Dr. D. Y. PATIL VIDYAPEETH, PUNE
(DEEMED UNIVERSITY)

Syllabus
for
Bachelor of Physiotherapy
(BPT)

2014-15
DPU
Dr. D. Y. PATIL VIDYAPEETH, PUNE
(DEEMED UNIVERSITY)

2nd Year
(BPT)
## II Year – BPT

### Subjects –

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<td>1. Pathology and Microbiology</td>
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<td>A. Pathology</td>
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<td>B. Microbiology</td>
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<td>2. Pharmacology</td>
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<td>3. Exercise therapy II</td>
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<td>4. Electrotherapy II</td>
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<td>5. Psychology and Sociology</td>
<td>50 hrs</td>
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<td>6. Biomechanics</td>
<td>95 hrs</td>
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<td>7. Supervised Clinical practice</td>
<td>640 hrs</td>
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(To practice clinical skills under the supervision of Senior clinical staff at the O.P.D. set up & to maintain a Register/Log book - in which the prescribed Case Histories & written assignments are to be documented & to obtain the signature from the respective section In-charge at the end of the assignment.)
1. PATHOLOGY AND MICROBIOLOGY

A - PATHOLOGY

(Didactic – 50 Hrs)

Objectives -
At the end of the course, the student will be able to -

1) Acquire the knowledge of concepts of cell injury & changes produced thereby in different tissues & organs - capacity of the body in healing process.

2) Recall the Eti – pathogenesis, the pathological effects & the clinico – pathological correlation of common infections & non-infectious diseases.

3) Acquire the knowledge of concepts of Neoplasia with reference to the Etiology, gross & microscopic features, diagnosis & prognosis in different tissues & organs of the body.

4) Correlate normal & altered morphology of different organ systems in different diseases needed for understanding disease process & their clinical significance (with special emphasis to Neuro- Musculo-skeletal & cardio-respiratory systems).

5) Acquire knowledge of common Immunological disorders & their resultant effects on the human body.

6) Understand in brief, about the Hematological diseases & investigations necessary to diagnose them & determine their prognosis.

Syllabus :-

Must Know

1) Cell injury -
   a) causes, mechanism & toxic injuries with special reference to Physical, Chemical, & ionizing radiation.
   b) Reversible injury (degeneration)-types-morphology, swelling, hyaline, fatty changes.
   c) Intra-cellular accumulation-hyaline mucin & pigment disorders.
   d) Irreversible cell injury-types of necrosis-apoptosis
   e) Extra-cellular accumulation- amyloidosis, calcification — metastasis, & dystrophic – Pathogenesis, morphology
2) Inflammation & Repair: - 4 hrs.
   a) Acute inflammation – features, causes, vascular & cellular events,
   b) Morphologic variations,
   c) Inflammatory cells & mediators,
   d) Chronic inflammation:-causes, types, non- specific & granulomatous – with examples
   e) Wound healing by primary &secondary union factors promoting & delaying healing process.
   f) Healing at various sites - including-bones, nerve & muscle
   g) Regeneration & repair

3) Immuno – pathology – (basic concepts)- 2 hrs.
   a) Immune system:-organization-cells-antibodies -regulation of immune responses,
   b) Hyper-sensitivity,
   c) Secondary immuno-deficiency including HIV,
   d) Organ transplantation

4) Circulatory disturbances- 4 hrs.
   a) Edema -pathogenesis -types -transudates /exudates,
   b) Chronic venous congestion-lung, lever, spleen,
   c) Thrombosis – Mechanism and Morphology
   d) Embolism – types-clinical effects,
   e) Infarction – types – common sites
   f) Gangrenes – types – etiopathogenesis
   g) Shock – Pathogenesis, types, morphologic changes

5) Growth Disturbance- 4 hrs.
   a) Atrophy-malformation, agenesis, dysplasia,
   b) Neoplasia classification, histogenesis, biologic behavior, difference between benign & malignant tumour
   c) Malignant neoplasms -grades-stages-local & distal spread,
   d) Precancerous lesions & ca in situ
   e) Tumor & host interactions – systemic effects-metastatic or direct spread of tumors affecting bones, spinal cord, leading to paraplegia, etc.
6) **Cardiovascular system**  
4hrs.  
  a) Atherosclerosis - Ischemic heart diseases – myocardial infarction – Pathogenesis / Pathology  
  b) Hypertension  
  c) Congestive Cardiac Failure, Pericarditis, Cardiomyopathy  
  d) Rheumatic Heart Disease, Infective endocarditis  
  e) Peripheral vascular diseases  

7) **Respiratory system**  
4 hrs.  
  a) COPD,  
  b) Pneumonia (lobar, broncho, viral),  
  c) T.B. Primary, secondary – morphologic types,  
  d) Pleuritis, complications,  
  e) Lung collapse - atelectasis  

8) **Neuropathology**  
3 hrs.  
  a) Reaction of nervous tissue to injury – infection & ischemia  
  b) Pyogenic meningitis, TBM, Viral  
  c) Cerebrovascular disease, atherosclerosis, Thrombosis, embolism, aneurysm, hypoxia, infarction & hemorrhage.  
  d) Effects of Hypotension on CNS  
  e) Coma  
  f) Poliomyelitis, Leprosy, Demyelinating diseases, Parkinsonism, Cerebral palsy, metachromatic leucodystrophy, Dementia, Hemiplegia, paraplegia, Wilson’s disease  
  g) Space Occupying Lesions (SOL) - (in brief)  
  h) Peripheral nerve injury  

9) **Diseases of muscle**  
1 hr.  
  a) Muscular dystrophy, hypertrophy, Pseudo, hypertrophy, atrophy, Myositis ossificans, necrosis, regeneration, Myotonia, Muscle biopsy.  

10) **Neuromuscular junction**  
1 hr.  
  a) Myasthenia gravis, Myasthenic syndrome, Nerve biopsy.
11) Bone & Joints: 2 hrs.
   a) fracture healing, Osteomyelitis, rickets, Osteomalacia, Bone Tumors, Osteoporosis, Spondylosis, Prolapse Interverbral Disc, Scoliosis, Haemarthrosis, Gout, T.B., Arthritis – degenerative, inflammatory, RA, Ankylosing spondylitis, Tenosynovitis.

12) Clinical pathology – (including Demonstrations) 2 hrs.
   i) Lab investigation in liver & renal failure

13) Haematology 5 hrs.
   i) T.C./D.C./PBS, Eosinophilia, E.S.R., Anaemia
   ii) Bleeding and coagulation disorders
   iii) Disorders of haemoglobin structure and synthesis
   iv) Lymphoid and myeloid neoplasmas.

Desirable to Know: - 3 hrs.
   1) Growth Disturbance - Carcinogenesis – environmental carcinogens
   2) Endocrine – Hyperthyroidism – Diabetes
   3) Hepatic diseases – Cirrhosis – emphasis to systemic effects of portal Hypertension.

Nice to Know: - 6 hrs.
   1) Deficiency disorders – Vitamins A, B, C, D.
   2) Growth Disturbance - Chemical, Occupational, heredity, viral.
   3) Medical Genetics – (In Brief)
   5) G.I. system - Gastric/duodenal ulcer, enteric fever, TB, enteritis, Gastritis (Related to consumption of NSAID)
   6) Skin - Melanin pigment disorders, Vitiligo, Tenia versicolor, Psoriasis, Bacterial / fungal infections, cutaneous TB, Scleroderma, SLE, Leprosy, Alopecia, Skin Biopsy.
TEXT BOOKS –
1. Text book of Pathology -by Harsh Mohan
2. Pathologic basis of disease by Cotran, Kumar, Robbins
4. General Pathology – by Bhende

B - MICROBIOLOGY (Didactic – 30 Hrs)

Objectives: At the end of the course, the candidate will have sound knowledge of the agents responsible for causing human infections, pertaining to C.N.S., C.V.S. Musculoskeletal & Respiratory system.

Syllabus: -
Must know -
1] General Microbiology - Introduction & scope 1 hr

2] Classification of Micro - organisms & morphology of Bacteria 1 hr
   a) Bacterial cell, its organelles Gram and Ziehl - Neelson and its Importance in lab diagnosis.

3] A] Sterilization & disinfection [basic concepts] 2 hrs
   Must know -
   a) Definition of Sterilization, Disinfection, Enumeration of physical methods of sterilization including principles and their applications, commonly used Disinfectants.

Desirable to know: -
   a) Central sterile department (CSSD) concept only.

B] Hospital Acquired Infection 1 hr
   Must know –
   a) Definition, factor influencing infection, mode of transmission & prevention of MAI.

Desirable to know: -
   a) Infection control committee.
C] Universal safety precautions 1 hr.
Must know:
  a) Universal safety precautions, definition of waste classification, segregation
     Transport & disposal.

4] Immunology 5 hrs
Must know:
  a) Definition. Types of Immunity active & passive, local Immunity vaccines.
  b) Antigen antibody reaction – Definition of Antigen & antibody, Types and property & application for diagnosis.
  c) Immune response –
     Must Know – Type of cells involved Ag processing & presentation Primary & secondary immune response. CMI –
     Definition, role of T. cells and macrophages.
     Desirable to know – Principles & uses of monoclonal Abs.
  d) Hypersensitivity & auto-immunity -
    Must know - Definition, Classification Anaphylaxis – mechanism Manifestations & tests for Anaphylaxis, definitions of autoimmunity Classification & Mechanism.

5] Laboratory diagnosis of Infection 3 hrs.
  a) Host parasite relationship & bacterial infections.
     Must know – Different sources and modes of transmission of infection, microbial factors leading to establishment of infection.
  b) Methods of identification of bacteria -
     Must know – Principle of laboratory diagnosis of infectious diseases, General procedure for collection.
  c) Diagnosis of infectious diseases.
     Must know – Transport and processing of specimen for microbial diagnosis.

6] Bacteriology 7 hrs
  a) Infection caused by GM + ve & GM – Vecocci
     Must know – Morphology, pathogenicity & lab diagnosis of Staphylococci, Streptococci & Neisseria.
     Desirable to know – Role of Staphylococci in hospital infection.
b) Infection caused by GM +ve bacillus –
   **Must know** – Morphology, pathogenicity & lab diagnosis of Coryne bacterium diphtheria, Clostridium Perfringens & clostridium tetani.

c) Infection caused by Gram –ve bacilli –
   **Must know** – Morphology, pathogenicity & lab diagnosis of E. coli, Klebsiella, Pseudomonas, Shigella, Salmonella, V. Cholera.
   **Desirable to know** – Role of Pseudomonas in HAI.

d) Infection caused by Mycobacteria –
   **Must know** - Morphology, pathogenicity & lab diagnosis of M. tuberculosis, M leprae & atypical Mycobacteria.

e) Spirochaetes –
   **Must know** - Morphology, pathogenicity & lab diagnosis of Treponema Pallidum (VDRL test & TPHA)
   **Desirable to know** – Leptospira Borrelia.

7) Viruses 3 hrs

a) Introduction & General properties of viruses –
   **Must know** – Size, shape, symmetry, Structure of viruses, classification, cultivation of Viruses & methods for diagnosis of viral infections.

b) HIV -
   **Must know** – Morphology transmission clinical syndromes, Laboratory diagnosis & Prevention.

c) Hepatitis -
   **Must know** – List of viruses causing Hepatitis, pathogenicity, Laboratory diagnosis & Prevention.

d) Polio, measles, congenital, Viral infection, Rubella, CMV, Herpes -
   **Must know** – Clinical syndrome & Laboratory diagnosis.

8] Mycology 1 hr

**Must know** –
Morphological classification & general lab Diagnosis, Definition, causative Agents & lab Diagnosis of mycetoma, Pathogenicity & lab diagnosis of Aspergillosis & Candidiasis.
9] Parasites affecting CNS     2 hrs
Must know – List of parasites affecting CNS, on short about
lab diagnosis of malaria, Filarial, Toxoplasma, Cysticercosis,
echinococcus.

10) Applied Microbiology      3 hrs.
a) Diseases affecting bones, joints & muscles -
   Must know – Osteomyelities – etiology, lab diagnosis,
   Arthritis.
b) Disease involving brain & nerves -
   Must know – Meningitis, brain abscess is Infective
   neuritis, etiology & clinical manifestations & lab diagnosis.
c) Diseases involving cardiopulmonary system, skin & burns -
   Must know – Infective Carditis PUO, URTL, LRTI, Skin
   & burn Infections etiology Laboratory Diagnosis.

TEXT BOOKS
Textbooks of Microbiology – by R. Ananthnarayan & C. K. Jayram
Panikar

SCHEME OF EXAMINATION (THEORY ONLY)

#-Pathology – 50 marks +Microbiology – 30 marks =80 marks +I.A.–
20 marks = Total 100 marks
There shall be NO L A.Q’s in this paper
#Emphasis to be given to topics related to Musculo Skeletal /
Neurological / Cardiovascular / Respiratory conditions & Wound /
Ulcers /
Section A - M. C. Q. based on Single best answer in MUST KNOW
area time 30 mins.
Q-1 Based on Pathology [1 x 20] -----------------------------20 marks
Q-2 Based on Microbiology [1 x 10] ---------------------------10 marks

Section B - S. A. Q. based on Pathology
Q-3 Answer Any FIVE out of Six [5 x 3] ------------------------15 marks
Q-4 Answer any THREE out of Four [3 x 5] -------------------15 marks

Section C - S. A. Q. based on Microbiology
Q-5 Answer any FOUR out of Five [4 x 5] ---------------------20 marks
INTERNAL ASSESSMENT
Two exams – terminal and prelim of 80 marks each – Total 160 marks same as the university examination pattern.
Internal Assessment to be calculated out of 20 marks

2. PHARMACOLOGY
[DIDACTIC – 50 hrs]

Objectives:
At the end of the course the candidate will be able to –
1] Describe Pharmacological effects of commonly used drugs by patients referred for Physiotherapy, list their adverse reactions, precautions to be taken & contraindications, Formulation & route of administration.
2] Identify whether the pharmacological effect of the drug interferes with the Therapeutic response of Physiotherapy & vice-versa
3] Indicate the use of analgesics & anti-inflammatory agents with movement disorders with consideration of cost, efficiency & safety for individual needs.
4] Get the awareness of other essential &commonly used drugs by patients-The bases for their use & common as well as serious adverse reactions.

Syllabus:
A] Must know – Topic 1 and Drugs described in topics 2 to 9.
B] Desirable to Know – Major groups of drugs described in topics 10, 11.

TOPICS –
1) General Pharmacology 7 hrs.
   a) Introduction to pharmacology, drug development.
   b) Routes of Administration.
   c) Pharmaco-kinetics - Absorption and distribution of drugs.
   f) Adverse drug reactions.
   g) Factors modifying drug action.
2) Drugs acting on Central Nervous System 8 hrs.
   a) Alcohol
   b) Sedatives and Hypnotics
   c) Anti-epileptic drugs
   d) General Anaesthetics
   e) Opioid Analgesics
   f) NSAIDS
   g) Antipyretics
   h) Anti-psychotics, Antidepressants
   i) Drug Therapy in Parkinsonism

3) Drugs acting on Peripheral Nervous System 2 hrs.
   a) Skeletal muscle relaxants.
   b) Local Anaesthetics.

4) Drugs acting on CVS and blood 6 hrs.
   a) Anti-hypertensives, B blockers, Ca channel ACEI
   b) Treatment of Angina
   c) Treatment of Congestive cardiac failure
   d) Haematinics and erythropoietin
   e) Drugs affecting coagulation, bleeding, thrombosis.
   f) Treatment of Shock.

5) Drugs acting on Respiratory system 2 hrs
   a) For upper respiratory tract infections, Sinusitis – cough, laryngitis, Pharyngitis.
   b) Drugs for treatment of bronchial asthma, COPD

6) Drugs acting on Autonomic Nervous System 6 hrs.
   a) Introduction to ANS and Cholinergic agonists – I
   b) Cholinergic agonists – II
   c) Cholinergic antagonists
   d) Adrenergic agonists – I
   e) Adrenergic agonists – II
   f) Adrenergic antagonists

7) Endocrinology 4 hrs.
   a) Introduction to Endocrinology, Thyroid hormones and Antithyroid drugs.
   b) Treatments of diabetes mellitus.
c) Corticosteroids

d) Oestrogen and Progesterone

8) Drugs acting on Kidney  
   a) Diuretics

9) Chemotherapy  
   a) General principles of chemotherapy.
   b) Sulfonamides & Fluoroquinolones.
   c) Beta – Lactam antibiotics – I (Penicillins)
   d) Beta – Lactam antibiotics – II (Cephalosporins)
   e) Macrolides & aminoglycides
   f) Tetracyclines & chloramphenicol (Broad spectrum antibiotics)
   g) Anti-Tuberculosis drugs
   h) Anti –Leprosy drugs

10) Drugs used in Gastrointestinal Disorders  
   a) Peptic Ulcer
   b) Antiemetics
   c) Laxatives
   d) Antidiarrhoeal drugs

11) Miscellaneous Topics  
   a) Vaccines & Sera
   b) Dermatological – Scabies – Psoriasis – Local Antifungals
   c) Vitamins & Calcium Metabolism, Phosphorus, magnesium

TEXT BOOKS –
1) Essentials of Medical Pharmacology – K. D. Tripathi
2) Pharmacology and Pharmaco therapeutics – R.S. Satoskar
3) Pharmacology by Gaddum
4) Medical Pharmacology by Drill
5) Pharmacology principle of Medical practice – by Krantx & Carr
6) Pharmacological basis of Therapeutics – by Goodman, L.S. Gilman A.
SCHEME OF EXAMINATION –
[Theory – 40 marks + Internal assessment – 10 marks]
[There shall be No L. A. Qs in this paper]
Section Q-1, M. C. Q.-based on single best answer in MUST KNOW area
10 marks

*Section – B- Q-2-S.A.Q – Answer any FIVE out of six [5 X 3]
15 marks

Q-3-S.A.Q. – Answer any THREE out of four [3 x 5]
15 marks

- Emphasis should be given to the drugs related to Musculo-skeletal/Psycho-Neurological/Cardio-Vascular/Respiratory conditions/analgesics & anti-inflammatory conditions

INTERNAL ASSESSMENT –
Two papers – terminal and prelim examination of 40 marks each.
TOTAL 80 MARKS
Internal Assessment to be calculated out of 10 marks

3. EXERCISE THERAPY II

Total hours =205 Hours. (Didactic – 95hrs + Practical / laboratory – 110hrs)

Objective: –
At the end of the course, the candidate will be able to –
2. Describe the Biophysical properties of connective tissue, effect of mechanical loading, factors influencing the Muscle strength, mobility of articular & peri-articular soft tissues.
3. Describe the physiological & Therapeutic uses, merits /demerits of various exercise modes.
4. Demonstrate various therapeutic exercises on self & acquire the application skill on models.
5. Acquire the skill of assessment of isolated & group muscle strength, & Range of motion of the joints subjectively & objectively.
6. Describe the pattern of normal and abnormal movements of various joints and activities.

Syllabus:
1. Principle, classification, techniques, physiological & therapeutic effects, indications & contraindications of therapeutic exercises. (3 Hrs)

2. Muscle Strength  (Theory- 14 Hrs, Practical – 12 Hrs=26)
Must know –
   a) Assessment of muscle strength, [group/individual] subjective & objective methods 1/10 RM - dynamometry
   b) Factors that influence the strength, hypertrophy, recruitment of motor units, change after training /type of contraction - Isometric / Isotonic / Isokinetic / Eccentric.
   c) General principles of strength training: - overload / intensity / Motivation / learning / duration / frequency / reversibility / specificity.

   (Theory- 15 Hrs, Practical – 10 Hrs= 25)
Must know –
4. **Posture**  
*(Theory- 08 Hrs, Practical – 04 Hrs=12)*  
**Must know** –  
   a) Normal Posture – Overview of the mechanism of normal posture.  
   b) Abnormal Posture – Assessment, Types, etiogenesis, management, including therapeutic exercises.  
   c) Methods of Assessment of the Posture – Sitting /standing /Lying /Physiological, Deviations of the posture  
   d) Methods of assessment – Sagittal & frontal plane with plumpline & postural frame, by spondylometer, retraining after assessment.  
   e) Mobility evaluation of joint / muscles & its implication on posture.  
   f) Static and Dynamic Balance – Assessment & management including therapeutic exercises.

5. **Gait**  
*(Theory- 08 Hrs, Practical – 12 Hrs=20)*  
Overview of normal gait & its components.  
Gait deviations - Assessment, Types, etiogenesis, management, including therapeutic exercises  
Methods of assessment of Gait-measurements for walking aids  
Types of walking aids: (axillary /elbow crutches, walking sticks) indications, effects & various training techniques  
Crutch gaits, Crutch muscle, Pre – crutch training – on bed, parallel Bar, off Bed, crutch hold / balance.  
Training for different conditions (Paraplegia, Hemiparesis, Amputation, etc.)

6. **Co-ordination & Balance**  
*(Theory- 6 Hrs, Practical – 07 Hrs=13)*  
**Must know** –  
Principles, Technique, Neural control, Methods of co-ordination exercises, Frenkel’s exercises  
Differentiate types of co-ordination loss & balance loss.  
Physiology of inco-ordination, Balance loss & training.
7. **Principles of P.N.F.**  
   (Theory- 06 Hrs, Practical – 04 Hrs=10)  
   **Must know –**  
   Theory, Principles  
   Patterns of P.N.F.  
   Techniques of P.N.F.  

8. **Breathing exercises**  
   (Theory- 07Hrs, Practical – 08  Hrs=15)  
   **Must know –**  
   Goals –Inspiratory – Expiratory /Segmental  
   Forced Expiratory – coughing – huffing /Modified Inspiratory  
   /Active cycle of breathing.  
   Indication & its importance for patients.  
   Physiology of the above mentioned techniques.  

9. **Bronchial Hygiene**  
   (Theory- 06Hrs, Practical – 10 Hrs=16)  
   **Must know –**  
   Postural drainage position / Autogenic drainage.  
   Humidification  

10. **Principles of Home programme & Ergonomic advice**  
    (Theory- 05 Hrs, Practical – 02 Hrs=07)  

11. **Functional Re-education**  
    (Theory- 15 Hrs, Practical – 12 Hrs=27)  
    **Must know -**  
    a] Functional motor skills, -Motor skills to function independently in ADL  
    b] Mobility, Bed /Wheel chair mobility, ambulation training  
       Practical application on – Hemiplegia, Paraplegia, General Weakness.  
    c] Application of mat exercises [to practice on self & on models]
12. 6 Minute walk test – on models (with interpretations)  
   (Theory- 2 Hrs, Practical – 4 Hrs=6)  
   
   Must know –  
   Procedure, Data recording and data Interpretation, Indications & contra indication & practical execution.–  
   Risk factors and care to be taken during the test.  
   Other tests similar to this (3min. walk test, 12 min walk test)

13. SUPERVISED LABORATORY TRAINING = 25 Hours

Practical training should be emphasised for topics under - no.2a, 3b, 4, 5, 6, 8, 9, 11, 12,

TEXT BOOKS

1. Progressive resisted exercises – by Margaret Hollis,
2. Therapeutic Exercise by Carolyn Kisner
3. Joint Structure & Function by Cynthia Norkins
4. PNF – Knott and Voss
5. Principles of Exercise therapy – Dena M. Gardiner

REFERENCE BOOKS

1. Therapeutic exercise by Basmijian& Wolf.
2. Muscle testing by Daniel Kendall
3. Clinical evaluation – Lacote (for isolated assessment of abdominal muscles)
4. Muscle stretching & Auto stretching – Olaf Evjenth
5. Orthopaedic Evaluation – Magee (only for assessment of posture)

SCHEME OF EXAMINATION

Theory – 80 marks + Internal assessment 20 marks,----Total 100 marks  
Practical /laboratory – 80 marks,+ I.A.20 marks --------Total 100 marks
THEORY---Model question paper

Section A
Q-1]-M.C.Q. Based on Single best answer – MUST KNOW area – 20marks

Section B
SAQ - Q-2] Answer any FIVE out of six [5 x 3 ] ---------------15 marks
Q-3] Answer any THREE out of Four [ 3 x 5 ] ------------15 marks

*Section –C
L.A.Q.– Q-4] [Compulsory ] Based on Muscle strength/ mobility
15 marks

Q-5] Therapeutic application for Posture / Gait ------15 marks

OR
Q-5] Therapeutic application for Pulmonary function
15 marks

*[LAQ should give Break up of 15 marks – e.g. [3+5+7 ] etc ]

PRACTICAL
A. Long case – (35 marks)
1. Muscle training ( Testing & strengthening)
2. Mobility ( Passive, Active, Active Assisted, Mobilization of Peripheral joints , stretching )
3. Pulmonary function training
   a. Breathing exercises
   b. Bronchial hygiene technique
4. Co-ordination training
5. Crutch training & assisted ambulatory training

B. Two Short Case:- (20 X 2 =40 marks)
1. M.M.T. (Individual & group )
2. Posture Assessment
3. Posture re-training
5. Functional re-education
   a. Bed mobility
   b. Wheel chair Mobility
   c. Gait Re-training
6. Mat Activities
7. Muscle work analysis
8. 6 minute walk test.

C. Journal (5 marks)
INTERNAL ASSESSMENT
THEORY
Two papers - Terminal and Prelim examination of 80 marks each
Total - 160 marks
Internal Assessment to be calculated out of 20 marks

4. ELECTROTHERAPY II

Didactic – 100 hrs + Practical / laboratory – 200 hrs

Objective:
At the end of the course, the candidate will be able to –
1] Describe the Production & Physiological effects, Therapeutic uses, merits, demerits indication & contraindications of Various low/medium Frequency Currents modes.
2] Describe the Physiological effects & therapeutic uses of various therapeutic ions & Topical Pharmacotherapeutic agents to be used for the application of Iontophoresis & sono / phonophoresis
3] Acquire the skill of Application of the Electro therapy modes like UVR and LASER on models, for the purpose of Assessment & Treatment.
4] Acquire an ability to select the appropriate mode as per the tissue specific & area Specific application.

Syllabus:

1. Low frequency currents –

Must know

- Physiological effects, therapeutic uses, indications and contraindications and dangers of faradic type current, intermittent galvanic current and galvanic current 15 Hrs
- Cathodal /Anodal Galvanism, Iontophoresis – with various ions & Pharmacotherapeutic drugs. 5hrs
- Electrical stimulation for re-education – short / long pulse motor points. 10 hrs
- Strong surged faradic current under pressure / elevation. 4 hrs
- Electrical Reactions and Electro – diagnostic tests: 18 hrs
  - 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 and characteristics
    Chronaxie, Rheobase & pulse ratio
- High voltage pulsed galvanic current 2 hrs
- TENS: Define, Principles of production, types, dosage, electrode placement, Physiological and therapeutic effects, indication and contraindications. 5 hrs.

Desirable to know -
  b] Didynamic currents 1 hrs.

2. Medium frequency currents – 10 hrs.
Must know –
  a) Interferential therapy: Define, Principles of production, static Interferential system, dynamic interference system, dosage, electrode placement, Physiological and therapeutic effects, indication and contraindications.
  b) Russian currents 1 hr
  c) Rebox type currents 1 hr


4. Ultra – violet rays (UVR): 8 hrs
   a) Wavelength, frequency, types & sources of UVR generation, techniques of irradiation, physiological & therapeutic effects, indications, contraindications, precautions, operational skills of equipment & patient preparation. Dosimetry of UVR.

5. Light Amplification of stimulated Emission of Radiation (LASER)– Definition, historical background, physical principles, biophysical effects, types, production, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation. 5 hrs
6. Care of wound – application of Therapeutic currents, Ultrasound, U.V.R. & LASER  

4 hrs

7. Combination Therapy  

2 hrs

Desirable to Know
8. Intermittent therapy unit, its operation and different methods of application region wise.  

2 hrs

9. Interferential pneumatic therapy unit, its operation and different methods of application – region wise.  

2 hrs

PRACTICAL
Skills of application to be practiced on models – in No-1 to 7 above

TEXT BOOKS
1. Clayton’s Electro Therapy
2. Electro therapy Explained – by Low & Reed
3. Electro Therapy – by Kahn
4. Therapeutic Electricity – by Sydney Litch

REFERENCE BOOKS
Clinical Electro Therapy – by Nelson & Currier

SCHEME OF EXAMINATION

THEORY – 80 MARKS + I.A. – 20 MARKS; TOTAL 100 MARKS
PRACTICAL /LAB – 80 MARKS; I.A. – 20 MARKS TOTAL 100 MARKS

THEORY – Model question paper

Section A- M.C.Q.
Q1] Based on Single best answer [20 x 1] ----------------------20 marks
[To include all MUST KNOW areas]
Section B- S.A.Q.
Q-2] Answer any FIVE out of Six [5 x 3]------------------------15 marks
Q-3] Answer any THREE out of Four [3 x 5] ----------------- 15 marks
Section C-L.A.Q.

Q-4] Based on Low frequency modes ------------------------ 15 marks
Q-5] Based on Medium frequency currents ----------------------- 15 marks

**OR**

Q-6] Based on U.V.R./LASER -------------------------------- 15 marks

LAQ should give break up of 15 marks – e.g. [3 +5+7]

**PRACTICAL /LABORATORY** (80 marks)

1. Long Case – On model Motor points /U. V. R. Test Dose. Faradism under Pressure (35 marks)
2. Two Short Case - based on TENS/LASER/ medium Freq current / low frequency current. (20 x 2 =40 marks)
3. Journal (5 marks)

**INTERNAL ASSESSMENT ( I. A.)**

**THEORY**

Two papers -terminal and prelim examination of 80 marks each.

I.A. to be calculated out of 20 marks.

**PRACTICAL**

Two exams - terminal and prelim examination of 80 marks each

I.A. to be calculated out of 20 marks.
5. BIOMECHANICS (95 hrs)

Objectives:
1] To acquire the knowledge of axis and planes.
2] To review the anatomy of each joint.
3] Learn thoroughly about each movement occurring at each joint.
4] To acquire the knowledge of forces acting at various joints.
5] To acquire the knowledge of muscle and joint work in activities of daily living.

Section – I - Mechanics 5 Hrs
- Introduction to mechanics including motion, forces, parallel forces system
- Newton’s law of motion, concurrent force systems – composition forces, muscle action line etc.
- Centre of Gravity, line of gravity, stability and equilibrium.
- Introduction to Bio-Mechanics and terminology.
- Axes and planes with movements occurring at each joint in respective plane.

Section – II - Muscle Structure and function 5 Hrs
- Muscle structure: Composition, unit, structure, architecture of muscle
- Classification ofMuscles
- Functions of muscles and factors affecting its function.
- Effect of immobilization, injury and aging on muscle.
- Group action of muscle

Section – III
- Basic principles of Joint design and a human joint. 2 Hrs
- Tissues present in human joint including fibrous tissue, bone cartilage and connective tissue. 2 Hrs
- Classification of joints. 2 Hrs
- Recall anatomy and study the biomechanics in detail of following joints
i) Upper limb: shoulder girdle, elbow, wrist and hand  20 Hrs  
ii) Lower Limb: Hip complex, knee, ankle and foot  20 Hrs  
iii) Vertebral Column: Cervical, Thoracic, thoracic cage, Lumbar and Sacroiliac spine.  15 Hrs  
iv) Temporomandibular joint  4 Hrs  

- Joint function, Kinematics chains and range of motion. Kinetics & Kinematics of various activities of daily living e.g. supine to sitting, sitting to standing, squatting, climbing up & down, lifting, pulling, pushing, overhead activities, walking running, jogging.  15 Hrs  

Desirable to know –  5 Hrs  
Biomechanical alterations of all joint due to muscle weakness, joint stiffness and its implications

SCHEME OF EXAMINATION
THEORY-80 MARKS + INTERNAL ASSESSMENT- 20 MARKS

Section-A
• MCQ-Q  
Q – 1] Based on -Single best answer [20 x 1]  
20marks (20 Min.)

Section-B
• SAQ  
Q-2]-Answer any FIVE out of Six — [5 x 3]  
15 marks  
Q-3]-Answer any THREE out of Four - [3 x 5]  
15 marks

Section-C
• LAQ-Q  
Q-4] [compulsory]—Based on biomechanics of vertebral column  
15 marks  
Q-5]-Based on Biomechanics of any joint of upper limb  
5 marks  

OR  
Q-5]-Based on Biomechanics of any joint of  lower limb  
15 marks  

LAQ should give break up of 15 marks – e.g. [3 +5+7]
INTERNAL ASSESSMENT (I. A.)

THEORY
Two papers - terminal and prelim examination of 80 marks each.  
Total - 160 marks

I.A. to be calculated out of 20 marks.

6. PSYCHOLOGY & SOCIOLOGY  
(Didactic – 50Hrs)

Objective:
At the end of the course, the candidate will
1. Be able to define the term Psychology & its importance in the Health delivery System & will gain knowledge of Psychological maturation during human Development & growth & alterations during aging process.
2. Be able to understand the importance of psychological status of the person in Health & disease, environmental & emotional influence on the mind & personality.
3. Acquire the Knowledge as to how to deal with the patients.
4. Socio economic and cultural differences.
5. Socioeconomic and cultural issues related to morbidity owing to the physical disability and handicaps.

Syllabus: -
A. PSYCHOLOGY (Didactic 20 hrs.)

Section – I - General Psychology

Must know -
1. Introduction to Psychology  
   a. Definition and nature of Psychology, Fields & subfields of psychology.
   b. Schools of thoughts – Structuralism, functionalism, Behaviourism, Gestalt, Psycho-analytic Theory
2. Developmental Psychology  
   a. Definition & its Theories - Physiological and psychological changes during Infancy, Early & Late childhood, adolescent stage, Puberty, adulthood & old age
3. Emotions—nature & relationship with autonomic nervous system—

Theories of emotions


4. Motivation—

a. Maslow's hierarchy of motives, Theories of motivation; Conflict & Frustration—Types of conflicts, Common Defense mechanism, stress

Desirable to know -

1. Attention & perception Nature of attention, Nature of perception, Principle of grouping

2. Memory- Definition and nature, types of memory and forgetting cause

3. Learning

Definition and theories, conditioning, Role of learning in human life—Conditioning

4. Abnormal Psychology

Deference between normal & Abnormal, Causes of abnormality

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.


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

6. Personality Styles: Different personality styles of patients.

Text books

B. SOCIOLOGY (Diadactic 20 hrs)

MUST KNOW
1. Introduction – Definition & Relevance with Physiotherapy. (1 hr)
2. Sociology & Health – Social factors affecting Health Status, Social Consciousness & Perception of Illness, Decision Making in taking Treatment. (1 hr)
3. Socialization – Definition, Influence, of Social Factors, on Personality, Socialization in the Hospital & Rehabilitation of the patients. (1 hr)
4. Social groups-Concepts, Influence of formal & informal groups of Health & Diseases. (2 hr)
5. Community Role of Rural & Urban communities in Public Health, Role of community in determining Beliefs, Practices & Home Remedies in Treatment. (2 hr)
6. Social problems of the Disabled-Consequences of the following social problems in relation to sickness disability, remedies to prevent these problems
   a] Population Explosion  b] Poverty & Unemployment (1 hr)
7. Social Security & Social Legislation in relation to the Disabled. (1 hr)

DESIRABLE TO KNOW
1. Role of Primary & Secondary Groups in the Hospital & Rehabilitation Setting. (2 hr)
2. Family-Influence on human personality, Individual Health, Family & Nutrition Effects of Sickness on Family Psychosomatic Diseases & Family (1 hr)
3. Culture-Components Impact on Human Behaviour Cultural Meaning of Sickness Response to Sickness & Choice of Treatment. (2 hr)

4. Caste systems-Features of Modern Cast Systems & its Trends, Social change factors – Human Adaptation, Stress, Deviance, Health Programme, Role of Social Planning in the improvement of Health & in Rehabilitation. (1 hr)

5. Social Control – Definition, Role of norms, Folkways, Customs, Morals, Religion, Law & other means of social controls in the regulation of Human Behaviour, Social Deviance & Disease (1 hr)

6. Prostitution, Alcoholism, Beggary, Problems of Women in Employment, Role of a Social Worker. (2 hr)

NICE TO KNOW
1] Role of Culture as Social consciousness in moulding the Perception of Reality, Culture induced Symptoms & Diseases, Sub-Culture of Medical Workers. (1 hr)
2] Social problems of the Disabled-Consequences of the following social problems in relation to sickness disability, remedies to prevent these problems – Juvenile delinquency (1 hr)

Text Books
1] Sachdeva, &Bhushan-An introduction to sociology – Allahabad; kitabmahal ltd.1974

SCHEME OF EXAMINATION - [THEORY ONLY]
THEORY-40 MARKS + INTERNAL ASSESSMENT-10 MARKS
[There shall be No Long Answer Questions in this paper]
Section-A:
Q. 1:- 10 MCQs – 5 (Five) in Psychology and 5 (Five) in Sociology— [10 x 1]-----10 marks

Section – B- Psychology Paper:
Q. 2 :- Answer any THREE out of four [3x 5] ---------------15 marks

Section –C-Sociology Paper:
Q.3 :- Answer any THREE out of four [3 x 5] ---------------15 marks
## University Examination Pattern

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