



**AMREF INTERNATIONAL UNIVERSITY
SCHOOL OF MEDICAL SCIENCES
DEPARTMENT OF REHABILITATION MEDICINE
BACHELOR OF SCIENCE IN PHYSIOTHERAPY**

END OF TRIMESTER EXAMINATIONS AUGUST TO DECEMBER 2025

UNIT CODE: PHT 327

UNIT NAME: NEUROREHABILITATION II Main exam

DATE: 9th DECEMBER 2025

TIME: 9-11am

INSTRUCTIONS

- 1. All students will have two (2) hours to complete the examination**
- 2. This is an online exam, Attempt all questions as per the instruction**
- 3. It is the student's responsibility to report any page and number missing in this paper.**
- 4. Check that the paper is complete**
- 5. Total number of pages is 9 including the cover.**
- 6. Read through the paper quickly before you start.**

SECTION A: MULTIPLE CHOICE QUESTIONS (MCQ) 30 MARKS
FOR EACH QUESTION BELOW, CHOOSE THE BEST OPTION. EACH QUESTION IS ONE MARK

- 1 A PT receives a referral to examine the fall risk of an elderly patient with Parkinson's disease who lives alone and has had two recent falls. Which activity is the MOST common reason for falls in the elderly?
 - A. Walking with a roller walker with hand brakes.
 - B. Climbing on a step stool to reach overhead objects.
 - C. Turning around and sitting down in a chair.
 - D. Dressing while sitting on the edge of the bed.
- 2 A patient recovering from traumatic brain injury (TBI) demonstrates difficulties in feeding resulting from an unstable posture while sitting. The therapist determines that modification is necessary to ensure optimal function. What is the first body segment or segments that the therapist should align?
 - A. Trunk.
 - B. Pelvis.
 - C. Head.
 - D. Lower extremities.
- 3 The therapist is instructing a patient with traumatic brain injury (TBI) how to lock the brakes on a wheelchair. The patient is right-handed, and the right upper extremity is more affected than the left. What is the BEST motor learning strategy to use with this patient?
 - A. Have the patient practice brake locking using the left hand to assist the right.
 - B. Guide the patient's right hand through the locking motions, then the left.
 - C. Verbally talk the patient through the locking motions, practicing with both hands simultaneously.
 - D. Have the patient practice locking the brakes first with the left hand and then with the right.
- 4 A patient presents with rapidly progressive symmetrical weakness that started in the distal lower extremity muscles but now has ascended to include proximal trunk and upper extremity muscles. The motor segments of the lower cranial nerves are also showing impairment. The patient complains of abnormal sensations of tingling and burning of the affected extremities. Consciousness, cognition, and communication are all normal. These signs and symptoms are characteristic of what diagnosis?
 - A. Multiple sclerosis.
 - B. Guillain-Barre syndrome.
 - C. Amyotrophic lateral sclerosis.
 - D. Postpolio syndrome.

- 5 A patient presents with an acute onset of vertigo overnight. Symptoms worsen with rapid change in head position. If the head is held still, symptoms subside usually within 30-60 seconds. What is the MOST likely cause of these symptoms?
- A. Meniere's disease.
 - B. Benign paroxysmal positional vertigo (BPPV).
 - C. Bilateral vestibular neuritis.
 - D. Acoustic neuroma.
- 6 A patient recovering from traumatic brain injury (TBI) is unable to bring the right foot up on the step during stair climbing training. What is the BEST choice to promote independent stair climbing for this patient?
- A. Practice marching in place.
 - B. Strengthen the hip flexors using an isokinetic training device before attempting stair climbing.
 - C. Passively bring the foot up and place it on the 7-inch step.
 - D. Practice stair climbing inside the parallel bars using a 3-inch step.
- 7 A patient recovering from traumatic brain injury (TBI) is functioning at level IV on the Rancho Los Amigos Levels of Cognitive Functioning Scale (LOCF). During the therapist's initial examination, the patient becomes agitated and tries to bite the therapist. What is the therapist's BEST course of action?
- A. Postpone the examination for 1 week and then try again.
 - B. Restructure the formal examination so the therapist can complete it in three very short sessions.
 - C. Document the behaviors and engage in a calming activity.
 - D. Postpone the examination until later in the day when the patient calms down.
- 8 A patient with a complete spinal cord injury at the level of T1 (ASIA A) is in the community phase of mobility training. In order for the patient to navigate a 4-inch-height curb with the wheelchair, what should the therapist tell the patient to do?
- A. Ascend backward with the large wheels first.
 - B. Descend backward with the trunk upright and arms hooked around the push handles.
 - C. Lift the front casters and ascend in a wheelie position.
 - D. Place the front casters down first during descent.
- 9 A young, otherwise healthy, adult is recovering from a complete spinal cord injury (ASIA A) at the level of L4. What are the functional expectations for this individual?
- A. Ambulation using bilateral AFOs and canes.
 - B. Ambulation using bilateral KAFOs, crutches, and a swing-through gait.
 - C. Ambulation using reciprocating gait orthoses and a reciprocating walker.
 - D. Ambulation using bilateral KAFOs and a reciprocating walker.

- 10 A patient has a 10-year history of Parkinson's disease and has been on levodopa (Carbidopa) for the past 6 years. The patient has fallen three times in the past month, resulting in a Colles' fracture. The therapist decides to try postural biofeedback training using a platform balance training device. Which of the following is the BEST choice for a training protocol?
- A. Increase the limits of stability and improve anterior weight displacement.
 - B. Decrease the limits of stability and anterior weight displacement.
 - C. Increase the limits of stability and improve center of pressure alignment.
 - D. Decrease the limits of stability and improve posterior weight displacement.
- 11 A patient in the late stages of Parkinson's disease exhibits episodes of akinesia while walking. What should the therapist examine?
- A. Primary involvement of the head and trunk.
 - B. Associated dyskinesias.
 - C. Primary involvement of the hips and knees.
 - D. Triggers that precipitate the freezing episodes.
- 12 A young adult who is comatose (Glasgow Coma Scale score of 3) is transferred to a long-term care facility for custodial care. On initial examination, the therapist determines the patient is demonstrating decerebrate posturing. Which limb or body position is indicative of this?
- A. The upper extremities in flexion and the lower extremities in extension.
 - B. Extreme hyperextension of the neck and spine with both lower extremities flexed and the heels touching the buttocks.
 - C. All four limbs in extension.
 - D. All four limbs in flexion.
- 13 A patient with a complete tetraplegia (ASIA A) at the C6 level is initially instructed to transfer using a transfer board. With shoulders externally rotated, how should the remaining upper extremity (UE) joints be positioned?
- A. Forearms pronated with wrists and fingers extended.
 - B. Forearms supinated with wrists extended and fingers flexed.
 - C. Forearms pronated with wrists and fingers flexed.
 - D. Forearms supinated with wrists and fingers extended.
- 14 A patient is diagnosed with benign paroxysmal positional vertigo (BPPV). What intervention should the plan of care for this patient emphasize?
- A. Gaze stability exercises using horizontal head rotation (XI viewing)
 - B. Canalith repositioning treatment.
 - C. Postural stability exercises in sitting using a therapy ball.
 - D. Habituation exercises using provocative positions and movements.
- 15 Following a period of spinal shock, a patient with a complete spinal cord injury (ASIA A) at the T5 level is placed on a bladder training program coordinated by the

- nurse. A realistic ultimate outcome for this program would be independent voiding by using which of the following?
- A. The Crede maneuver.
 - B. The Valsalva maneuver.
 - C. A timed voiding program.
 - D. Suprapubic stroking or tapping.
- 16 What intervention BEST illustrates selective stretching when working with a patient with a spinal cord injury (C6 complete)?
- A. Long finger flexors are fully ranged into extension with wrist extension.
 - B. Hamstrings are fully ranged to 110 degrees in supine.
 - C. Low back extensors are fully ranged in long sitting.
 - D. Hamstrings are fully ranged in long sitting.
- 17 A patient with a 7-year history of Parkinson's disease is hospitalized. The patient is ambulatory but requires close supervision to prevent falls. What should be the focus of the physical therapist's plan of care?
- A. Manual balance perturbation training.
 - B. Transfer and wheelchair training.
 - C. Caregiver training for contact guarding during level walking and stairs.
 - D. Locomotor training using a rolling walker.
- 18 A patient with post- traumatic brain injury (Rancho Los Amigos Levels of Cognitive Functioning Scale level III) has evidence of retained secretions on auscultation and chest films. What is the BEST mode of airway clearance for this patient?
- A. Active cycle of breathing.
 - B. Autogenic drainage.
 - C. Use of the FLUTTER device.
 - D. Use of high frequency chest wall oscillation.
- 19 A physical therapist is working with a patient who exhibits fluent aphasia. What is a typical characteristic of this form of aphasia?
- A. Impaired auditory comprehension.
 - B. Slow, hesitant speech.
 - C. Good comprehension.
 - D. Impaired articulation.
- 20 What is the most effective form of diagnostic imaging for patients with multiple sclerosis (MS) to help determine level of disease activity?
- A. Positron emission tomography (PET).
 - B. Magnetic resonance imaging (MRI).
 - C. Computed tomography (CT).
 - D. Transcranial sonography.

- 21 A patient recovering from surgery to remove a cerebellar tumor presents with pronounced ataxia and problems with standing balance and postural stability. To help improve this situation, what would be BEST approach to incorporate in the intervention?
- A. Lower extremity splinting and light touch-down hand support.
 - B. Rhythmic stabilization during holding in kneeling.
 - C. Perturbed balance activities while standing on carpet.
 - D. Stabilizing reversals during holding in side-lying.
- 22 A patient with complete C7 spinal cord injury is receiving physical therapy in an inpatient rehabilitation setting to maintain joint mobility. What intervention is likely to produce the GREATEST risk of heterotopic ossification (HO)?
- A. Prolonged positioning with resting splints.
 - B. Forceful passive range of motion (PROM), especially if spasticity is present.
 - C. Prolonged stretching using tilt table standing.
 - D. Joint mobilization with PROM.
- 23 A teenager is admitted to a skilled nursing facility with a severe traumatic brain injury and marked spasticity. Cognitive function is documented at Rancho Los Amigos Levels of Cognitive Functioning Scale level IV. Family members visit on a daily basis. In this situation, it would be BEST if passive range of motion (PROM) exercises are which of the following
- A. Taught to family members in order for them to participate in the care of the patient.
 - B. Performed only by the physical therapist since the patient is unable to follow verbal commands.
 - C. Performed only by the physical therapist (PT) or physical therapist assistant (PTA) to minimize the possibility of pathological fractures.
 - D. Taught to all registered nurses (RNs) who might participate in the care for the patient.
- 24 A therapist wishes to examine the effects of fatigue on physical, cognitive, and functional performance in a patient with a 7-year history of multiple sclerosis (MS). What is the BEST instrument to use?
- A. Functional Independence Measure (FIM).
 - B. Walking ability questionnaire (WAQ).
 - C. Outcome and Assessment Information Set (OASIS).
 - D. Modified fatigue impact scale (MFIS).
- 25 As a result of diminished movement associated with rigidity in Parkinson's disease (PD), a physical therapist might employ rhythmic initiation (RI) primarily to help improve which of the following?
- A. Trunk stability and proximal tone.

- B. Trunk rotation.
 - C. Upper extremity function.
 - D. Active and passive range of motion.
- 26 A patient with a transverse spinal cord injury has total lack of hip flexion, abduction, and knee extension. This functional loss is consistent with a designation of a complete spinal cord lesion at which level
- A. L1.
 - B. L3.
 - C. L4.
 - D. L5.
- 27 A patient with postpolio syndrome (PPS) is referred to physical therapy for exercise training. The patient reports recent general fatigue and weakness along with muscle and joint pain. What is the BEST initial intervention?
- A. Treadmill training at 2 mph and a 10-degree slope, 3 days/week for 30 minutes.
 - B. Cycle ergometry at peak heart rate, 3 days/week for 40 minutes.
 - C. Therapeutic aquatics, 3 days/week for 20 minutes.
 - D. Strength training at 70% 1 RM, 2 days/week.
- 28 An elderly patient with a 5-year history of Parkinson's disease (PD) demonstrates frequent freezing of gait (FOG) episodes while ambulating. What is the BEST choice of intervention to improve gait and reduce FOG?
- A. Part-to-whole training in sequencing of required gait elements.
 - B. Walking using lightly resisted progression with elastic bands to facilitate forward progression.
 - C. Body weight support and treadmill training (BWSTI), 40% unweighting, 3% incline, at 2.7 mph.
 - D. Locomotor training using a personal listening device with 80 to 100 beats/min music.
- 29 A patient with TS paraplegia sustained 4 years ago is seen by a physical therapist at a routine outpatient clinic visit. The skin over the ischial tuberosities and sacral region is in perfect shape. The patient asks about the further need for pressure relief in the wheelchair, considering a new gel cushion is being used. What should the therapist advise the patient to do?
- A. Discontinue pressure relief as long as the gel cushion is used and visual inspection continues to reveal no skin breakdown.
 - B. Continue to perform push-ups in the chair at least once every 15 to 20 minutes.
 - C. Continue to perform push-ups in the chair at least once every 30 to 45 minutes.
 - D. Continue to perform push-ups in the chair once an hour.

- 30 A therapist wishes to use behavior modification techniques as part of a care plan to help shape the behavioral responses of a patient recovering from traumatic brain injury (TBI). What intervention is the BEST to use?
- Use frequent reinforcements for all desired behaviors.
 - Encourage the staff to tell the patient which behaviors are correct, and which are not.
 - Reprimand the patient every time undesirable behavior occurs.
 - Allow the patient to have enough time for self-correction of the behavior.

SECTION B: SHORT ANSWER QUESTIONS (SAQ)

20 MARKS.

ANSWER ALL QUESTIONS. EACH QUESTION IS 5 MARKS

- Describe five interventions that could be used to improve lower extremity (LE) extensibility in a person with multiple sclerosis (MS) who exhibits increased LE tone.
- Formulate strategies to use when a person with Parkinsons disease freezes.
- A patient who has had a TBI possesses good motor skills. She is able to walk independently without an assistive device and is able to transfer independently. The patient does exhibit occasional losses of balance. The patient's cognitive abilities are more seriously impaired. She is disoriented and has memory deficits. Design five treatment activities for this patient that incorporate physical and cognitive components
- An individual with a spinal cord injury has intact anal sensation and the following ASIA motor findings: C5: Right 5/5, Left 5/5, C6: Right 5/5, Left 5/5, C7: Right 4/5, Left 4/5, C8: Right 3/5, Left 3/5, T1: Right 1/5, Left 1/5, T2: Right 1/5, Left 1/5, L2: Right 1/5, Left 1/5, L3-S1: Right 0/5, Left 0/5.
Apply the ASIA scale to determine whether the injury is complete or incomplete.
(remember to go step by step of ASIA classification)

SECTION C: LONG ANSWER QUESTIONS (LAQS)

20 MARKS.

ANSWER ALL QUESTIONS EACH ONE IS 10 MARKS

- 28-year-old male, admitted to ICU with extensive head injury following an assault
Ventilated and sedated, though sedation is being reduced as ventilator weaning commences. Evidence of increasing tone once sedation began to be reduced, which has caused concern for staff involved in nursing interventions HPC. Decision taken to sedate

and ventilate CT scan showed diffuse injury with development of oedema. Treatment sessions are minimal due to risks associated with increasing intra-cranial pressure.

- i What would the primary problem list be for this gentleman on admission to ICU? **(3 marks)**
 - ii Prior to weaning commencing physiotherapy intervention was kept to a minimum due to concerns with increasing intra-cranial pressure. Why was this a concern for physiotherapy interventions in particular? **(2 marks)**
 - iii What difficulties could increased tone at this stage pose for long-term rehabilitation goals? **(2 marks)**
 - iv Design a program to manage increased tone from a physiotherapy perspective? **(3 marks)**
2. 45-year-old man who suffered an incomplete disruption of C3/4 following a motorbike accident was recently discharged home, ventilated and has a 24-hour package of care provided by a dedicated nursing team who all undertook an extensive training package at the regional spinal unit once appointed to their post. He contracted a chest infection 2/52 ago. Has had a full course of antibiotics but was unwell at the time and nursed in bed. Nursing staff report difficulties in achieving a good sitting posture in attendant powered wheelchair since chest infection. This has prevented participation in social activities and restricted engagement with family members. He requires full ventilatory support and regular suctioning to clear excess secretions. He is paraplegic and reports being able to feel pain though unable to localise. On assessment, full range of movement available at shoulders and elbows, though distal increase in tone noted toward end of range.
- i Why does this patient require full ventilatory support? **(3 marks)**
 - ii Detailed assessment had to be postponed due to concerns with increasing blood pressure. Why is this a concern for this gentleman? **(3 marks)**
 - iii Formulate four goals for your treatment be **(4 marks)**