



(University of Choice)

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

MAIN CAMPUS

UNIVERSITY EXAMINATIONS

2023/2024 ACADEMIC YEAR

FINAL QUALIFYING EXAMINATIONS

OF

BACHELOR OF SCIENCE IN PHYSIOTHERAPY

COURSE CODE: BSP 436

COURSE TITLE: REHABILITATION SCIENCES PAPER I

DATE: THURSDAY 7TH DECEMBER 2023

TIME: 8:00AM – 10:00AM

INSTRUCTIONS TO CANDIDATES

Answer all Sections

Sec A: Multiple Choice Questions (MCQ) (20 Marks)

Sec B: Short Answer Questions (SAQ) (40 Marks)

Sec C: Long Answer Questions (LAQ) (40 Marks)

TIME: 3 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 4 Printed Pages. Please Turn Over.



NEUROPHYSIOTHERAPY

Multiple Choice Questions (MCQs)

15 Marks

1. Typical symptoms of multiple sclerosis may include all of the following except:
 - A. Tingling, burning, aching or “numb” sensations.
 - B. Weakness of the legs
 - C. Double vision
 - D. Distal limb atrophy
 - E. Ataxia
2. A 16-year-old is involved in a boda boda accident. She was not wearing a helmet. On examination she is comatose has bruising around her eyes and behind her right ear and drainage of clear fluid from the nose and the right ear. Based on the findings which of the following is most likely present in this case.
 - A. Epidural hematoma
 - B. Skull base fracture
 - C. Intraparenchymal hemorrhage
 - D. SAH
 - E. Subdural hematoma
3. A 40-year-old man presents with tinnitus, unilateral hearing loss, nausea, vomiting and vertigo. On examination he has nystagmus, ipsilateral ataxia, ipsilateral Horner’s syndrome and contralateral sensory deficits to pain and temperature of the arm, trunk and leg. Which of the following is the most likely diagnosis?
 - A. Anterior inferior cerebellar artery (AICA) stroke
 - B. Posterior inferior cerebellar artery (PICA) stroke
 - C. Midbrain infarct
 - D. Occipital lobe infarct
4. Regarding the ulnar nerve, which of the following is correct?
 - A. It innervates several muscles above the elbow
 - B. It is a continuation of the medial cord.
 - C. It is most susceptible to injury at the lateral epicondyle
 - D. It passes through the carpal tunnel to reach the hand.
 - E. It predominantly carries C5 and C6 fibers
5. A 52-year-old man presents with gradually progressive dysphagia, dysphonia and bilateral ptosis. There is no fatigability, which muscular dystrophy does he most likely have?
 - A. Becker
 - B. Myotonic
 - C. Emery-Dreifuss
 - D. Facioscapulohumeral
 - E. Oculopharyngeal
6. Impairment in which of the following structures would be most likely to be associated with personality changes?
 - A. Orbital frontal cortex
 - B. Parietal lobe
 - C. Lateral medulla
 - D. Occipital lobe
7. A 46-year-old with a history of pelvic cancer presents with severe radicular pain in the perineum and radiating to both legs, right and more than left. On examination she has asymmetrical sensory deficits in the perineum and in the legs, bilateral asymmetrical lower extremity weakness and areflexia. Which of the following is correct regarding this patient’s condition?

- A. She has a cauda equina syndrome
 - B. She has a lesion in the conus medullaris
 - C. She has an intramedullary tumor
 - D. She has transverse myelitis
 - E. She has epidural hematoma
8. In traumatic brain injury which of the following signs or symptoms is most likely to persist and interfere with rehabilitation?
- A. Memory loss
 - B. Motor deficit
 - C. Altered personality
 - D. Sensory deficit
 - E. Language dysfunction
9. You are helping the patient with a spinal cord injury to establish a bladder retraining program. What strategies may NOT stimulate the patient to void?
- A. Stroke the patient's inner thigh.
 - B. Advice on intermittent straight catheterization
 - C. Pour warm water over the perineum
 - D. Tap the bladder to stimulate detrusor muscle
10. Which test will not be predictive for cervical radiculopathy?
- A. Positive upper limb tension test
 - B. Distraction test
 - C. Spurling's Test
 - D. Cervical rotation more than 60 degrees to involved side
11. A 59 year old with a history of atrial fibrillation and hypertension presents with right hemiparesis affecting mainly the face and arm. Her eyes are deviated to the left. She seems to be able to understand and follow commands, however cannot verbalize and appears frustrated when asked questions because she cannot answer. Where is the most likely location of the vascular occlusion?
- A. Trunk of the left MCA before the bifurcation
 - B. Lenticulostriate branches of the left MCA
 - C. Superior division of the division of the left MCA
 - D. Inferior division of the left MCA
12. Which of the following symptoms is typically the earliest symptom of Alzheimer's disease?
- A. Immediate memory impairment
 - B. Recent memory impairment
 - C. Procedural memory impairment
 - D. Apraxia
13. Which of the following is correct regarding the tibial nerve?
- A. A lesion at the level of the tarsal tunnel manifests with plantarflexion weakness
 - B. The calcaneal branch innervates the abductor hallucis and flexor digitorum brevis
 - C. The sural nerve arises from the tibial nerve after it passes through the tarsal tunnel
 - D. The tibialis anterior is an L5 and tibial nerve innervated muscle
 - E. It innervates the semimembranosus, semitendinosus and long head of the biceps femoris
14. A 25-year-old man is referred due to weakness. The patient has frontal balding, atrophy of the temporalis and masseter muscles, weakness of the sternocleidomastoids

and bilateral ptosis. He also the upper extremity weakness especially in forearm extensor as well as atrophy of the anterior tibial muscles, with weakness of dorsiflexion of the feet. After percussion of his thenar eminence there is prolonged contraction and slow relaxation. Which of the following is the most likely diagnosis?

- A. Beckers
 - B. Myotonic
 - C. Emery-Dreyfuss
 - D. Facioscapulohumeral
 - E. Myotonic
15. A 64-year-old man presents with a right homonymous hemianopia. Which of the following is the most likely localization for this finding?
- A. Left upper lip of the calcarine cortex
 - B. Right optic tract
 - C. Left parietal lobe
 - D. Left lateral geniculate body
 - E. A temporal lobe infarct

Short answer questions (SAQs)

15 Marks

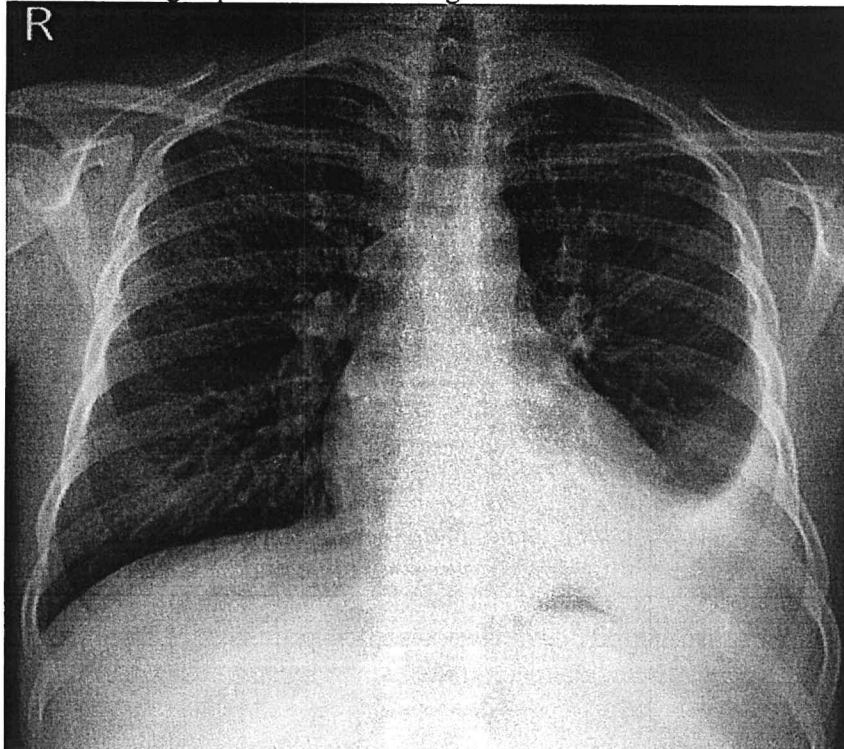
1. You are designing a rehabilitation program for a stroke patient, your aim is to enhance neuroplasticity. What principles would you adhere to
2. Outline the specific interventions to use to address flaccidity.

CARDIORESPIRATORY PHYSIOTHERAPY

SECTION A: MULTIPLE CHOICE QUESTIONS (MCQ) 15 MARKS

MCQS

1. Which finding is present on this image



- A. Normal X-ray image
- B. Sail sign

- C. Meniscus sign
- D. Pneumothorax
- E. Air bronchogram

2. What is the most likely cause of chest pain seen in this close-up chest X-ray image?



- A. Infection
- B. Cancer
- C. Trauma
- D. Fibrosis
- E. Sarcoidosis

3. A patient has the following pulmonary function tests results

Measure	Predicted	Observed	% predicted
Spirometry			
FVC (L)	3.19	2.48	78%
FEV ₁ (L)	2.62	0.96	37%
FEV ₁ /FVC (%)	82%	39%	
FEF 25-75% (L/S)	2.85	0.35	12%

What findings would you expect to see on a chest film given these PFT results?

- A. Blunted costophrenic angle
 - B. Lung hyperinflation
 - C. Pulmonary congestion
 - D. Tracheal deviation
4. A PT should be alert to recognize the signs and symptoms associated with the onset of aspiration pneumonia. Which patient diagnosis is the MOST susceptible to develop this form of pneumonia?
- A. A circumferential burn of the thorax associated with significant pain.
 - B. Severe scoliosis with compression of internal organs, including the lungs.
 - C. Amyotrophic lateral sclerosis (ALS) with dysphagia and diminished gag reflex.
 - D. A complete spinal cord lesion at T2 with diminished coughing ability and forced vital capacity (FVC).

5. A patient with no significant past medical history who now presents with a bacterial pneumonia in the right anterior base would present with which of the following exam findings?
- Decreased breath sounds throughout all lung fields, increased SaO₂, febrile.
 - Bronchial breath sounds at the right anterior base, increased SaO₂, febrile.
 - Crackles on inspiration only at right anterior base, decreased SaO₂ and productive cough x 3 days.
 - Wheezes on inspiration only throughout the right lung fields, decreased SaO₂, dry cough x 1 day.
6. A Physical therapist performs an evaluation of an inpatient 1 day after upper abdominal surgery. The therapist notices that there is an incentive spirometer on the patient's bedside table. What is the MOST appropriate indication for the use of incentive spirometry?
- Presence of atelectasis.
 - Signs of cognitive impairment.
 - Presence of ascites.
 - Sputum in the lungs.
7. The therapist is reading a recent report of arterial blood gas analysis with the following values:
 Fraction of inspired oxygen (FiO₂) = 0.21
 Arterial oxygen pressure (PaO₂) = 53 mm Hg
 Arterial carbon dioxide pressure (PaCO₂) = 30 mm Hg
 PH = 7.48
 Bicarbonate ion = 24 mEq/L
 What patient state do these findings indicate?
- Metabolic alkalosis.
 - Respiratory alkalosis.
 - Metabolic acidosis.
 - Respiratory acidosis.
8. A patient in the ICU is referred to physical therapy and presents with significant shortness of breath. Notable on physical examination is a deviated trachea to the left. Which of the following processes would account for such a finding?
- Right lung collapse.
 - Left pleural effusion.
 - Right hemothorax.
 - Left pneumothorax.
9. After an uncomplicated acute myocardial infarction (MI), which graded exercise test (GXT) should be administered to the patient before hospital discharge?
- Symptom-limited GXT at 10 days post MI.
 - Low level GXT at 4 to 6 days post MI.
 - GXT to 85% age predicted maximum HR 3 to 5 days post MI.
 - GXT to 75% age predicted maximum HR 4 to 6 days post MI.
10. A physical therapist is treating a recently extubated patient with medical COPD in the medical ICU. The most recent ABGs include:
 Fraction of inspired oxygen (FiO₂): 0.21
 PaO₂-73mmHg
 PaCO₂ -64mmHg
 PH: 7.28
 Bicarbonate: 24mEq/L
 What do these findings indicate?

- A. Metabolic alkalosis
 - B. Respiratory alkalosis
 - C. Metabolic acidosis
 - D. Respiratory acidosis
11. A patient is referred for physical therapy after a graded exercise test (GXT). The physician reports the test was positive and had to be terminated in 7 minutes. Which of the following criteria is an absolute indication for terminating exercise testing?
- A. Mild angina and dyspnea with progressive increases in the treadmill speed and grade.
 - B. A hypertensive response with blood pressure of at least 170/95.
 - C. ST segment depression from baseline of 3-mm horizontal or down sloping depression.
 - D. ECG changes from baseline of 1-mm ST segment elevation.
12. A patient with a recent history of rib fractures suddenly becomes short of breath during a bout of coughing. The patient looks panicked and complains of sharp pain in the left chest. A quick screen shows a deviated trachea to the right, among other signs and symptoms. What is the MOST likely diagnosis based on these symptoms?
- A. Pulmonary emboli.
 - B. Pneumothorax.
 - C. Angina.
 - D. Mucous plugging of an airway
13. What will a patient with a significant right thoracic structural scoliosis demonstrate on examination?
- A. Decreased breath sounds on the right.
 - B. Decreased thoracic rib elevation on the right.
 - C. Increased lateral costal expansion on the right.
 - D. Shortened internal and external intercostals on the right.
14. A patient with a long history of cigarette smoking has been admitted to the hospital and presents with tachycardia, signs of lung infection, abnormal breath sounds in both lower lobes, and dullness to percussion. What should the therapist's initial intervention focus on with this patient?
- A. **Getting the patient to quit smoking.**
 - B. **Breathing** reeducation to increase efficiency of ventilation.
 - C. **Airway clearance** and secretion removal.
 - D. **Graded inspiratory** muscle training.
15. Pursed lip breathing as part of the treatment regimen would be MOST appropriate for a patient with **which** condition?
- A. **Circumferential** thoracic burns.
 - B. **Asbestosis.**
 - C. **Rib fracture.**
 - D. **Emphysema.**

SAQ

1. Describe the different ventilator modes used in mechanical ventilation (10 marks)
2. Apart from postural drainage, percussions and vibrations, and suctioning, describe two other airway clearance techniques used by a physiotherapist (10 marks)

ORTHOPEDICS & TRAUMATOLOGY

SECTION A MCQS:

15 MARKS

1. All of the following are causes of spondylosis except one
 - A. Aging
 - B. Repetitive strain injury (RSI)
 - C. Alcohol
 - D. Smoking
2. Isthmic spondylolisthesis has the highest biomechanical force on spars at
 - A. L2-L3
 - B. L3-L4
 - C. L4-L5
 - D. L5-S1
3. All of the following are features confirms Phalen-Dixon Sign, which one is not
 - A. Hyperlordotic lumbar spine
 - B. Waddling gait
 - C. Tight hamstrings
 - D. Tight gluteal maximus
4. All of the following are the conservative active physiotherapy intervention in spondylolisthesis except one
 - A. Extension exercises
 - B. Abdominal strengthening exercises
 - C. Hamstring stretching exercises
 - D. Flexion exercises
5. All of the following are indications of arthroplasty except one
 - A. Severe OA of the hip joint
 - B. Un-united mid femoral fracture
 - C. Avascular necrosis
 - D. Advanced RA with disabling joint
6. Cemented hip arthroplasty is mainly indicated for
 - A. Children between 10-15 years
 - B. Elderly with life expectancy of 10-15 years
 - C. Young people between 25-35 years
 - D. Teenagers
7. All of the following are performed by the physiotherapist in day 2-3 post-operative following TKR, which one is not
 - A. Standing and ambulation with hinged knee stabilizer
 - B. Hamstring strengthening exercise
 - C. Assisted SLR
 - D. Gentle patellar mobilization
8. Which of the following is incorrect about dislocation about dislocation of sternoclavicular joint:
 - A. Posterior dislocation is rare and occurs due to direct indirect injury and is common type of dislocation
 - B. Posterior dislocation is rare and occurs due to direct injury over medial end of clavicle .
 - C. Sternoclavicular dislocation is common compared to acromioclavicular dislocation
 - D. Trachea can be compressed in posterior dislocation
9. Which of the following is incorrect about dislocation about dislocation of sternoclavicular joint:

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 - D. Trachea can be compressed in posterior dislocation
10. Fracture disease can be prevented by:
- A. Physiotherapy
 - B. Internal fixation
 - C. External fixation
 - D. Plaster immobilization of fractures
11. Which of the following fractures is slowest to heal and often develops non-union:
- A. Intracapsular femoral neck fracture
 - B. Scaphoid
 - C. Distal femur
 - D. Proximal humerus
12. Closed reduction with percutaneous K-wire fixation is best suitable for:
- A. Bennett fracture
 - B. Lateral malleolus fracture
 - C. Medial malleolus fracture
 - D. Lateral tibial condyle fracture
13. In a healing fracture amount of cartilage formation can be increased by:
- A. Rigid immobilization
 - B. Movement at fracture site
 - C. Necrosis of bone ends
 - D. Compression plating
14. Commonest cause of cubitus varus deformity following malunited supracondylar fracture of humerus is:
- A. Rotational displacement
 - B. Medial displacement
 - C. Proximal displacement
 - D. Posterior displacement
15. Which of the following joint(s) is/are rarely involved in pathogenesis of ankylosis spondylitis
- A. Shoulder joint
 - B. Costovertebral joints
 - C. Sacroiliac joints
 - D. Intervertebral joint

SAQ 10 MARKS

1. Discuss how Gustilo et al classifies open fractures
5 Marks
2. Discuss the preoperative training you will conduct with a Total Knee replacement (TKR) patient 5 marks

SPORTS MEDICINE

SECTION A –MCQs

(15 MARKS)

1. A competitive skier makes a turn to the right around a slope. The left ski turns in the snow causing external rotation of the left ski and boot. Which of the following ligaments is most likely to be the injured structure?

- A. Calcaneotibular ligament
 - B. Anterior inferior tibiofibular ligament
 - C. Deltoid ligament
 - D. Calcaneofibular ligament
2. The anterior drawer test with the ankle in 20 degrees of plantarflexion most effectively test for the laxity
 - A. Calcaneo-fibular ligament
 - B. Anterior talofibular ligament
 - C. Anterior inferior tibio-femoral ligament
 - D. Deltoid ligament
 3. To test for Achilles tendon tear, the therapist squeezes the calf muscle, the name of the test is?
 - A. Obers test
 - B. Homans test
 - C. Thomson's test
 - D. Simson's test
 4. Which type of hip pain may indicate a problem in the joint itself?
 - A. Pain while resting
 - B. Pain that increases with weight-bearing when you stand or walk
 - C. Pain when moving the leg or pelvis while in a resting position (such as lying on back and lifting leg)
 - D. All of the above
 5. Which of the following injuries MATCHES with the corresponding biomechanical abnormalities?
 - A. Medial shin pain, supinated foot
 - B. Patella tendinopathy, anterior pelvic tilt.
 - C. Achilles tendinopathy, supinated foot.
 - D. Patellofemoral syndrome, posterior pelvic tilt.
 6. The Lachman's Test is used to evaluate stability of which of the following?
 - A. Medial collateral ligament
 - B. Anterior cruciate ligament
 - C. Medial meniscus
 - D. Patellar femoral joint
 7. The most common symptoms of a stomach cramp are:
 - A. Aching and throbbing of the stomach
 - B. Breathing capacity is reduced and a headache
 - C. A sudden, sharp and severe pain to the abdomen
 - D. All of the above
 8. Groin pain can be as result of a referred pain. The most common source of pain is?
 - A. Lower lumbar spine
 - B. Sacroiliac pain
 - C. Gluteus minimus
 - D. Thoracic spine
 9. Which of the following conditions is common to runners and cyclists and is characterized by pain and irritation over the lateral femoral condyle?
 - A. Pes anserine tendonitis
 - B. Jumper's knee
 - C. Iliotibial (IT) band syndrome
 - D. Biceps femoris tendonitis

10. When an elbow is dislocated, it is important to consider the possibility of what secondary injury?
 - A. Fracture
 - B. Tearing/pinching of the nerves
 - C. Disruption of normal blood supply
 - D. All of the above
11. During this football tackle, the player in blue has collided with the lateral side of the red player's leg. What is the most likely injury to have occurred?
 - A. Medial collateral ligament injury
 - B. Lateral collateral ligament injury
 - C. Patella tendon tear
 - D. Anterior cruciate ligament
12. Which test for a syndesmosis injury has the highest sensitivity?
 - A. Squeeze test
 - B. External Rotation test
 - C. Anterior drawer test
 - D. Lachman test
13. Which of the following is NOT a sign of a shoulder injury?
 - A. Welling and bruising in the shoulder, upper arm or clavicle
 - B. The appearance of an arm being out of joint
 - C. Shoulder pain accompanied by pain in the chest
 - D. Limited range of movement
14. An 18-year-old man sustained an inversion injury of the ankle while he was playing football. An x ray of the ankle shows no fractures. Which of the following ligaments is most likely to be injured?
 - A. Anterior talofibular ligament
 - B. Anterior tibiofibular ligament
 - C. Calcaneofibular ligament
 - D. Deltoid ligament
15. Factors that must be considered in order to prevent foot injuries include:
 - A. Proper footwear
 - B. Adapting to training surfaces
 - C. Correcting biomechanical deficiencies
 - D. All of the above

SECTION B –SAQs (10 MARKS)

1. Describe the clinical exercises for phase 3 rehabilitation of an MCL injury (5 marks).
2. Describe concussion injury and its treatment in sports medicine (5 marks).

