



**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR**

SECOND YEAR, FIRST TRIMESTER EXAMINATION

**FOR THE DEGREE
OF
BACHELOR OF SCIENCE IN PHYSIOTHERAPY
MAIN PAPER**

COURSE CODE: BSP 212

COURSE TITLE: EXERCISE THERAPY I

DATE:

TIME:

INSTRUCTIONS TO CANDIDATES

Answer All Questions

Section A: Multiple Choice Questions (MCQ)	20 Marks.
Section B: Short Answer Questions (SAQ)	40 Marks.
Section C: Long Answer Question (LAQ)	40 Marks

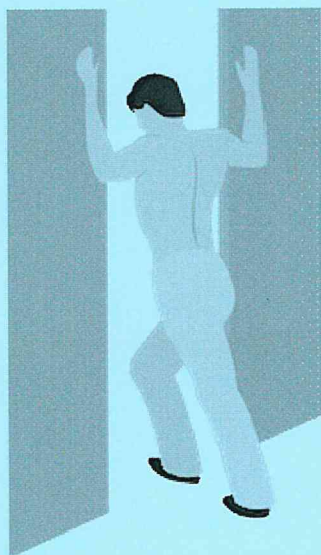
TIME: 3 Hours

MMUST observes ZERO tolerance to examination cheating

This paper has 5 pages

SECTION A: MULTIPLE CHOICE QUESTIONS (MCQ) 20 MARKS

1. A client requires stretching to target a tight extensor carpi radialis brevis muscle. The RMT must apply the following technique:
 - a) Wrist and elbow extension
 - b) Wrist and elbow flexion
 - c) Wrist extension, elbow flexion
 - d) Wrist flexion, elbow extension
2. Which of the following muscles are you stretching when you apply passive forced dorsiflexion to your client's foot while his knee is flexed?
 - a) popliteus
 - b) tibialis anterior
 - c) gastrocnemius
 - d) soleus
3. A physiotherapist instructs a patient to perform a stretch as shown in the image. This type of stretch would most likely be used to stretch the:



- a) upper trapezius
 - b) middle trapezius
 - c) pectoralis minor
 - d) triceps
4. This movement is produced entirely by an active contraction of the muscles:
 - a) AA-ROM

- b) PR-ROM
 - c) A-ROM
 - d) P-ROM
5. With your client prone and the arm at a 90 degree angle hanging off the side of the table, how do you find the muscle belly of the middle fibres of the trapezius?
- a) By sliding laterally and superiorly from the lateral border of the scapula
 - b) By sliding laterally and inferiorly from the spine of the scapula
 - c) By sliding medially and superiorly from the spine of the scapula
 - d) By sliding medially and inferiorly from the spine of the scapula
6. You are asked to perform therapeutic exercises with a patient who has impairments in muscle performance. You could expect to do any of the following except
- a) Strength exercises.
 - b) Coordination exercise
 - c) Power exercise
 - d) Muscular endurance exercise
7. Interventions to improve impaired mobility include all of the following EXCEPT
- a) Range of motion exercises.
 - b) Joint mobilization exercises
 - c) Proprioceptive exercises
 - d) Stretching exercise
8. According to the authors, the suggested number of repetitions for AROM to any given joint is:
- a) 2-3
 - b) 3-5
 - c) 5-10
 - d) 15-20
9. The following position offers the greatest protection of control of the upper extremity when performing self-assisted shoulder flexion AAROM using a wand / T-bar?
- a) Sideling
 - b) Supine
 - c) Sitting
 - d) Standing
10. All are types of ROM exercises except:
- a) Active ROM
 - b) Passive ROM
 - c) Active- Assistive ROM
 - d) Super ROM
11. Indications for AROM exercises can be any of the following except:
- a) Aerobic conditioning
 - b) Early strengthening
 - c) To mobilize segments above and below an immobilized area.
 - d) To maintain general extremity strength in a region where there is acute, inflamed tissue

12. A person who has been on extended bed rest has a hip contracture that places the hip in a position of external rotation. You note in your documentation that your patient has a:
- hip flexion contracture
 - hip adduction contracture
 - hip internal rotation contracture
 - hip external rotation contracture
13. The type of stretching technique that utilizes a high-speed, high-intensity, and short-duration stretch force is called a:
- ballistic stretch
 - static stretch
 - cyclic stretch
 - mechanical stretch
14. Which of the following is NOT a precaution for stretching interventions?
- Patient with suspected osteoporosis
 - Soreness after previous session that lasted 4 hours
 - Edematous tissue
 - Patient who has been on prolonged bed rest
15. type of joint mobilization that includes an isometric muscle contraction to cause accessory movement of the joint is:
- Manipulation under anaesthesia
 - Thrust
 - muscle energy
 - mobilization
16. A sustained joint-play technique that has an amplitude large enough to place a stretch on the joint capsule is described as which of the following?
- Grade I
 - Grade II
 - Grade III
 - Grade IV
17. The initial resting position of the knee to mobilize the patella-femoral joint is:
- Full extension
 - 10 degrees knee flexion
 - 20 degrees knee flexion
 - 30 degrees knee flexion
18. Continuous passive motion apparatus is used to
- Increase range of motion
 - Maintain range of motion
 - Strengthen knee muscles
 - All of the above
19. What is another term for isometric contraction?
- Therapeutic Exercise
 - Concentric Contraction
 - Adjunctive Modalities
 - Static Contraction

20. Examples of isotonic contraction

- a) Lifting a fork to eat, Picking up a pen, Lifting a 5 lb. barbell (bicep curl)
- a) Muscle contraction, Joint moves, Muscle shortens, With or without resistance
- b) Moves the joint through available ROM and applies gentle stretch at the end range
- c) Carrying a grocery bag, Pressing down on a table, Tightening muscles inside a cast

SECTION B: SHORT ANSWER QUESTIONS (SAQ)**40 MARKS****ANSWER ALL QUESTIONS.**

- Describe*
1. State 10 contraindications for joint mobilizations (10 marks)
 2. Describe Macqueen's power system (10marks)
 3. State the merits and demerits of manual muscle testing (5 marks)
 4. State the 5 goals of passive motion (5 marks)
 5. State 5 goals for AROM (5 marks)
 6. State 5 indications for goniometry (5 marks)

*Describe***SECTION C: LONG ANSWER QUESTIONS (LAQS)****40 MARKS****CHOOSE TWO QUESTIONS EACH ONE IS 20 MARKS**

- Discuss*
1. Describe the types, application methods, effects and uses of suspension therapy giving relevant examples (20 marks)
 2. Define PNF and describe the principles of PNF. Add a note on PNF arm and leg patterns (20 marks) *Discuss*
 3. Define Frenkel's exercises. Discuss the principles of Frenkel's exercises and indicate which type of patients are suitable for these exercises (20 marks)
 4. Discuss free exercises, its classifications, techniques, effects and uses (20 marks)

COURSE CONTENT

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY

BACHELOR OF SCIENCE IN PHYSOTHERAPY

BSP 212 EXERCISE THERAPY I (3 Units)

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BSP212EXERCISE THERAPY I (3 Units)

Purpose of the Course

The student will learn the principles of exercise as a therapeutic modality and will learn the techniques in the restoration of physical functions.

Expected Learning Outcomes

To introduce the students on the importance of exercise to health.

To avail knowledge of exercise testing methods to the trainees.

Introduction to passive and active exercise testing.

Course Content:

Introduction to Exercise Therapy

The aims of Exercise Therapy, the techniques of Exercise, Approach to patient's problems, assessment of patient's condition – Measurements of Vital parameters, Starting positions – Fundamental Positions and derived Positions, Planning of Treatment.

Methods of Testing

- a) Functional tests b) Measurement of joint range: ROM – Definition, Normal ROM for all peripheral joints and spine, Goniometer-parts, types, principles, uses Limitations of goniometry, Techniques for measurement of ROM for all peripheral joints c) Tests for neuromuscular efficiency.
 - Electrical tests; * Manual Muscle Testing: Introduction to MMT, Principle and Aims, Indications and Limitations, Techniques of MMT for group and individual muscles: Techniques for MMT for upper limb/Techniques of MMT for lower limb/Techniques for spine. *Anthropometric Measurements: Muscle girth – biceps, triceps forearm, quadriceps, calf; * Static Power Test.
 - Dynamic power Test; * Endurance Tests; * Speed Test. d) Tests for Coordination. e) Tests for Sensation limb length. h) Measurement of the angle of pelvic Inclination

Relaxation

Definitions: Muscle Tone, Postural tone, Voluntary Movement, Degrees of relaxation, Pathological tension on muscle, Stress mechanics, types of stresses, Effects of stress on the body mechanism, Indication of relaxation, Methods and techniques of relaxation – Principles and uses: General, Local, Jacobson's, Mitchel's, additional methods.

Passive Movements

Causes of immobility, Classification of Passive movements, and Specific definitions related to passive movements, principles of passive movements, Indications, contraindications, effects of uses, Techniques of giving passive movements.

Active Movements

Definitions of strength, power and work, endurance, muscle actions. Physiology of muscle performance: structure of skeletal muscle, chemical and mechanical events during contraction and relaxation, muscle fibre type motor unit, force graduation. Causes of decreased muscle performance. Physiologic adaptation to training: Strength, Power and Endurance. Types of active movements: Free exercise: Classification, principles, techniques, indications, contraindications, effects and uses. Types of resisted Exercises: Manual and Mechanical resistance exercise, Isometric exercise, Dynamic exercise: Concentric and Eccentric, Dynamic exercise: Constant versus variable resistance, Isokinetic exercise, Open-Chain and Closed-Chain exercise. Specific exercise regiments. Isotonic: de Lormes, Oxford, Macqueen, Circuit weight training Isometric: BRIME (Brief Resisted Isometric Exercise) Multiple Angle Isometrics, Isokinetic regiments.

Proprioceptive Neuromuscular Facilitation

Definition and goals; Basic neurophysiologic principles of PNF: Muscular activity, Diagonal patterns of movement: upper limb, lower limb. Procedure: components of PNF Techniques of fasciliation. Mobility: Contract Relax, Hold relax, Rhythmic initiation
Strengthening: Slow reversal, repeated contractions, timing for emphasis, rhythmic stabilization.
Stability: Alternating isometric, rhythmic stabilization. Skill: timing for emphasis, resisted progression. Endurance: slow reversals, agonist reversal.

Suspension Therapy

Definition, principles, equipment and accessories, Indication Benefits of suspension therapy. Types of suspension therapy: axial, vertical, pendular. Techniques of suspension therapy for upper limb. Techniques of suspension therapy for lower limb.

Practical

The students of exercise therapy are to be trained in Practical Laboratory work for all the topics discussed in theory. The student must be able to evaluate and apply judiciously the different methods of exercise therapy techniques on the patients. They must be able to:-

Demonstrate the technique of measuring using goniometry.
 Demonstrate muscle strength using the principles and technique of MMT.
 Demonstrate the techniques for muscle strengthening based on MMT grading.
 Demonstrate the PNF techniques.
 Demonstrate exercises for training co-ordination – Frenkel’s exercise.
 Demonstrate the techniques for massage manipulation.
 Demonstrate techniques for functional re-education.
 Assess and train for using walking aids.
 Demonstrate mobilization of individual joint regions.
 Demonstrate to the use the technique of suspension therapy for mobilizing and strengthening joints and muscles.
 Demonstrate the techniques for muscle stretching.
 Assess and evaluate posture and gait.
 Demonstrate to apply the technique of passive movements
 Demonstrate various techniques of Active movements
 Demonstrate to apply the technique of passive movements
 Demonstrate techniques of strengthening muscles and using resisted exercises.
 Demonstrate techniques for measuring limb length and body circumference.

Mode of Delivery

Lectures
 Tutorials
 Practical
 Group discussions

Instructional Material

Practical exercises
 Wall Charts
 Audio-visual Aids

Course Assessment

Written Examination 70%
 Continuous Assessment 30%

Core Reading Materials

Principles of muscle testing by Hislop.
 Principles of exercise therapy by M. Dena Gardener.

Recommendation Reference Materials

Therapeutic exercise by Basmajian
 Practical exercise therapy by Hollis Margaret.