injury features of cell injury mechanism of cell injury – hypoxia, free radical injury. Necrosis and gangrene.
3. Inflammation–definition, events of acute inflammation, chemical mediator of inflammation, morphological types of acute inflammation, chronic inflammation, difference between acute and chronic inflammation.
4. REPAIR–primary healing, secondary healing, factors affecting healing and repair healing of skin, muscle and bone.
5. Fluid and hemodynamic derangements–oedema, hyperemia, Haemorrhage, shock, embolism, thrombosis, infarction

6. Immunity—natural and acquired. Immunological mechanisms of tissue injury, hypersensitivity reactions, general features of autoimmune diseases and immunodeficiency diseases.
7. Neoplasia: characteristic of benign and malignant tumors, grading and staging of malignant tumors, a brief outline of the carcinogenic agents and methods of diagnosis of malignancy and general effects of malignancy on the host
8. Nutritional Disorders: deficiency disorders (protein deficiency, vitamin deficiency (A,B,C,D,E) causes , features , a brief outline of the methods of diagnosis (details not required).

## **Part 2**

Systemic pathology: a brief outline of etiology, pathogenesis and general features of disease of the following systems. (The morphology, microscopic details and details of diagnostic procedures are not required).

1. Blood: disorders of RBC, WBC, platelets
2. Blood Vessels: atherosclerosis, thromboangitis obliterance, varicose vein, DVT, thrombophlebitis, lymphoedema.
3. Disease of heart: congestive cardiac failure, ischemic heart disease, rheumatic heart disease, infective heart disease (pericarditis, myocarditis, endocarditis)
4. Respiratory System: Pneumonias, Bronchiectasis, Emphysema, Chronic bronchitis, Asthma, Tuberculosis.
5. Joints disorders: Arthritis- types and their features.
6. Bone Disorders: osteoporosis, pagets disease, osteogenesis imperfecta, osteomyelitis, tumors—osteosarcoma, chondrosarcoma, ewings sarcoma, multiple myeloma (a brief outline)
7. Muscles: muscular dystrophy, myasthenia gravis.
8. Nervous System: meningitis, encephalitis, vascular diseases of brain, poliomyelitis, nerve injuries

## **Section – II**

### **Microbiology**

#### **Part–I**

1. An introduction to microbiology, Classification of microorganisms,
2. Infection – types, source, portals of entry, spread.
3. Prevention and control of infection, Disinfection and antiseptics Sterilization

#### **Part–II**

An outline of the following infectious diseases with respect to the causative organism, mode of transmission, pathogenesis, prevention, and diagnostic tests (details of the execution and interpretation of the tests not required)

Chicken Pox, Measles, Mumps, Influenza, Diphtheria, Whooping Cough, Tetanus, Tuberculosis, Leprosy, Rubella, Cholera, Gastroenteritis, Food Poisoning, Hepatitis, AIDS, Typhoid, Rabies, STD, Ameobiasis Kalaazar, Malaria, Filaria.

**Books Recommended:**

1. Robbins Pathological Basis of Disease - Cotran, Kumar & Robbins - W.B. Saunders.
2. General Pathology - Walter & Israel - Churchill Livingstone.
3. Muirs Textbook of Pathology - Anderson - Edward Arnold Ltd.
4. Text book of Pathology - Harsh Mohan - Jaypee Brothers.
5. Pathology: Implications for Physical Therapists - Goodmann and Boissonnault - W.B. Saunders.
6. Essential of Medical Microbiology - Bhatia & Lal - Jaypee Brothers.
7. Medical Microbiology - Mims - Jaypee Brothers.
8. Microbiology: An Introduction for the Health Sciences – Ackerman and Richards - W.B. Saunders Co.



**BACHELOR OF PHYSIOTHERAPY (PART-II)**

**Paper – II**  
**Pharmacology**

**Time: 3 Hrs.**

**M. Marks: 100**

**Theory: 75**

**Internal Assessment: 25**

***Instructions for Paper Setters:***

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

**Section – I**

1. General action of drugs.
2. Drug allergy and idiosyncrasy.
3. Drug toxicity
4. Metabolic fate of drug
5. Methods of administration
6. Chemical character of drugs
7. Drugs acting on respiratory system
8. Vitamins

## **Section – II**

1. Drugs acting on Central nervous system – anaesthetics, alcohols, alkaloids, narcotics, antipyretics, hypnotics, sedatives, anticonvulsants, stimulants, psychotherapeutics. (brief description)
2. Drugs acting on peripheral nervous system – stimulating and inhibiting cholinergic and anticholinergic activity.
3. Drugs acting on neuromuscular junction and muscles
4. Drugs for pain management.

## **Section – III**

1. Hormones and drugs affecting endocrine functions
2. Drugs acting on cardiovascular system- (antianginal drugs, Drugs for MI, Brief outline of drugs for CHF, antihypertensive drugs).
3. Chemotherapeutic agents- Modern antibiotics, antitubercular drugs, antiamoebic drugs etc.

### **Books Recommended:**

1. Pharmacology and Pharmacotherapeutics - R.S. Satoskar – Popular Publications, Bombay.
2. The Pharmacologic Principles of Medical Practice - Krantg & Jelleff - Calcutta Scientific Book Agency.
3. Pharmacology - Praseem K. Das. – Churchill Livingstone
4. Essential of Medical Pharmacology - K.D. Tripathi - Jaypee Brothers

***BACHELOR OF PHYSIOTHERAPY (PART-II)***

**Paper – III: Electrotherapy – II**

**Time: 3 Hrs.**

**M. Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25; Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

**SECTION – I**

1. Review of Neuro – muscular Physiology including effects of electrical stimulation.
2. Physiological responses to heat gain or loss on various tissues of the body.
3. Therapeutic effects of heat, cold and electrical currents.
4. Physical principles of Electro – magnetic radiation.
5. Physics of sound including characteristics and propagation.

**SECTION – II**

1. **High frequency currents (S.W.D. and M.W.D.)** – Production, biophysical effects, types, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.
2. **(a) Medium frequency currents (Interferential Therapy)** – Conceptual framework of medium frequency current therapy, production, biophysical effects, types, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.
- (b) Di-Dynamic Currents, Russian Current** – Production, types, therapeutic uses and contraindications of Russian currents and dynamic currents.
3. **High frequency sound waves (Ultrasound)** – Production, biophysical effects, types, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.

### SECTION – III

1. **Therapeutic light in Physiotherapy (LASER)** – Definition, historical background, physical principles, biophysical effects, types, production, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.
2. **Therapeutic cold (Cryotherapy)** – Sources, biophysical effects, types, therapeutic effects, indications, contraindications, precautions, application techniques and patient preparation.
3. **Traction-** principles, physiological & therapeutic effects classification, types, indications, contraindications, techniques of application, operational skills & precautions
4. **Therapeutic mechanical pressure (Intermittent compression therapy)** – Principle, biophysical effects, types, therapeutic effects, indications, contraindications, precautions, operational skills and patient preparation.

### SECTION – IV

1. **Electro – diagnosis** – Instrumentation, definition & basic techniques of E.M.G. and E.N.G.
2. **Bio-feedback** – Instrumentation, principles, therapeutic effects, indications, contraindications, limitations, precautions, operational skills and patient preparation

#### **Electrotherapy – II (Practical)**

**Marks: 75**

1. To study a short wave diathermy unit, its operation and different methods of application – region wise.
2. To study a Micro wave diathermy unit, its operation unit, its operation and different methods of application – region wise.
3. To study an Ultrasound unit, its operation and different methods of application – region wise.
4. To study a Laser unit, its operation and different methods of application – region wise.
5. To study various forms of therapeutic cold application region wise including – ice, cold packs, vapour coolant sprays, etc.

6. To study a Intermittent therapy unit, its operation and different methods of application – region wise.
7. To study a Interferential pneumatic therapy unit, its operation and different methods of application – region wise.
8. To observe various Electro – myography (EMG) procedures.
9. To observe various Electro – neurography (ENG) procedures.
10. To study a Bio feedback unit, its operation and different methods of application – region wise.
11. To study & practice various traction techniques, including manual and mechanical Procedures.

**Books Recommended:**

1. Electrotherapy Explained: Principles & Practice Low & Reed – Butterworth Heinmann.
2. Clayton’s Electrotherapy (10th edition) – Kitchen & Bazin – W.B. Saunders..
3. Therapeutic Heat and Cold Lehmann – Williams & Wilkins.
4. Principles and Practice of Electrotherapy – Kahn – Churchill Livingstone.
5. Electrotherapy: Clinics in Physical Therapy – Wolf – Churchill Livingstone

***BACHELOR OF PHYSIOTHERAPY (PART-II)***

**Paper – IV Exercise Therapy – II**

**Time: 3 Hrs.**

**M. Marks: 200**

**Theory: 75**

**Practical: 75**

**Internal Assessment: 50 (Th-25; Pr-25)**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

**Section – I**

**Therapeutic Exercises**

1. Principle, classification, techniques, physiological & therapeutic effects, indications & contraindications of therapeutic exercises.
2. Assessment & evaluation of a patient (region wise) to plan a therapeutic exercise program.
3. Joint Mobility – Etiogenesis of Joint stiffness, general techniques of mobilization, effects, indications, contraindications & precautions.

4. Muscle Insufficiency – Etiogenesis of muscle insufficiency (strength, tone, power, endurance & volume), general techniques of strengthening, effects, indication, contraindications & precautions.
5. Neuromuscular Inco-ordination – Review normal neuromuscular coordination, Etiogenesis of neuromuscular in co-ordination & general therapeutic techniques, effects, indications, contraindications & precautions.
6. Functional re-education – General therapeutic techniques to re-educate ADL function.

## **Section – II**

### **Posture, Balance, Gait:**

1. Normal Posture – Overview of the mechanism of normal posture.
2. Abnormal Posture – Assessment, Types, etiogenesis, management, including therapeutic exercises.
3. Static and Dynamic Balance – Assessment & management including therapeutic exercises.
4. Gait – Overview of normal gait & its components. Gait deviations - Assessment, Types, etiogenesis, management, including therapeutic exercises.
5. Types of walking aids, indications, effects & various training techniques.

## **Section – III**

### **Manual Muscle Testing**

- a) Principles and application techniques of Manual muscle testing.
- b) Testing position, procedure and grading of muscles of the upper limb, lower limb and trunk etc.

## **Section – IV**

### **Goniometry**

#### **Goniometers and its types:**

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

## **Section – V**

### **Soft Tissue Manipulation (Therapeutic Massage)**

- a) History, various types of soft tissue manipulation techniques.
- b) Physiological effects of soft tissue manipulation on the following systems of the body; Circulatory, Nervous, Musculoskeletal, Excretory, Respiratory, Integumentary system and Metabolism.
- c) Classify, define and describe: - effleurage, stroking, kneading, petrissage, deep friction, vibration and shaking etc.
- d) Preparation of patient: Effects, uses, indications and contraindications of the above manipulation.

**Section – VI**  
**Hydrotherapy:**

1. Basic principles of fluid mechanics, as they relate to hydrotherapy.
2. Physiological & therapeutic effects of hydrotherapy, including joint mobility muscle Strengthening & wound care etc.
3. Types of Hydrotherapy equipment, indications, contraindications, operation skills & patient preparation.

**Section – VII**

**Special Techniques:**

1. Introduction to special mobilization & manipulation techniques, effects, indications & contraindications.
2. Conceptual framework, principle of proprioceptive neuromuscular facilitation (PNF) techniques, including indications, therapeutic effects and precautions.
3. Review normal breathing mechanism, types, techniques, indications, contraindications, therapeutic effects & precautions of breathing exercises.
4. Group Theory – Types, advantages & disadvantages.
5. Exercises for the normal person – Importance and effects of exercise to maintain optimal health & its role in the prevention of diseases. Types, advantages, disadvantages, indications, contraindications & precautions for all age groups.
6. Introduction to Yoga – Conceptual framework, various “asanas”, the body – mind relationship, effects & precautions.
7. Role of muscle energy technique.
8. Introduction to common ailments: Respiratory disorders, Cardiovascular disorders, Endocrine & Metabolic disorders and Obstetrics & Gynecological disorders in the light of Yoga Management

**Exercise Therapy – II (Practical)**

**Marks: 75**

1. To practice all soft tissue manipulative techniques region wise – upper limb, lower limb, neck, back and face.
2. To practice the measurement of ROM of joints – upper limb, lower limb & trunk.
3. To practice the grading of muscle strength region wise – upper limb, lower limb and trunk.
4. To practice assessment & evaluative procedures, including motor, sensory, neuromotor coordination, vital capacity, limb length & higher functions.
5. To study & practice the various techniques of mobilization of joints region wise.
6. To study & practice the various techniques of progressive strengthening exercises of muscles region wise.
7. To study & practice the use of various ambulation aids in gait training.
8. To assess & evaluate ADL's and practice various training techniques.



9. To study & practice mat exercises.
10. To assess & evaluate normal & abnormal posture & practice various corrective techniques.
11. To assess & evaluate equilibrium / balance & practice various techniques to improve balance.
12. To study the structure & functions of hydrotherapy equipments & their applications.
13. To study & practice various group exercise therapies.
14. To practice & experience effects of basic yoga “asanas”.
15. To study, plan & practice exercise programmes for normal persons of various age groups.

**Books Recommended:**

- Practical Exercise Therapy - Hollis - Blackwell Scientific Publications.
- Therapeutic Exercises - Basmajian - Williams & Wilkins.
- Therapeutic Exercises Foundations and Techniques - Kisner & Colby -F.A. Davis.
- Proprioceptive Neuromuscular Facilitation - Voss et al - Williams and Wilkins.
- Principle of Exercise Therapy - Gardiner - C.B.S. Delhi.
- Orthopaedic Physical Therapy - Woods - Churchill Livingstone.
- Manipulation ad Mobilisation Extremities and Spinal Techniques - Edmond - Mosby.
- Aquatic Exercise Therapy - Bates and Hanson-W.B. Saunders.
- Manual Examination and Treatment of Spine and Extremities - Wadsworth - Lippincott.
- Hydrotherapy: Principles and Practices - Campion - Butterworth Heinmann.
- Muscle testing and functions - Kendall - Williams & Wilkins.
- Daniels and Worthingham's - Muscle Testing - Hislop & Montgomery - W.B. Saunders.
- Measurement of Joint Motion: A Guide to Goniometry - Norkins & White - F.A. Davis.
- . Beard's Massage - Wood – W. B. Saunders

***BACHELOR OF PHYSIOTHERAPY (PART-II)***

**Paper – V Biomechanics**

**Time: 3 Hrs.**

**M. Marks: 100**

**Theory: 75**

**Internal Assessment: 25**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

**Section – I**

**Mechanics**

- a) Introduction to mechanics including motion, forces, parallel forces system
- b) Newton's law of motion, concurrent force systems – composition forces, muscle action line etc.
- c) Centre of Gravity, line of gravity, stability and equilibrium.
- d) Introduction to Bio-Mechanics and terminology.

**Section – II**

**Joint Structure and Function:**

- a) Basic principles of Joint design and a human joint.

- b) Tissues present in human joint including fibrous tissue, bone cartilage and connective tissue.
- c) Classification of joints.
- d) Joint function, Kinematics chains and range of motion.
- e) Recall anatomy and study the biomechanics of the spine, shoulder girdle, joints of the upper extremity, pelvic girdle and the joints of the lower extremity.

### **Section – III**

#### **Muscle Structure and function:**

- a) Mobility and stability functions of muscle.
- b) Elements of muscle structure and its properties.
- c) Types of muscle contractions and muscle work.
- d) Classification of muscles and their functions.
- e) Group action of muscles, Co-ordinated movement.

### **Section – IV**

#### **Posture & Gait:**

- a) Posture – Definition, factors responsible for posture, relationship of gravity on posture.
- b) Postural imbalance – factors responsible for imbalance in Static and dynamic positions including ergonomics.
- c) Description of Normal gait, determinants of gait, spatio temporal features and analysis.
- d) Gait deviations – Types, Causative factors and analysis

#### **Practical:**

1. To study the effects of forces on objects.
2. To find out the C.G. of an object.
3. To identify axis and planes of motion at the joints of spine, shoulder girdle, joints of upper extremity, Pelvic girdle and joints of lower extremity.
4. To study the different types of muscle contraction, muscle work, group action of muscles of co-ordinated movements.
5. Analysis of Normal posture respect to L.O.G. and the optimal position of joints in antero - posterior and lateral views.
6. Analysis of normal gait and measurement of spatio temporal features.

#### **Books Recommended:**

1. Joint Structure and Function – A Comprehensive Analysis - Norkins & Levangie - F.A. Davis.
2. Measurement of Joint Motion – A Guide to Goniometry - Norkins & White - F.A. Davis.
3. Brunnstrom's Clinical Kinesiology - Smith et al - F.A. Davis.
4. Basic Biomechanics Explained - Low & Reed - Butterworth Heinmann.
5. Kinesiology: Applied to Pathological Motion - Soderberg Lippincott.

## ***BACHELOR OF PHYSIOTHERAPY (PART-II)***

### **Paper – VI Psychology**

**Time: 3 Hrs.**

**M. Marks: 100**

**Theory: 75**

**Internal Assessment: 25**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

### **Section – I General Psychology**

**1. Definition of Psychology:** Definition of psychology, information in relation to following schools methods and branches.

**a. Schools:** Structuralism, functionalism, behaviourism psychoanalysis, gestalt psychology.

**b. Methods:** Introspection, observation, inventory and experimental method.

**c. Branches:** General, child, social, abnormal, industrial, clinical, counseling, educational.

**2. Heredity and Environment:** Twins, Relative importance of heredity and environment, their role in relation to physical characteristics, intelligence and personality, nature – nature controversy.

**3. Development and Growth Behavior:** Infancy, childhood, adolescence, adulthood, middle age, old age.

- 4. Intelligence:** Definitions, IQ, Mental Age, List of various intelligence tests – WAIS, WISC, Bhatia's performance test, Raven's Progressive Matrices test.
- 5. Motivation:** Definitions: Motive, drive, incentive and reinforcement, Basic information about primary needs: hunger thirst, sleep, elimination activity, air, avoidance of pain, attitude to sex. Psychological Needs: Information, security, self-esteem, competence, love and hope.
- 6. Emotions:** Definitions: Differentiate from feelings, psychological changes of emotion, Role of RAS, hypothalamus, cerebral cortex, sympathetic nervous system, adrenal gland, heredity and emotion, Nature and control of anger, fear and anxiety.
- 7. Personality:** a) Definitions: List of components: Physical characteristics, character, abilities, temperament, interest and attitudes.  
 b) Discuss briefly the role of heredity, nervous system, physical characteristics, abilities, family and culture of personality development.  
 c) Basic concepts of Freud: unconscious, conscious, Id, ego and superego, List and define the oral, anal and phallic stages of personality development list and define the 8 stages as proposed by Erickson, 4 concepts of learning as proposed by Dollard and Miller; drive, cue, response and reinforcement.  
 d) Personality assessment: interview, standardized, non-standardized. Exhaustive, and stress interviews, list and define inventories BAI, CPI and MMPI, projective test: Rorschach, TAT and sentence completion test.
- 8. Learning:** Definition: List the laws of learning as proposed by Thorndike. Types of learning: Briefly describe classical conditions, operant conditioning, insight, observation and Trial and Error type list the effective ways to learn: Massed Vs. Spaced, Whole Vs. Part, Recitation Vs. Reading, Serial Vs. Free Recall, knowledge of results, Association Organization, Mnemonic methods, incidental Vs. Intentional learning, role of language.
- 9. Thinking:** Definition, concepts, creativity, steps in creative thinking, list the traits of creative people, delusions.
- 10. Frustration:** Definition, sources, solution, Conflict; Approach – approach, Avoidance – avoidance, and approach – avoidance solution.
- 11. Sensation, Attention and Perception** a) List of Senses: Vision, Hearing, Olfactory, Gustatory and cutaneous sensation, movement, equilibrium and visceral sense. Define attention and list factors that determine attention: nature of stimulus intensity, colour, change, extensity, repetition, movement size, curiosity, primary motives.  
 b) Define perception and list the principles of perception: Figure ground, constancy, similarity, proximity, closure, continuity values and interests, past experience context, needs, moods, religion, sex and age, perceived susceptibility perceived seriousness, perceived benefits and socioeconomic status.  
 c) Define illusion and hallucination. d) List visual, auditory, cutaneous, gustatory and olfactory hallucination.
- 12. Democratic and Authoritarian Leadership:** Qualities of leadership: Physical factors, intelligence, self-confidence, sociability, will and dominance. Define attitude. Change of attitude

by: Additional information, changes in-group – affiliation, enforced modification by law and procedures that affect personality. (Psychotherapy, Counseling and religious conversion).

**13.** Defence Mechanisms of the Ego: Denial, rationalization, projection, reaction formation, identification, repression, emotional insulation, undoing, interjection, acting out depersonalization.

## **Section – II Health Psychology**

**1.** Psychological Reactions of a Patient: Psychological reactions of a patient during admission and treatment anxiety, shock, denial, suspicion, questioning, loneliness, regression, shame, guilt, rejection, fear, withdrawal, depression, egocentricity, concern about small matters, narrowed interests, emotional over reactions, perpetual changes, confusion, disorientation, hallucinations, delusions, illusions, anger, hostility, loss of hope.

**2.** Reactions to Loss: Reactions to loss, death and bereavement shock and disbelief, development of awareness, restitution, resolution. Stages of acceptance as proposed by Kubler – Ross.

**3.** Stress: Physiological and Psychological relation to health and sickness: psychosomatic, professional stress burnout.

**4.** Communications: a) Types verbal, non-verbal, elements in communication, barriers to good communication, developing effective communication, specific communication techniques. b) Counseling: Definition, Aim, differentiate from guidance, principles in counseling and personality qualities of counselors.

**5.** Compliance: Nature, factors, contributing to non – compliance, improving compliance.

**6.** Emotional Needs: Emotional needs and psychological factors in relation to unconscious patients, handicapped patients, bed – ridden patients, chronic pain, spinal cord injury, paralysis, cerebral palsy, burns, amputations, disfigurement, head injury, degenerative disorders, parkinsonism, leprosy, incontinence and mental illness.

**7.** Geriatric Psychology: Specific psychological reactions and needs of geriatric patients.

**8.** Pediatric Psychology: Specific psychological reactions and needs of pediatric patients.

**9.** Behavior Modifications: Application of various conditioning and learning principles to modify patient behaviours.

**10.** Substance Abuse: Psychological aspects of substance abuse: smoking, alcoholism and drug addiction.

**11.** Personality Styles: Different personality styles of patients.

### **Books Recommended:**

1. Introduction to Psychology - Mums - I.D.P. Co.
2. Foundation of Psychology - Weld - Publishing House, Bombay.
3. Introduction to Social Psychology – Akolkar – Oxford Publishing House.
4. Psychology and Sociology – Applied to Medicine – Porter & Alder - W.B. Saunders.
5. Behavioural Sciences for Medical Undergraduates – Manju Mehta - Jaypee Brothers.
6. Elementary Psychology - Mohsin - Moti Lal Banarsi Dass, Delhi.

***BACHELOR OF PHYSIOTHERAPY (PART-II)***

**Paper – VII Sociology & Community Health**

**Time: 3 Hrs.**

**M. Marks: 100**

**Theory: 75**

**Internal Assessment: 25**

**Section A (10 Marks):** There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

**Section B (50 Marks):** It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

**Section C (15 Marks):** It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

**Description:**

1. **Introduction:** Definitions of sociology, sociology as a science of society, uses of the study of sociology, application of knowledge of sociology in physiotherapy and occupational therapy.
2. **Sociology & Health:** Social factors affecting health status, social consciousness and perception of illness, social consciousness and meaning of illness, decision 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:** Concept of social groups, influence of formal and informal groups on health and sickness, the role of primary groups and secondary groups in the hospitals and rehabilitation settings.

5. **Family:** Influence of family on human personality, discussion of changes in the functions of a family, influence of family on the individual's 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 & 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 modern caste system and its trends.

9. **Social Change:** Meaning of social change, factors of social change, human adaption and social change, social change and stress, social change and deviance, social change and health programmes, 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, religion, law and other means of social control in the regulation of human behavior, social deviance and disease

11. **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

12. **Social Security:** Social security and social legislation in relation to the disabled.

13. **Social Worker:** The role of medical social worker.

### **Community Health:**

14. Introduction to Community Health, community and rehabilitation.

15. Community based rehabilitation in relation to different medical and surgical conditions e.g. Cholera, Typhoid, Diphtheria, Leprosy, Poliomyelitis, HIV & AIDS, Hepatitis etc.

Prevention of diseases at different levels.

16. Community based rehabilitation vs. institutional based rehabilitation – comparison and different aspects. Community resources and their uses.

### **Books Recommended:**

1. Mcgee - Sociology - Drydon Press Illinois.

2. Kupuswamy - Social Changes in India - Vikas, Delhi.

3. Ahuja - Social Problems - Bookhive, Delhi.

4. Ginnsberg - Principles of Sociology - Sterling Publications.



5. Parter & Alder - Psychology & Sociology Applied to Medicine - W.B. Saunders.
6. Julian - Social Problems - Prentice Hall.

## **BACHELOR OF PHYSIOTHERAPY (PART-II)**

### **Environmental Studies (Compulsory)**

**Theory Lectures: 50 Hours**

**Max. Marks: 100**

**Time: 3 Hour**

**Theory: 75; Int. Ass.: 25**

**Section–A (24 Marks):** It will consist of ten short answer type questions. Candidates will be required to attempt six questions, each question carrying four marks. Answer to any of the questions should not exceed two pages.

**Section–B (36 Marks):** It will consist of six essay type questions. Candidates will be required to attempt three questions, each question carrying twelve marks. Answer to any of the questions should not exceed four pages.

**Section–C (15 Marks):** It will consist of two questions. Candidate will be required to attempt one question only of fifteen marks. Answer to the question should not exceed 5 pages. In this section the students will be required to write on the environment of an area/ ecosystem/ village industry/ disaster/ mine/ dam/ agriculture field/ waste management/ hospital etc. with its salient features, limitations, their implications and suggestion for improvement.

1. **The multidisciplinary nature of environmental studies:** Definition, scope & its importance, Need for public awareness.
2. **Natural resources:** Natural resources and associated problems.
  - a) **Forest resources:** Use of over 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 problems.

**c) Mineral resources:** Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

**d) Food resources:** World food problems, change caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problem, salinity, case studies.

**e) Energy resources:** Growing of energy needs, renewable and non-renewable energy resources, use of alternate energy sources, case studies.

**f) Land resources:** Land as a resource, land degradation, soil erosion and desertification.

**g) Role of an individual in conservation of natural resources, Equitable use of resources for sustainable lifestyles.**

### **3. Ecosystem:**

Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids.

Introduction, types, characteristic features, structure and function of the following ecosystems:

- a. Forest ecosystem
- b. Grassland ecosystem
- c. Desert ecosystem
- d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

### **4. Biodiversity and its Conservation:**

**Definition:** Genetic, species and ecosystem diversity, Biogeographical classification of India.

**Value of Biodiversity:** Consumptive use; productive use, social, ethical, aesthetic and option values. Biodiversity of global, National and local levels, India as mega-diversity nation "Hot-spots of biodiversity.

**Threats to Biodiversity:** Habitat loss, poaching of wild life, man wildlife conflicts  
Endangered and endemic species of India.

**Conservation of Biodiversity:** *In situ* and *Ex-situ* conservation of biodiversity

### **5. 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:** Causes, effects and control measures of urban and industrial wastes.

Role of an individual in prevention of pollution.

Pollution case studies Disaster Management: Floods, Earthquake, Cyclone and Landslides

## **6. Social Issues and Environment:**

- From unsustainable to sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case studies
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation
- Consumerism and waste products
- Environmental Protection Act
- Air (prevention and Control of Pollution) Act
- Water (prevention and Control of Pollution) Act
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation
- Public awareness

## **7. Human population and the environment**

- Population growth, variation among nations
- Population explosion-Family welfare programme
- Environment and human health
- Human rights
- Value education
- HIV / AIDS
- Women and child welfare
- Role of information technology in environment :and human health
- Case studies
- Road Safety Rules & Regulations: Use of Safety Devices while Driving, Do's and Don'ts while Driving, Role of Citizens or Public Participation, Responsibilities of Public under Motor Vehicle Act, 1988, General Traffic Signs

- Accident & First Aid: First Aid to Road Accident Victims, Calling Patrolling Police & Ambulance

## 8. National Service Scheme

- **Introduction and Basic Concepts of NSS:** History, philosophy, aims & objectives of NSS; Emblem, flag, motto, song, badge etc.; Organizational structure, roles and responsibilities of various NSS functionaries.
- **Health, Hygiene & Sanitation:** Definition, needs and scope of health education; Food and Nutrition; Safe drinking water, water borne diseases and sanitation (Swachh Bharat Abhiyan); National Health Programme; Reproductive health.
- **Entrepreneurship Development:** Definition & Meaning; Qualities of good entrepreneur; Steps/ ways in opening an enterprise; Role of financial and support service Institutions.
- **Civil/Self Defense:** Civil defense services, aims and objectives of civil defense; Needs for self-defense training.

## 9. Field Visits:

- Visit to a local area to document environmental assets—river / forest / grassland / hill / mountain.
- Visit to a local polluted site—Urban / Rural / Industrial / Agricultural.
- Study of common plants, insects, birds.
- Study of simple ecosystems—pond, river, hill slopes, etc.
- Contribution of the student to NSS/any other social cause for service of society.

**Note:** In this section the students will be required to visit and write on the environment of an area/ ecosystem/village industry/disaster/mine/dam/agriculture field/waste management/hospital etc. with its salient features, limitations, their implications and suggestion for improvement.

## References/Books:

1. Agarwal, K. C. 2001. Environmental Biology, Nidhi Publications Ltd. Bikaner.
2. Bharucha, E. 2005. Textbook of Environmental Studies, Universities Press, Hyderabad.
3. Down to Earth, Centre for Science and Environment, New Delhi.
4. Jadhav, H. & Bhosale, V. M. 1995. Environmental Protection and Laws. Himalaya Pub.
5. Joseph, K. and Nagendran, R. 2004. Essentials of Environmental Studies, Pearson Education (Singapore) Pte. Ltd., Delhi.
6. Kaushik, A. & Kaushik, C. P. 2004. Perspective in Environmental Studies, New Age International (P) Ltd, New Delhi.
7. Miller, T. G. Jr. 2000. Environmental Science, Wadsworth Publishing Co.
8. Sharma, P. D. 2005. Ecology and Environment, Rastogi Publications, Meerut.
9. Booklet on Safe Driving. Sukhmani Society (Suvidha Centre), District Court Complex,

Amritsar

10. Kanta, S., 2012. Essentials of Environmental Studies, ABS Publications, Jalandhar.

**BACHELOR OF PHYSIOTHERAPY (PART-III)**  
**Paper – I Orthopaedics**

**Time: 3 Hrs.**

**M. Marks: 200**

**Theory: 80**

**Practical: 80**

**Internal Assessment: 40**

1. There will be Ten Questions of equal Marks distribution. Candidate will have to answer any eight questions.
2. The questions should be equally distributed in the whole syllabus.

**Section – I**

1. **Introduction to Orthopaedics:** Introduction to orthopaedic terminology. Types of pathology commonly dealt with, clinical examination, common investigations X- rays & imaging techniques and outline of non – operative management.
2. **Principles of Operative Treatment:** List indications, contraindication and briefly outline principles of: Athrodesis, Arthroplasty, Osteotomy, Bonegrafting, Tendon – Transfers and Arthroscopy.
3. **Sprains and Muscle Strains:** List common sites of sprains and muscle strains and describe the clinical manifestations and treatment. Viz. tennis elbow, golfer's elbow, Dequervan's disease, tenovaginitis, trigger finger, carpal tunnel syndrome and plantar fasciitis.
4. **Sports Injuries:** Injuries related to common sports their classification and management.

**Section – II**

1. **Fractures and Dislocations:** General Principles, outline the following:
  - i) Types of Fractures including patterns. Open and closed fractures and fracture – dislocations.

- ii) Differences between dislocation & subluxation.
- iii) General & Local signs & symptoms of fractures & dislocation.
- iv) Principle of management of fractures & dislocations.
- v) Prevention & treatment of complication including: Fracture – disease, Volkmann’s ischaemic contracture, Sudeck’s Atrophy, Carpal Tunnel Syndrome. Myositis ossificans and shoulder – hand syndrome.
- vi) Fracture healing.

**2. Upper Limb Fractures & Dislocations:**

- a) Enumerate major long bone fractures and joint injuries.
- b) Briefly describe their clinical features, principles of management and complications.

**3. Lower Limb Fractures & Dislocations:**

- a) Enumerate major long bone fractures and joint injuries.
- b) Briefly describe their clinical features, principles of management and complication.

**4. Spinal Fractures and Dislocations:** Outline the mechanism, clinical features, principles of management and complications of spinal injuries.

**5. Recurrent Dislocations:** Outline the mechanism, clinical features, principles of management and complications of recurrent dislocation of the shoulder and patella.

**Section – III**

**1. Amputations:**

- a) Classify amputations. List indication for surgery,
- b) Outline pre-operative, operative and prosthetic management.
- c) Outline prevention and treatment of complications.

**2. Bone & Joint Infections:** Outline the etiology, clinical features, management and complications of septic arthritis osteomyelitis, Tuberculosis (including spinal T.B.).

**3. Bone Joint Tumors:** Classify and outline the clinical features, management and complications of the following (benign / malignant bone and joint tumors, osteomas, osteosarcomas, osteoclastomas, Ewing’s sarcoma, multiplemyeloma).

**Section – IV**

**1. Chronic Arthritis:** Outline of pathology: clinical features, mechanism of deformities, management and complications of Rheumatoid arthritis. Osteoarthritis of major joints and spine, Ankylosing spondylitis.

**2. Neck & Back Pain, Painful Arc Syndrome, Tendonitis, Facitis & Spasmodic Torticollis.** Outline the above including clinical features and management.

**3. Spinal Deformities:** Classify spinal deformities and outline the salient clinical features, management and complications of Scoliosis, Kyphosis and Lordosis.

**Section – V**

1. **Poliomyelitis:** Describe the pathology, microbiology, prevention, management and complications of polio. Outline the treatment of residual paralysis including use of orthoses. Principles of muscle transfers and corrective surgery.
2. **Congenital Deformities:** Outline the clinical features and management of CTEV, CDH, Flat foot, vertical talus, limb deficiency (radial club hand and femoral, tibial and fibula deficiencies meningomyelocele, Arthrogryphosis multiplex congenitiae and Osteogenesis imperfecta.
3. **Peripheral Nerve Injuries:** Outline the clinical features and management, including reconstructive surgery of:
  - a) Radial, Median and Ulnar Nerve Lesions.
  - b) Sciatic and Lateral Popliteal Lesions.
  - c) Brachial Plexus injuries including Erbs, Klumpke's and crutch palsy
4. **Hand Injuries:** Outline of clinical features, management and complications of: Skin and soft tissue injury, tendon injury, bone and joint injury.
5. **Leprosy:** Outline of clinical features, management and complications of neuritis, muscle paralysis, tropic ulceration and hand & feet deformities.

**Books Recommended:**

1. Watson – Zones, Fractures and Joint Injuries – Wilson – Churchill Livingstone.
2. Clinical Orthopaedic Examination – Mcrae – Churchill Livingstone.
3. Concise System of Orthopaedics and Fractures – Apley – Butterworth Heinmann.
4. Outline of Fractures – Adam – Churchill Livingstone.
5. Outline of Orthopaedics – Adam – Churchill Livingstone.
6. Physical Examination in Orthopaedics – Apley – Butterworth Heinmann.
7. Clinical Orthopaedics Diagnosis – Pandey & Pandey – Jaypee Brothers.

**BACHELOR OF PHYSIOTHERAPY (PART-III)**

**Paper – II General Medicine**

**Time: 3 Hrs.**

**M. Marks: 200**

**Theory: 80**

**Practical: 80**

**Internal Assessment: 40**

1. There will be Ten Questions of equal Marks distribution. Candidate will have to answer any eight questions.
2. The questions should be equally distributed in the whole syllabus.

**Section – I**

1. Introduction to modes of transfer of communicable diseases & general preventive measures.
2. **Bacterial Diseases:** Tuberculosis, Leprosy, Rheumatic fever, Tetanus, Typhoid fever, Diphtheria, Pneumonia, Bacillary Dysentery and Measles.
3. **Viral Diseases:** Herpes – simplex and zoster, Varicella, Measles, Mumps, Hepatitis B & C, AIDS & influenza.
4. **Metabolic and Deficiency Diseases:** Diabetes, Anemia, Vitamin & Nutritional Deficiency diseases, diseases of the endocrine glands.

**Section – II**

1. **Diseases of Respiratory System:** Asthma, Bronchitis, Massive collapse of lungs, Bronchiectasis Bronchial Pneumonia, lung abscess, Emphysema, Empyema, Paralysis of diaphragm & vocal cords, chronic infection of larynx and trachea, Abnormalities of trachea,



infarct of lungs, chronic passive congestion, chronic obstructive pulmonary disease, chest wall deformities.

2. **Diseases of Circulatory System:** Thrombosis, Embolism, Gangrene, Valvular diseases, Hemorrhage, Heart Malformation, various diseases of arteries, diseases of blood forming organs, Anemia, Leukaemia, Leucocytosis, Peripheral Vascular diseases, diseases of the lymphatic systems. Diseases of the heart – Hypertension, Hypotension, Aortic aneurysm, Endocarditis, Pericarditis, Aortic Regurgitation, Cardiac failure, coronary heart diseases, congenital heart malformation and its manifestation.

### **Section – III**

1. **Diseases of Digestive Systems:** Pharyngitis, spasm of the Oesophagus, Diverticulum stenosis, Gastric ulcer, Hematemesis, Pyloric stenosis, Dyspepsia, Vomiting, Diarrhoea, Duodenal ulcer etc.

2. **Disease of Liver:** Jaundice Cirrhosis of liver, Abscess of liver, Ascitis.

3. **Diseases of Kidney:** Polyuria, Hematuria, Uremia, Anuria, Nephritis, Urinary infections, Urinary calculi.

### **Section – IV**

#### **Diseases of Skin:**

1. Characteristics of normal skin, abnormal changes, types of skin lesions.

2. **Conditions** – Leprosy, Acne, Boil, Carbuncles, Impetigo, Infections of skin, Herpes, Urticaria, Psoriasis, Skin disorders associated with circulatory disturbances, Warts, Corn, Defects in Pigmentation, Psoriasis, Leucoderma, Fungal infections, Alopecia, Dermatitis, Eczema, Skin – allergies, Venereal diseases.

### **Section – V**

#### **Psychiatry:**

1. Introduction: Definition, defence mechanism, symptomatology, types & causes of mental disorders, psychosomatic disorders.

#### **2. Disorders:**

a) Psychosis – Schizophrenia (including paranoid), maniac depressive psychosis, involvement psychosis.

b) Psychoneurosis – Anxiety, hysteria, anxiety states, neurasthenia, reactive depression, obsessive compulsive neurosis.

c) Organic reaction to – toxins, trauma & infection.

d) Senile dementia.

3. **Mental retardation** – Definition, causes manifestation and management.

#### **4. Therapies:**

a) Psychotherapy – Group therapy, Psychodrama, behaviour modification, family therapy, play therapy, psychoanalysis, hypnosis.

b) Drug therapy

c) Electro convulsive therapy

**Books Recommended:**

1. Davidson's Principles and Practices of Medicine - Edward - Churchill Livingstone.
2. Hutchinson's Clinical Methods - Swash - Bailliere Tindall.
3. A Short Text Book of Medicine - Krishna Rao - Jaypee Brothers.
4. A Short Text Book of Psychiatry - Ahuja Niraj - Jaypee Brothers.

***BACHELOR OF PHYSIOTHERAPY (PART-III)***

**Paper – III Physiotherapy in Orthopaedic Conditions**

**Time: 3 Hrs.**

**M. Marks: 200**

**Theory: 80**

**Practical: 80**

**Internal Assessment: 40**

1. There will be Ten Questions of equal Marks distribution. Candidate will have to answer any eight questions.
2. The questions should be equally distributed in the whole syllabus.

**Section - I**

**Introduction** Brief review of the following surgical condition and various physiotherapeutic modalities, aims, means and technique of physiotherapy should be taught.

Traumatology General physiotherapeutic approach for the following conditions:

Fracture and dislocations; Classification and type of displacement, method of immobilisation, healing of fractures and factors affecting union, non union, delayed union etc. common sites of fractures.

Specific fractures and their complete physiotherapeutic management.

Upper Limb; Clavicle, humerus, ulna, radius, crush injuries of hand.

Lower Limb; fracture neck of femur, shaft of femur patella tibia fibula, pott's fracture, fracture of tarsal and metatarsals.

Spine; fracture and dislocations of cervical, thoracic and lumbar vertebrae with and without neurological deficits.

## **Section - II**

Surgical procedures; Pre and post operative management of common corrective procedure like arthroplasty, arthrodesis, osteotomy, tendon transplants, soft tissue release grafting, including polio residual paralysis and leprosy deformities corrections.

Injuries; Soft tissue injuries, synovitis, capsulitis, Volkmann's ischemic contracture etc. tear of semilunar cartilage and cruciate ligaments of knee, meniscectomy, patellectomy, internal derangement of knee.

Amputation; level of amputation of upper limb and lower limb, stump care, stump bandaging, pre and post prosthetic management including check out of prosthesis, training etc

Deformities; congenital torticollis and cervical rib, CTEV, Pes cavus, pes planus and other common deformities.

Acquired – Scoliosis, kyphosis, lordosis, coxa vara, genu valgum, genu varum and recurvatum.

## **Section - III**

Degenerative and infective conditions: osteoarthritis of major joints, spondylosis, spondylitis, spondylolisthesis, PIVD, Periarthritis of shoulder, Tuberculosis of spine, bone and major joint, Perthes disease. Rheumatoid arthritis, Ankylosing spondylitis etc. and other miscellaneous orthopaedic conditions treated by physiotherapy.

Principles of sports physiotherapy – causes of sports injury, prevention of sports injuries, management of acute sports injury, common occurred injuries. Role of physiotherapist in sports, principle & advanced rehabilitation of the injured athlete.

## **Practical**

**Marks: 80**

Various physiotherapy modalities and treatment techniques for the above mentioned conditions to be demonstrated and practiced by the students in clinical setup.

## **Books Recommended:**

1. Cash text book of Orthopaedics and Rheumatology for Physiotherapists – Downie - Jaypee Brothers.
2. Tidy's Physiotherapy - Thomson et al -Butterworth Heinmann.
3. Essentials of orthopaedics and applied physiotherapy – Joshi and Kotwal - B.L. Churchill Livingstone.
4. Tetraplegia & Paraplegia - Bromley - W.B. Saunders.
5. Orthopaedic Physiotherapy - Donatelli & Wooden - W.B. Saunders.
6. Rheumatological Physiotherapy - David - Mosby.
7. Orthopaedic Physiotherapy - Tids well - Mosby.
8. Physiotherapy for Amputee - Engstrom & Van de van - Churchill Livingstone.
9. Sports Injuries: Diagnosis and Management - Norris Butterworth Heinmann

***BACHELOR OF PHYSIOTHERAPY (PART-III)***

**Paper – IV Physiotherapy in Medical Condition-I**

**Time: 3 Hrs.**

**M. Marks: 200**

**Theory: 80**

**Practical: 80**

**Internal Assessment: 40**

1. There will be Ten Questions of equal Marks distribution. Candidate will have to answer any eight questions.
2. The questions should be equally distributed in the whole syllabus.

**Section – I**

**General Medicine**

Review of the Pathological and principles of management by Physiotherapy to the following conditions:

1. Inflammation – acute, chronic and suppurative.
2. Oedema – Traumatic, obstructive, Paralytic, Oedema due to poor muscle and laxity of the fascia.
3. Arthritis and Allied Conditions (in details):
  - a) Osteo – arthritis – generalised, Degenerative and traumatic, Spondylosis and disorders.
  - b) Rheumatoid Arthritis, Still's disease, infective Arthritis.
  - c) Spondylitis, Ankylosing Spondylitis.
  - d) Nonarticular Rheumatism – Fibrositis, Myalgia, bursitis, Periarthritis etc.
4. Common conditions of Skin – Acne, Psoriasis, Alopecia, Leucoderma, Leprosy, Sexually

transmitted diseases.

5. Deficiency diseases – Rickets, Diabetes, Obesity, Osteoporosis and other deficiency disorders related to Physiotherapy.

6. Psychiatric Disorders – Psychosis, Psychoneurosis, Senile dementia.

## **Section – II Respiratory**

1) Review of mechanism of normal respiration.

2) Chest examination, including auscultation, percussion.

3) Knowledge of various investigative procedures (invasive & noninvasive) used in the diagnosis of various respiratory disorders.

Review of pathological changes and principle of management by physiotherapy of the following conditions:

1) Bronchitis, Asthma, Lung abscess, Bronchiectasis, Emphysema, COPD.

2) Pleurisy and Empyema, Pneumonia.

3) Bacterial Disease.

4) Rheumatic fever, Carcinoma of respiratory tract.

5) Paralysis of diaphragm & vocal cords.

6) Chest wall deformities.

## **Section – III Cardiovascular**

1) Review of anatomy & physiology of the cardiovascular system.

2) Knowledge of various investigative procedures (invasive & noninvasive) used in the diagnosis of various cardiovascular disorders.

3) Review of pathological changes and principle of management by physiotherapy of the following conditions:

Thrombosis, Embolism, Buerger's diseases, Arteriosclerosis, Thrombophlebitis, Phlebitis, Gangrene, Congestive Cardiac failure. Hypertension, Hypotension, aneurysm.

### **Books Recommended:**

1. Cash Textbook of General Medical and Surgical Conditions for Physiotherapists – Downie - Jaypee Brothers.

2. Essentials of Cardiopulmonary Physical Therapy - Hillegass & Sadowsky - W.B. Saunders.

3. Cash Textbook of Chest, Heart and Vascular Disorders for Physiotherapists - Downie - J.P. Brothers.

4. The Brompton Guide to Chest Physical Therapy.

5. Cardiopulmonary Physical Therapy - Irwin and Tecklin - Mosby.

6. Cardiovascular / Respiratory Physiotherapy - Smith & Ball - Mosby.

7. ACSM Guidelines for Exercise Testing and Prescription - ACSM - Williams and Wilkins.

8. Chest Physiotherapy in Intensive Care Unit - Mackenzie et al - Williams and Wilkins

***BACHELOR OF PHYSIOTHERAPY (PART-III)***

**Paper – V Research Methodology and Biostatistics**

**Time: 3 Hrs.**

**M. Marks: 100**

**Theory: 80**

**Internal Assessment: 20**

1. There will be Ten Questions of equal Marks distribution. Candidate will have to answer any eight questions.
2. The questions should be equally distributed in the whole syllabus.

**Section – I**

1. Introduction: Importance of research in clinical practice, scientific approach, characteristics, Purposes and limitations.
2. Ethical issues in research, elements of informed consent.
3. Structure of a research proposal.

**Section – II**

1. Research Question including literature review.
2. Measurement: Principles of measurement, reliability and validity.
3. Experimental sampling and design.
4. Descriptive research.

**Section – III**

**Biostatistics:**

1. Descriptive statistics
2. Comparison of means, T – tests.
3. Analysis of Variance.
4. Qualitative and quantitative observations, Measures of Central Tendency – Arithmetic Mean,

Median and Mode, Position of averages. Graphical representation of data.

5. Measures of dispersion – range, variance, mean deviation, standard deviation and co eff. of variation.

Frequency distribution

6. Correlations

**Books Recommended:**

1. Methods in Biostatistics – Mahajan - J.P.

2. Statistics in Medicine - Colton - Little Brown, Boston.

3. Research for Physiotherapist: Project Design and Analysis - Hicks - Churchill Livingstone.

4. Biostatistics: The manual for Statistical methods for use in health and nutrition - K.V. Rao- J.P.

5. Research methods in Behavioural Sciences - Mohsin - Orient Publication

***BACHELOR OF PHYSIOTHERAPY (PART-III)***

**Paper – VI Neurology**

**Time: 3 Hrs.**

**M. Marks: 200**

**Theory: 80**

**Practical: 80**

**Internal Assessment: 40 (Th-20; Pr-20)**

1. There will be Ten Questions of equal Marks distribution. Candidate will have to answer any eight questions.

2. The questions should be equally distributed in the whole syllabus.

**Section – I**

1. **Neuroanatomy:** Review the basic anatomy of the brain and spinal cord including:

Blood supply of the brain and spinal cord, anatomy of the visual pathway, connections of the cerebellum and extrapyramidal system, relationship of the spinal nerves to the spinal cord segments, long tracts of the spinal cord, the brachial and lumbar plexus and cranial nerves.

2. **Neurophysiology:** Review in brief the Neurophysiological basis of: tone and disorders of the tone and posture, bladder control, muscle contraction, movement and pain.

3. Assessment and evaluative procedures for the neurological patient.

4. Review of the principles of the management of a neurological patient.

**Section – II**

Briefly outline the etiogenesis, clinical features and management of the following Neurological disorders: -

1. Congenital and childhood disorders – Cerebral palsy, Hydrocephalus and Spina Bifida.
2. Cerebrovascular accidents – General classification, thrombotic, embolic, haemorrhagic & inflammatory, strokes, gross localisation and sequelae.
3. Trauma – localization, first aid and management of sequelae of head injury and spinal cord injury.
4. Diseases of the spinal cord – Craniovertebral junction anomalies, Syringomyelia, Cervical and lumbar disc lesions, Tumors and Spinal arachnoiditis.
5. Demyelinating diseases (central and peripheral) – Guillain – Barre syndrome, Acute disseminated encephalomyelitis, Transverse myelitis and Multiple sclerosis

### **Section -III**

Briefly outline the etiogenesis, clinical features and management of the following Neurological disorders: -

1. Degenerative disorders – Parkinson’s disease and dementia.
2. Infections – Pyogenic Meningitis sequelae, Tuberculous infection of central nervous system and Poliomyelitis.
3. Diseases of the muscle – Classification, signs, symptoms, progression and management.
4. Peripheral nerve disorders – Peripheral nerve injuries, Entrapment neuropathies and Peripheral neuropathies.

### **Section – IV**

1. Epilepsy – Definition, classification and management.
2. Myasthenia Gravis - Definition, course and management.
3. Intracranial Tumors – Broad classifications, signs and symptoms.
4. Motor neuron disease - Definition, classification and management.
5. Cranial nerve – Types of Disorders, clinical manifestation & management.

### **Section – V**

1. Introduction to neuropsychology.
2. General assessment procedures and basic principles of management.

### **Books Recommended:**

1. Brain’s Diseases of the Nervous System - Nalton – ELBS.
2. Guided to clinical Neurology - Mohn & Gaectier - Churchill Livingstone.
3. Principles of Neurology - Victor – McGraw Hill International edition.
4. Davidson’s Principles and Practices of Medicine - Edward - Churchill Livingstone



***BACHELOR OF PHYSIOTHERAPY (PART-III)***

**Paper – VII Clinicals**

**M. Marks: 100**

**Practical: 80**

**Internal Assessment: 20**

**Section I: Case Presentation**

The students will have to present at least two case studies in the form of power point presentation.

**Section II: Clinical Posting**

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of case studies assessed by them daily throughout the session in a logbook.

***BACHELOR OF PHYSIOTHERAPY (PART-IV)***

**Paper – I General Surgery**

**Time: 3 Hrs.**

**M. Marks: 200**

**Theory: 80**

**Practical: 80**

**Internal Assessment: 40 (Th-20; Pr-20)**

1. There will be Ten Questions of equal Marks distribution. Candidate will have to answer any eight questions.
2. The questions should be equally distributed in the whole syllabus.

**Section – I**

1. Introduction to principles of surgery and its procedure.
2. Shock – definition, types, clinical feature, pathology & management.
3. Haemorrhage – common sites, complication, clinical features & management.
4. Blood Transfusion – Blood group matching, indication & complication.
5. Anaesthesia – Principles of anaesthesia, types & procedure.

**Section –II**

1. Wounds, Tissue repair, Classification – Acute Wounds, Chronic wounds, Scars & their Management.
2. Wound infections: - Psychology and manifestation, Types of infections & their Management.
3. Tumors and Ulcers: -

- a) Tumors – Types & Management.
- b) Ulcers – Types & Management.
4. Burns – Causes, Classification, Clinical features & Management.
5. Skin Grafting – Indications, Types & Procedures.
6. Hand Infections – Types & Management.
7. General Injuries – Types & Management.

### **Section – III**

1. Complications of Surgery.
2. Abdominal Surgery – Types of Incisions & common surgical procedures.
3. Thoracic and Cardiac Surgery – Types of incisions & common surgical procedures.

### **Section – IV**

#### **Obstetrics & Gynaecology:**

1. Pregnancy, stages of labour & its complications, indications & types of surgical procedures.
2. Gynaecological disorders – Salpingitis, parametritis, retro-uterus, prolapse of uterus, pelvic inflammatory diseases, urinary incontinence.

### **Section – V**

#### **Ophthalmology:**

1. Common inflammations and other infections of eye.
2. Ptosis
3. Blindness – common causes & management.
4. Refractions – testing, errors & remedies
5. Strabismus – types, features & corrective measures.

### **Section – VI**

#### **Ear, Nose & Throat (ENT)**

1. Introduction – Outline mechanism of audition, olfaction & speech.
2. Classify causes of hearing impairment, assessment techniques, conservative & surgical management.
3. Hearing Aids – types & indications.
4. Outline common ENT infections & lesions, which affect hearing, breathing, speech & their management.
5. Outline the function of vestibular organ, its common disorders & their management.

#### **Books Recommended:**

1. Baily and Love - Short Practice of Surgery - Mann and Rains - H.K. Levis Publications,

London.

2. Undergraduate Surgery - Nan - Academic Publishers, Calcutta.
3. Textbook of Surgery - Gupta R.L. - Jaypee.
4. Principles and Practices of Trauma Care - Kocher - Jaypee.
5. Clinical Methods - S. Das - Calcutta.

### ***BACHELOR OF PHYSIOTHERAPY (PART-IV)***

#### **PAPER-II: COMMUNITY PHYSIOTHERAPY & REHABILITATION**

**Time: 3 Hrs.**

**M. Marks: 200**

**Theory: 80**

**Practical: 80**

**Internal Assessment: 40 (Th-20; Pr-20)**

1. There will be Ten Questions of equal Marks distribution. Candidate will have to answer any eight questions.
2. The questions should be equally distributed in the whole syllabus.

#### **Unit-I**

- Surveillance, Monitoring & Screening in Occupational Health
- Types & purposes of work place health examination
- Ethical Issues in health examination in the work place
- Work Disability
- Definition
- Causes & Prevention
- Management

#### **Unit-II**

- Ergonomics & Work related Musculoskeletal disorders
- Fatigue
- Chronic work related musculoskeletal disorders
- Occupational low back pain

- Management of Work related Musculoskeletal disorders
- Role of physiotherapy in occupational disorders

### **Unit-III**

- Industrial Hygiene
- Recognition of Occupational & Environmental Hazards
- Hazard Evaluation
- Hazard Control

### **Unit-IV**

- Women's Occupational Health Problem
- Musculoskeletal disorders
- Stress

### **Unit-V**

- Community Obstetrics
- Social Obstetrics
- Maternal & Child Health
- Health indicators
- Goals of MCH services
- Role of Physiotherapy in women health related disorders

### **Unit-VI**

- Nutrition in Public Health & Preventive Medicine
- Nutritional deficiencies : Causes & Consequences
- Dietary Recommendations
- Nutritional disorders in women

### **Unit-VII**

- Family Planning Programs & Practices
- Goals
- Policies & Laws
- Effects
- Family Planning Problems in Public Health

### **Unit-VIII**

- Health Problems of the Aged due to
- Ageing
- Illness
- Psychological causes
- Physiotherapy approach to Geriatric Conditions

## **UNIT- IX**

- Legal issues in medico-legal action
- Consumer protection act
- Code of ethics, social and medical policy in Physiotherapy

### ***BACHELOR OF PHYSIOTHERAPY (PART-IV)***

#### **Paper – III Paediatrics & Geriatrics**

**Time: 3 Hrs.**

**M. Marks: 200**

**Theory: 80**

**Practical: 80**

**Internal Assessment: 40 (Th-20; Pr-20)**

1. There will be Ten Questions of equal Marks distribution. Candidate will have to answer any eight questions.
2. The questions should be equally distributed in the whole syllabus.

#### **Section – I Paediatrics:**

1. Review normal foetal development & child birth, including assessment of a neonate.
2. Development of a normal child – neuromotor, physical growth, cognitive, intellectual, social etc.
3. The examination & assessment of a pediatric patient.
4. Congenital & acquired musculo skeletal disorders – etiogenesis, clinical manifestation & principles of management.
5. Congenital & acquired Cardio - pulmonary disorders – etiogenesis, clinical manifestation & principles of management.
6. Congenital & acquired neurological disorders (CNS & PNS) – etiogenesis, clinical manifestation & principles of management.
7. Hereditary disorders - etiogenesis, clinical manifestation & principles of management.

8. Nutritional Vitamins Deficiency & Development Disorders – etiogenesis, clinical manifestation & principles of management.
9. Burns, Injuries & accident – Types & principles of management, including preventive care.
10. Surgical intervention – Indications & common surgical procedure.

## **Section – II**

### **Geriatrics:**

1. Normal aging – definition, the anatomical, physiological and cognitive changes related to aging.
2. Epidemiology and socio- economic impact of aging.
3. The examination & assessment of a geriatric patient.
4. Musculo skeletal disorders – etiogenesis, clinical manifestation & principles of management.
5. Cardio - pulmonary disorders – etiogenesis, clinical manifestation & principles of management.
6. Neurological disorders (CNS & PNS) – etiogenesis, clinical manifestation & principles of management.
7. Diet & Nutritional requirement of the elderly. Nutritional disorders & their management.
8. Burns, Injuries & accident as related to the elderly & preventive care.
9. Dementia – Types and principles of management.
10. Overview of depressive disorders in the elderly

### **Books Recommended:**

1. Nelson's Textbook of Paediatrics - Behrman & Vaughan - W.B. Saunders.
2. Textbook of Paediatrics - Parthasarthy - Jaypee.
3. The Short Textbook of Paediatrics - Gupte - Jaypee.
4. Geriatric Physical Therapy - Guccione - Mosby.
5. Motor Assessment of the Developing infant - Piper & Davrah - W.B. Saunders.

***BACHELOR OF PHYSIOTHERAPY (PART-IV)***

**Paper – IV Physiotherapy in Medical Conditions - II**

**Time: 3 Hrs.**

**M. Marks: 200**

**Theory: 80**

**Practical: 80**

**Internal Assessment: 40 (Th-20; Pr-20)**

1. There will be Ten Questions of equal Marks distribution. Candidate will have to answer any eight questions.
2. The questions should be equally distributed in the whole syllabus.

**Section-I**

**Theory**

**Neurology**

1. Examination of Neurological disorders and principles of treatment.
2. Knowledge of various investigative procedures (invasive & noninvasive) used in the diagnosis of various neurological disorders.
3. Review of pathological changes and principle of management by physiotherapy of the following conditions:
  - a) Hemiplegia, Paraplegia, Tabes dorsalis, cerebellar ataxia, extra pyramidal lesions, Gullian Barre Syndrome, Parkinsonism.
  - b) Disseminated sclerosis, Amyotrophic lateral sclerosis, Syringomyela subacute combined degeneration of cord motor neuron disease.
  - c) Peripheral Nerve and cranial Nerve lesions.
  - d) Neuritis and Neuralgia – Brachial, sciatic etc.
  - e) Infections – Poliomyelitis, meningitis, Encephalitis, Polyneuritis Transverse myelitis.



f) Traumatic head injuries and spinal cord injury.

## **Section – II**

### **Paediatrics**

A. Review of the examination & assessment of a Paediatric patient.

B. Review of pathological changes and principle of management by physiotherapy of the following conditions:

- 1) Common congenital & acquired musculo skeletal disorders.
- 2) Common congenital & acquired neurological disorders (CNS & PNS).
- 3) Common heredity disorders.
- 4) Common nutritional, metabolic & vitamin deficiency disorders.
- 5) Cerebral palsy, myopathy and muscular dystrophies.

## **Section – III**

### **Geriatrics**

A. Review of the examination & assessment of a Geriatric patient.

B. Review of pathological changes and principle of management by physiotherapy of the following conditions:

- 1) Musculo skeletal disorders.
- 2) Cardiopulmonary disorders.
- 3) Neurological disorders (CNS & PNS).
- 4) Injuries & accidents specific to the aged.

## **Section- IV**

### **Motor learning**

#### **i) Introduction to motor learning**

- a) Classification of motor skills.
- b) Measurement of motor performance.

#### **ii) Introduction to motor control**

- a) Theories of motor control.
- b) Applications.

#### **iii) Learning Environment**

- a) Learning of Skill.
- b) Instruction & augmented feedback.
- c) Practice conditions

## **Practical**

**Marks: 80**

Various Physiotherapy modalities and treatment techniques for above mentioned conditions should be demonstrated and practised by the students.

**Books Recommended:**

1. Cash's Textbook of Neurology for Physiotherapists - Downi - J.P. Brothers.
2. Adult Hemiplegia – Evaluation & Treatment - Bobath - Oxford Butterworth Heinmann.
3. Neurological Rehabilitation – Carr & Shepherd -Butterworth Heinmann.
4. Tetraplegia & Paraplegia – A Guide for Physiotherapist - Bromley - Churchill Livingstone.
5. Neurological Physiotherapy – A Problem Solving Approach - Susan Edwards - Churchill Livingstone.
6. Neurological Rehabilitation - Umpherd - Mosby.
7. Geriatric Physical Therapy - Gucciona - Mosby.
8. Motor Assessment of Developing Infant - Piper & Darrah - W.B, Saunders.
9. Paediatric Physical Therapy - Teckling - Lippincott.
10. Treatment of Cerebral Palsy and Motor Delay - Levitts - Blackwell Scientific Publications, London.
11. Aging the Health Care Challenge - Levis - F.A. Davis.
12. Physiotherapy in Paediatrics - Shepherd - Butterworth Heinmann
13. Motor Control: Theory and Practical Applications Shumway - Cook & Wallcott - Lippincott.

***BACHELOR OF PHYSIOTHERAPY (PART-IV)***

**Paper – V: Physiotherapy in Surgical Conditions**

**Time: 3 Hrs.**

**M. Marks: 200**

**Theory: 80**

**Practical: 80**

**Internal Assessment: 40 (Th-20; Pr-20)**

1. There will be Ten Questions of equal Marks distribution. Candidate will have to answer any eight questions.
2. The questions should be equally distributed in the whole syllabus.

**SECTION – I**

**Thoracic Surgery**

Review of pathological changes and principle of pre and post-operative management by physiotherapy of the following conditions:

- 1) Lobectomy, Pneumonectomy, Thoracotomy, Thoracoplasty, Endoscopy & eye hole surgeries.
- 2) Corrective surgeries of congenital heart defects, angioplasties, blood vessel grafting, open heart surgeries & heart transplant.

**SECTION – II**

**General, Gynaecology and Obsterics and ENT**

Review of pathological changes and principle of pre and post-operative management by physiotherapy of the following conditions:

- 1) Common abdominal surgeries, including GIT, liver, spleen, kidney, bladder etc.
- 2) Common operation of reproductive system, including surgical intervention for child delivery.

Ante natal & post natal, physiotherapy

- 3) Common operations of the ear, nose, throat & jaw as related to physiotherapy.
- 4) Common organ transplant surgeries – heart, liver, bone marrow etc.

### **SECTION – III**

#### **Wounds, Burns & Plastic Surgery**

Review of pathological changes and principle of pre and post-operative management by Physiotherapy of the following conditions:

- 1) Wounds, ulcers, pressure sores.
- 2) Burns & their complications.
- 3) Common reconstructive surgical proceedings of the management of wounds, ulcers, burns & consequent contractures & deformities.

### **SECTION – IV**

#### **Neurosurgery**

Review of pathological changes and principle of pre and post-operative management by physiotherapy of the following conditions:

- 1) Common surgeries of the cranium & brain.
- 2) Common surgeries of vertebral column & spinal cord.
- 3) Common surgeries of peripheral nerves.
- 4) Surgical interventions in traumatic head injuries.

### **SECTION – V**

#### **ICU (Intensive Care Unit) and Ventilation**

- 1) Intensive Therapy – Clinical Management
- 2) Intensive Therapy – Apparatus (Ventilations, Tubes, Humidifiers etc.)
- 3) Intensive Therapy – Adult Patient
- 4) Paediatric & Neonatal Intensive Therapy

#### **Books Recommended:**

1. Cash Textbook of general medical and surgical conditions for physiotherapists – Downie – Jaypee Brothers.
2. Cash textbook of heart, chest and vascular disorders for physiotherapists – Downie – Jaypee Brothers.
3. Principles and practices of cardiopulmonary physical therapy – Frown Felter – Mosby.
4. Chest physiotherapy in intensive care unit – Mackenzie – Williams & Wilkins.
5. Restoration of Motor Functions in stroke patient: A Physiotherapist Approach – Johnstone – Churchill Livingstone.

6. Physiotherapy in obstetrics and gynaecology – Polden – F.A. Davis

***BACHELOR OF PHYSIOTHERAPY (PART-IV)***

**Paper – VI: Rehabilitation, Organization and Administration**

**Time: 3 Hrs.**

**M. Marks: 100**

**Theory: 80**

**Internal Assessment: 20**

1. There will be Ten Questions of equal Marks distribution. Candidate will have to answer any eight questions.
2. The questions should be equally distributed in the whole syllabus.

**SECTION – I**

1. Conceptual framework of rehabilitation, roles of rehabilitation team members, definitions and various models of rehabilitation
2. Epidemiology of disability with emphasis on locomotor disability, its implications – individual, family, Social, economic and the state.
3. Preventive aspects of disability and organizational skills to manage it.
4. Community Based Rehabilitation and outreach programmes to rehabilitate persons with disabilities living in rural areas.
5. Statutory provisions, Schemes of assistance to persons with disability.
6. Role of N.G.Os in rehabilitation of the persons with disabilities.
7. Basic principles of administration and finance including personnel management and budget preparation and procurement etc.

**SECTION – II**

1. Principles of Orthotics – types, indications, contra-indications, assessment (check out), uses and fitting – region wise.
2. Fabrication of simple splints and self help devices for upper and lower extremity – indications and application.
3. Principles of Prosthetics – types, indications, contra-indications, assessment (check out), uses and fitting – upper and lower extremity.

### **SECTION – III**

1. Principles and mechanisms of Communication including speech and hearing.
2. Common disorders of speech and hearing – etiogenesis, clinical features, assessment and principles of management.
3. Principles in the management of vocational problems, including evaluation and vocational goals for people with disability.
4. Principles of rehabilitation Nursing, including function of Nursing personnel and Nursing practice in rehabilitation.

### **SECTION – IV**

1. Identification, assessment and classification of mentally subnormal.
2. Etiogenesis and principles of management including prevention.
3. Rehabilitation of the mentally subnormal, including vocational training & a home education programme.

### **SECTION – V**

1. Definition, scope & importance of Activities of Daily Living (ADLs).
2. The teaching and training of (a) wheel chair activities, (b) bed activities (c) transfer activities (d) Locomotor activities (e) self care activities, such as toilet, eating, dressing etc.
3. Principles of occupational therapy including evaluation and goals for people with disability.

#### **Books Recommended:**

1. Physical Rehabilitation – assessment & Treatment – Sullivan & Schmitz – F.A. Davis.
2. Occupational Therapy and Physical dysfunction: Principles, Skills & Practices – Turner, Foster & Johnson – Churchill Livingstone.
3. Hand Splitting – Wilson – W.B. Saunders.
4. Orthotics in Rehabilitation: Splinting the hand and the body – Mckee & Morgan – F.A. Davis.
5. Atlas of Limb Prosthetics – American Academy of Orthopaedic Surgeon – Mosby.
6. Atlas of Orthotics – American Academy of Orthopaedic Surgeon – Mosby.
7. Krusen's Handbook of Physical Medicine & Rehabilitation – Kottke & Lehmann – W.B. Saunders.
8. Willard and Spackman's occupational therapy – Neistadt & Crepeau – Lippincott

***BACHELOR OF PHYSIOTHERAPY (PART-IV)***

**Paper – VII Practical: Computer Applications**

**M.Marks:50**

**Practical Marks: 40**

**Internal Assessment: 10**

**Note: Only Practical examination will be conducted for this paper.**

- To study the various components of a personal computer.
- To have working knowledge of hardware and software.
- To practice the operational skills of common computer applications, including word processing & spreadsheet software.
- To have a basic knowledge of utility of multi-media.

**To learn skills of web surfing–For literature, researches relevant to the field of medicine**

***BACHELOR OF PHYSIOTHERAPY (PART-IV)***

**Paper – VIII Clinicals**

**M. Marks: 100**

**Practical: 80**

**Internal Assessment: 20**

**Section I: Case Presentation**

The students will have to present at least two case studies in the form of power point presentation.

**Section II: Clinical Posting**

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of case studies assessed by them daily throughout the session in a logbook.



## ***BACHELOR OF PHYSIOTHERAPY (PART-IV)***

### **BPT-IV (Practical Schedule)**

**General Surgery** – Practical including evaluation, clinical diagnosis and treatment for the condition covered in general surgery.

**Community Physiotherapy & Rehabilitation:** Practical includes community work based on different work places.

**Neurology**-Practical including evaluation, clinical diagnosis and treatment for the conditions covered in neurology.

**Paediatrics & Geriatrics**- Practical including evaluation, clinical diagnosis and treatment for the conditions covered in Paediatrics & Geriatrics.

**Physiotherapy in Medical Conditions (II)**- Practical for the evaluation, diagnosis and treatment for the various medical conditions including the physiotherapeutic approaches and the use of various modalities.

**Physiotherapy in surgical Conditions**- Practical for the evaluation, diagnosis and treatment for the various surgical conditions including the physiotherapeutic approaches and the use of various modalities.

**Computer Applications:** Practical examination covering the various components of computers, hardware and software knowledge, common computer applications, multimedia, utility and the skills of web surfing.

## **Internship**

1) The students require to undergo six months compulsory internship training after they have successfully completed and passed the final examination of BPT-4<sup>th</sup> year. It is mandatory for the students to cover all the clinical branches concerned with physiotherapy at multispecialty hospitals providing extensive exposure of the following fields:

- Neurology – Neurology IN patient, Neurosurgery, NS-ICU
- Orthopedics and Trauma Ward
- Cardiothoracic and Intensive care unit
- Respiratory Care Unit
- Pediatrics Unit
- Gynaecology Unit
- Burns & Plastic Surgery Unit

2) Students undergoing internship will have to prepare an internship project during the internship training and will submit the same at the end of the training as a mandatory requirement for the degree of BPT.