



(University of Choice)
**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2023/2024 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: Monday 4th December 2023

TIME: 8:00am – 10:00 am

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: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This paper has 5 pages

SECTION A: MULTIPLE CHOICE QUESTIONS (MCQ) 20 MARKS

1. Frenkel's exercises are devised to improve co-ordination by use of sight, sound and touch in case of ataxia due to _____.

- A. Cerebellar lesion
- B. Loss of kinesthetic sensation
- C. Spastic paralysis
- D. Flaccid paralysis

2. Angie Western, 35, was referred to you by her doctor for the treatment of carpal tunnel syndrome. Her symptoms appeared about 1 month ago and worsened last week. She cannot type for more than 10 minutes before the pain becomes overwhelming. She has difficulty using utensils and reports that she often drops things. Your assessment confirms carpal tunnel syndrome. During the testing and treatment, you notice that AF and PR ROM elicit moderate bilateral numbness and tingling. As self-care, you prescribe:

- A. Endurance resistance exercise for the forearm flexors
- B. Strength resistance exercise for the forearm flexors
- C. Stretching for the forearm flexors within a comfortable range
- D. Muscle setting for the forearm flexors to reduce pain
- E. C & D

3. Which of the following best defines muscle strength?

- A. Ability of muscle to contract repeatedly against a load
- B. Work produced by a muscle per unit of time
- C. Produce or control forces imposed during functional activities
- D. Force generated during a single maximum effort

4. Of the following, which is the most effective way to improve muscle endurance?

- A. Have the patient train on an isokinetic dynamometer at fast speeds only
- B. Have the patient train using dynamic exercise against submaximal loads over progressively longer time periods
- C. Have the patient exercise against maximal resistance for a limited number of repetitions
- D. Have the patient train by using isometric exercises against resistance

5. Mrs. B. is an 87-year-old resident of Western Hills Skilled Nursing Facility. She sustained a compression fracture of the T12 vertebra several weeks ago when she inadvertently sat down forcefully on a hard chair. Incorporating resistance training that focuses on eccentric exercises of her quadriceps and gluteal muscles in weight-bearing positions (e.g., controlled squatting and partial lunges) represents what principle of therapeutic exercise?

- A. Specificity of training
- B. Reversibility of training
- C. Overflow principle
- D. Overload principle

6. Which of the following is a contraindication to implementing resistance exercise?

- A. Risk of pathological fracture due to osteoporosis
- B. Joint instability
- C. Acute pain or inflammation
- D. If muscle soreness occurs after a bout of exercise

7. Within 1 week of beginning resistance exercise of the shoulder external rotators as a component of a rehabilitation program after a shoulder injury, your patient, Mr. K., is able to increase the level of resistance by using a heavier grade of elastic tubing. This improvement in muscle performance is due primarily to which of the following adaptive changes?
- A. Increased recruitment of motor units
 - B. Increased oxygen to the muscle
 - C. Hypertrophy of muscle fibers
 - D. Fiber-type transformation from slow twitch to fast twitch
8. Following surgery and 8 weeks of rehabilitation for carpal tunnel syndrome, you notice that the patient's thenar eminence is almost the same size as that of the uninvolved hand. This change is due to which of the following adaptive changes?
- A. Increased recruitment of motor units
 - B. Hyperplasia of muscle fibers
 - C. Hypertrophy of muscle fibers
 - D. Fiber type transformation
9. Each of the following is an indication that muscle fatigue is occurring when a patient is exercising against resistance except:
- A. Muscular tremor occurs during the exercise
 - B. Temporary loss of sensation in the exercising muscles
 - C. The patient may not be able to complete the available ROM against the initial level of resistance applied
 - D. The patient may attempt to use a substitute motion and muscle group to perform the exercise
10. It has been shown that after resistance exercise to exhaustion, recovery from exercise (recovery from fatigue) occurs most efficiently if:
- A. The fatigued muscle rests completely during recovery
 - B. Cold is applied to the fatigued muscle
 - C. The patient performs low-intensity, active exercise using the fatigued muscle
 - D. The muscle is passively stretched during recovery
11. Which components of a resistance exercise program should be modified (manipulated) during the program to produce training-induced improvement in muscle endurance?
- A. Position of the patient and load
 - B. Sets and mode of exercise
 - C. Load and repetitions
 - D. Repetitions and mode of exercise
12. Your goal is to improve lower extremity proprioception, balance, and strength. Which of the following closed-chain exercises is the most challenging?
- A. Have the patient stand on one foot on a piece of foam and maintain his balance
 - B. Have the patient kneel in an upright position on a piece of foam and shift his weight from side to side
 - C. Have the patient stand on the floor on one leg and maintain his balance
 - D. Have the patient stand on the floor with weight equally distributed on both feet and throw and catch a ball

13. You are having a patient perform manual resistance exercise of the lower extremity using a PNF diagonal pattern. In which of the following lower extremity patterns is ankle dorsiflexion coupled with eversion resisted?

- A. D1 flexion
- B. D1 extension
- C. D2 flexion
- D. D2 extension

14. You have a patient assume a prone-lying position and prop symmetrically on his forearms. You apply manual resistance in several directions at the shoulder girdles as you ask the patient to hold (maintain) the symmetrical position. This technique is known as:

- A. Agonist-contraction
- B. Rhythmic stabilization
- C. Recurrent facilitation
- D. Repeated contractions

15. Of the following, which is the best definition of an "8 RM"?

- A. The number of repetitions of a particular exercise a patient can perform in 8 seconds against a specific load (amount of resistance)
- B. The number of sets (bouts) of a specific exercise a patient can perform for 8 repetitions
- C. The greatest amount of resistance (load) a patient can lift or lower through the available ROM in 8 seconds
- D. The greatest amount of resistance (load) a patient can lift or lower through the available ROM for 8 repetitions (no more, no less).

16. Examples of plyometric activities for the upper extremities could include any of the following except:

- A. Wall push-ups
- B. Clap push-ups
- C. Catching and throwing a weighted ball
- D. Dribbling a ball against the wall

17. Mitchell technique of relaxation is based on the principle of _____.

- A. Reciprocal innervations
- B. Autogenic inhibition
- C. Cue controlled relaxation
- D. Released only

18. While descending the stairs, the therapist must stand _____.

- A. Behind the patient
- B. Behind the patient towards the weaker side
- C. In front of the patient
- D. In front of the patient towards the weaker side

19. In which of the PRE the load remains constant during the training session

- A. Delorme
- B. Watkin
- C. Zinovief

20. In regard to ballistic stretching, it is true that:

- A. After each ballistic stretch the final stretch position is held for 10-15 s.
- B. Stress relaxation is greater after a ballistic than static stretch.
- C. For a given magnitude of stretch, passive force increases to a higher level after a ballistic than static stretch.
- D. None of the above are true

SECTION B: SHORT ANSWER QUESTIONS (SAQ)

40 MARKS

ANSWER ALL QUESTIONS.

1. Describe half kneeling position and its muscle work (5 marks)
2. Describe open and closed kinematics (5 marks)
3. Define active movement. Classify active movements (5 marks)
4. Discuss the physiologic effects of passive movements (5 marks)
5. Discuss the effects of immobilization (5 marks)
6. Write short notes on Jacobson's relaxation technique (5 marks).
7. Write short notes on De'lormes technique (5 marks).
8. Discuss the surface landmarks for identification of spinal vertebrae (5marks)

SECTION C: LONG ANSWER QUESTIONS (LAQS)

40 MARKS

ANSWER ALL QUESTIONS EACH ONE IS 20 MARKS

1. Describe the various relaxation exercises with reference to their principles and application (20 marks).
2. Explain in detail the principles, techniques of Proprioceptive neuromuscular facilitation (PNF) (20 marks)