

**ROYAL CIVIL SERVICE COMMISSION
BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2020
EXAMINATION CATEGORY: TECHNICAL**

PAPER III: SUBJECT SPECIALISATION PAPER FOR PHYSIOTHERAPY

Date	: February 27, 2021
Total Marks	: 100
Writing Time	: 150 minutes (2.5 hours)
Reading Time	: 15 minutes (prior to writing time)

GENERAL INSTRUCTIONS:

1. Write your Registration Number clearly and correctly on the Answer Booklet.
2. The first 15 minutes is to check the number of pages of the Question Paper, printing errors, clarify doubts and to read the instructions. You are NOT permitted to write during this time.
3. This paper consists of **TWO SECTIONS**, namely SECTION A & SECTION B:
 - **SECTION A** has two parts: Part I - 30 Multiple Choice Questions
Part II - 4 Short Answer Questions
All questions under SECTION A are COMPULSORY.
 - **SECTION B** consists of two Case Studies. Choose only **ONE** case study and answer the questions of your choice.
4. All answers should be written on the Answer Booklet provided to you. Candidates are not allowed to write anything on the question paper. If required, ask for additional Answer Booklet.
5. All answers should be written with correct numbering of Section, Part and Question Number in the Answer Booklet provided to you. Note that any answer written without indicating the Section, Part and Question Number will NOT be evaluated and no marks will be awarded.
6. Begin each Section and Part on a fresh page of the Answer Booklet.
7. You are not permitted to tear off any sheet(s) of the Answer Booklet as well as the Question Paper.
8. Use of any other paper including paper for rough work is not permitted.
9. **You must hand over the Answer Booklet to the Invigilator before leaving the examination hall.**
10. This paper has **10 printed pages**, including this instruction page.

GOOD LUCK!

SECTION A

PART I: Multiple Choice Questions [30 marks]

Choose the correct answer and write down the letter of your chosen answer in the Answer Booklet against the question number e.g. 31 (d). Each question carries ONE mark. Any double writing, smudgy answers or writing more than one choice shall not be evaluated.

1. A patient is scheduled for decompressive lumbar laminectomy due to significant lumbar radiculopathy. After the surgery, the physiotherapist encourages all of the following activities EXCEPT
 - a) Basic mobility activities
 - b) Immobilization
 - c) Proper body mechanics
 - d) Back safety techniques

2. A physiotherapist is treating an elderly patient admitted in the acute care ward. The patient is maintained on pain medications and diuretics. Before starting an exercise session, the patient complains of fatigue, leg cramps and palpitations. The therapist suspects that these signs and symptoms are indicative of
 - a) Arterial claudication
 - b) Hyperglycemia
 - c) Hypokalemia
 - d) Deep vein thrombosis

3. A physiotherapist is conducting a respiratory assessment on a patient before starting an exercise session. On auscultation, the therapist notes loud, high-pitched sounds over the sternum. The breath sound is identified as which of the following?
 - a) Vesicular
 - b) Bronchovesicular
 - c) Bronchial
 - d) Tracheal

4. On gait assessment and balance evaluation, the patient keeps the knee extended at heel strike and through the stance phase. Knee flexion is reduced. The movement into full knee extension snaps at the affected knee back. This finding indicates that the patient has
 - a) ankle dorsiflexion weakness.
 - b) quadriceps weakness.
 - c) hip extensor weakness.
 - d) knee flexion contracture.

5. A physiotherapist is evaluating a patient with coronary artery disease and stable angina is referred for an exercise program. Which of the following risk factors is noted for coronary artery disease?
 - a) Female gender
 - b) BMI of 28
 - c) Average blood pressure of 140/90 mm Hg
 - d) Diabetes mellitus

6. A physiotherapist is assessing the respirations of a female patient with neurological deficits. The therapist notes irregular respiratory patterns with pauses at the end of inspiration and expiration. This finding indicates dysfunction in which of the following parts of the brain?
 - a) Cerebral hemisphere
 - b) Medulla
 - c) Pons
 - d) Basal ganglia

7. A patient with history of head trauma is assessed using the Glasgow Coma Scale. The patient is able to localize painful stimulus, verbally respond in confused conversations, and open eyes in response to sound. The patient's GCS score is
 - a) 10
 - b) 11
 - c) 12
 - d) 13

8. A physiotherapist is assessing a patient who has had a stroke. A significant part of the evaluation consists of assessment of the ability to perform functional tasks. When assessing mobility, the therapist evaluates for the following EXCEPT
 - a) Ability to ambulate on various surfaces.
 - b) Ability to get on and off the floor.
 - c) Sitting and standing balance.
 - d) Definition of required word assistance.

9. A 50-year-old female evaluated for chronic pain in the lower back, weakness, and numbness in the legs during walking. The symptoms are usually resolved by rest. Bending forward diminishes the pain. On physical examination the patient is noted for wide-based gait, abnormal Romberg test, and thigh pain after 30 seconds of lumbar extension. The patient is positive for the stoop test and negative for straight leg raise test. Based on these assessment findings, the patient is most likely diagnosed with
 - a) lumbar spinal stenosis.
 - b) lumbar disc herniation.
 - c) arthritis of the spine.
 - d) intermittent claudication due to arterial disease.

10. A patient with nerve injury had a surgery that involved direct reconnection of the divided peripheral nerve. The physiotherapist is aware that the signs and symptoms on motor and sensory recovery follow a particular sequence and duration of time. The therapist expects
 - a) motor recovery of the distal muscles before motor recovery of the proximal muscles.
 - b) motor recovery before sensory recovery.
 - c) return of voluntary control before muscle response to faradic stimulation.
 - d) deep cutaneous sensibility as the first sign of sensory recovery.

11. A patient who complains of leg pain while walking is being evaluated. The pain is often relieved by rest and bending forward. The physiotherapist suspects lumbar stenosis. Which of the following tests is most likely initially ordered for the patient?
 - a) Magnetic resonance imaging
 - b) Plain radiography
 - c) CT scan
 - d) Nuclear imaging

12. A female patient reports brief and paroxysmal facial pain, which is described as severe in intensity and stabbing in quality. The pain typically starts on one side of the cheek and then radiates to the jaw, top lip, teeth and gums, and to the side of the nose. The pain is usually triggered by vibration, light touch, and face washing. The patient is most likely diagnosed with
 - a) facial nerve palsy.
 - b) temporomandibular joint disorder.
 - c) trigeminal neuralgia.
 - d) migraine.

13. A 35-year-old male involved in a motorcycle accident is diagnosed with a complete spinal cord injury involving T5-T6. The patient asks if he can still have erection. Which of the following is informed to the patient?
 - a) An erection is not possible with direct stimulation of the genitalia and cognitive stimulation.
 - b) An erection is possible with direct stimulation of the genitalia and cognitive stimulation.
 - c) An erection is only possible with direct stimulation of the genitalia.
 - d) An erection may occur with mental images, but not with direct stimulation of the genitalia.

14. A patient admitted due to myocardial infarction is referred for cardiac rehabilitation. The program is divided into four stages and the physiotherapist is administering passive range of motion exercises. In which phase of cardiac rehabilitation is the passive range of motion interventions administered to the patient?
 - a) Acute phase
 - b) Convalescent phase
 - c) Training phase
 - d) Maintenance phase

15. A patient sustained trauma to the chest complains of pain that increase with inspiration. Shallow respirations are noted. A rib fracture is considered. Which of the following interventions is the most appropriate for the patient?
 - a) Instruct the patient to self-splint with hands and arms.
 - b) Oxygen administration.
 - c) Mechanical ventilation with PEEP.
 - d) Encourage coughing.

16. When suctioning the patient, the following actions by the physiotherapist ensure safety and maximal benefit of the therapy EXCEPT
 - a) Use of sterile technique.
 - b) Suctioning intermittently for 10 seconds.
 - c) Lubricating the catheter with sterile water before suctioning.
 - d) Application of suction when inserting the catheter.

17. A physiotherapist is treating a patient who has had a stroke. One assessment, shoulder subluxation and pain in the affected arm are noted. Which of the following interventions is LEAST likely implemented to manage the affected shoulder?
- Active weight bearing exercises
 - Passive range of motion exercises
 - Functional electrical stimulation
 - Reciprocal pulley
18. A patient who is diagnosed with lumbar disk herniation is referred to the clinic for a therapy program. A review of patient record reveals signs of lumbar radiculopathy. The physiotherapist is correct to include which of the following activities to the program?
- Bed rest for the first 5 days.
 - Encourage flexion bias.
 - Limit sports-specific plyometrics.
 - Maintenance of neutral spine position.
19. An injury involving the medial collateral ligament is suspected. On valgus stress test, a laxity of 7 mm is noted. Which of the following interventions is LEAST likely implemented to the patient?
- Bracing with short-hinged knee orthosis that blocks 20-degrees of terminal extension but allows full flexion.
 - Initial non-weight bearing on the affected extremity.
 - Crutches for the first few days.
 - Closed-chain exercises.
20. Which of the following treatment approaches mainly focuses on the execution of diagonal, spiraled patterned movements to improve muscle strength and enhance neuromuscular control?
- Neurodevelopmental treatment
 - Proprioceptive neuromuscular facilitation
 - Brunnstrom's movement
 - Muscle re-education approach
21. Slower the rate of temperature decay is more effective for the application of manual therapies especially to increase the flexibility of tissues. Which of the following modalities has slower rate of temperature decay following its application?
- Ultrasonography
 - Moist heat packs
 - Infrared radiation
 - Pulsed shortwave diathermy
22. A physiotherapist conducts sensory testing, mainly through light touch and pain sensation, on a patient with motor and sensory deficits. The therapist ensures to include which of the following areas in the test to determine whether or not patient has a motor incomplete injury?
- Medial aspect of the dorsum of the foot
 - Anal sphincter
 - Posterior aspect of the thigh
 - Groin

23. Pain description is an essential part of the patient's history. During pain evaluation, the location of pain extension, on-set, frequency, progression, intensity, and aggravating or relieving factors are noted. Which of the following pain measurements uses a number, such as a 0 to 5 or 0 to 10, to reflect the decreasing or increasing degrees of pain?
- The Visual Analog Scale
 - Verbal Rating Scale
 - Numerical Rating System
 - Wong-Baker FACES Pain Rating Scale
24. A 3-month-old child who tested positive for Ortolani and Barlow tests is referred to the physiotherapist. The physiotherapist reviews the patient's record, expecting to note which of the following details of information in the patient history?
- The child is delivered in breech position.
 - The child's posterior shoulder got caught on its mother's sacrum during birth.
 - The therapist is treating a male child.
 - The child's mother has record of G3P3.
25. Which of the following statements is TRUE with respect to 'specificity' of a test?
- Ability of test to correctly identify patients with a disease.
 - Ability of a test to correctly identify patients without diseases.
 - Identify false positive.
 - Identify false negative.
26. Baclofen is a drug prescribed commonly to treat which of the following conditions?
- Gastric spasm
 - Muscle strain
 - Muscle spasticity
 - Chronic pain
27. Taylor brace is a spinal orthosis donned by the patient to protect the spine. A compression fracture at which of the following level will the Taylor brace be most appropriate?
- C1-C7
 - T1-T6
 - T7-L2
 - L3-S1
28. Aspirin fall into which class of antithrombics?
- Thrombolytics
 - Platelet aggregator inhibitors
 - Anticoagulants
 - Fibrinolytics

29. A female patient with low back pain comes to physiotherapy clinic. She also complains of having a rise in her body temperature. Her blood investigation shows a total white count of 15000 per microliter with raised neutrophils. Her urine report shows numerous white blood cells. From these reports, you suspect that the patient is most likely to have
- low back pain.
 - acute low back pain.
 - probable urinary tract infection.
 - pelvic girdle pain.
30. Which of the following arterial blood gas values is MOST indicative of respiratory alkalosis?
- PaO_2 80 mmHg
 - PaO_2 100 mmHg
 - $PaCO_2$ 25 mmHg
 - $PaCO_2$ 45 mmHg

PART II – Short Answer Questions [20 marks]

This part has 4 Short Answer Questions. Answer ALL the questions. Each question carries 5 marks. Mark for each sub-question is indicated in the brackets.

- Write a short note on cardiac rehabilitation. (1+4 marks)
- Write a short note on clubfoot deformity – describe the deformities. Explain the management process and sequence of corrections. (2+3 marks)
- For therapeutic exercises to be effective, specific parameters must be followed sequentially. Write a short note on sequence of flexibility and range of motion; strength and muscle endurance; and proprioception, coordination, and agility. Explain each sequence in brief and provide rationale for the sequence, and state what will indicate you to move to the next sequence. (1+3+1 marks)
- Write a short note on phases of tissue healing. Mention and provide rationale for two electrotherapy modalities that you will use in each phase of healing. (2+3 marks)

SECTION B: CASE STUDY [50 marks]

Choose either CASE I or CASE II from this section. Each case study carries 50 marks. Mark for each sub-question is indicated in the brackets.

CASE I

A 35-year-old male patient is admitted in the National Referral Hospital with complaints of left sided weakness for 3 days. He was referred from Sarpang district hospital. He was recently diagnosed with hypertension and has a habit of smoking and taking alcohol. There is no significant medical and surgical history. The Magnetic Resonance Imaging (MRI) finding showed ischemic infarct in the right capsulo-ganglionic region. Other investigations of electrocardiogram (ECG) and echocardiogram (ECHO) were unremarkable and lab investigations in the blood showed increased liver functions test (LFT).

Upon Neurological Examination, the GCS was 15/15, left sided weakness, dysphagia, slurred speech and without any signs of inattention and cognitive disorders. The rehabilitation assessment showed the following: NIHSS of 8/44, modified Rankin Scale: 4, MOCA: 30/30 and modified Barthel index of 55/100. The BBS was 38/56, Truck control test of 25/25 and FMA of 2/36 for UE and 26/28 for LL. The rehabilitation was initiated with Physiotherapy and Occupational therapy on the 4th day which consisted of one hour per session for four days until the patient was discharged from hospital with a plan for rehabilitation to be continued at Phuntsholing district hospital, where his daughter stayed.

1. Provide and define the medical diagnosis for the above patient. (1+2 marks)
2. Mention four modifiable and four non-modifiable risk factors of stroke. (2+2 marks)
3. Correlate the region of brain affected and clinical symptoms shown by the patient. (4 marks)
4. Differentiate between the clinical presentation of thrombotic, embolic and hemorrhagic stroke?
(2+2+2 marks)
5. Explain the terms lacunar infarct and TIA in Stroke. (1+1 marks)
6. Explain the anatomy of the Internal Capsule with the help of a diagram. (5 marks)
7. List three significant impairments of the patient. (3 marks)
8. What is NIHSS (National Institute of Health Stroke Scale) used for? Explain its use in Stroke management. (1+1 marks)
9. The mRS scale mentioned measures 4/6. What is the level of disability in this patient? (2 marks)
10. If the trunk control test measured 53/100, how can you improve it? (2 marks)
11. Explain the Brunstrooms stage of Motor Recovery and Explain Physiotherapy Interventions during each stage. What stage of recovery does this patient fall into? (6+1 marks)
12. Define Neuroplasticity. Describe the principles for neuroplasticity that you will use to rehabilitate this patient. (1+4 marks)
13. Mention three assistive products this patient need and why? (3 marks)
14. Mention four major Brodmann's areas of brain. (2 marks)

CASE II

A 60-year-old female presents with history of a left rib fracture 8 weeks ago while she was sleeping. She reports a history of osteoporosis as well as insulin-dependent diabetes. Her side no longer hurts, yet she complains of a diffuse aching left shoulder pain by day and wakes her up at night, especially when she rolls onto the shoulder. When asked, she reports that she is unable to sleep on her left side. Pain is vaguely reported over the area of the deltoid muscle. Dressing and grooming have become nearly impossible because of the pain. There is no complaint of pain to the neck, upper back, elbow, or hand. She complains she can no longer unbuckle her brassiere from behind and has lot of difficulty in tightening the *keras* (belt) though she can perform most functional activities with her right dominant upper extremity.

Observation: her left arm appears close against her body in the position of shoulder internal rotation, adduction, and elbow flexion. When she is asked to elevate her left shoulder, she appears to hike her shoulder upward approximately 40 degrees. There is a slight muscle wasting observed over the bellies of the musculocutaneous cuff musculature. **Palpation:** there is a point tenderness present over the bicipital groove. **Active and passive movements:** an empty end feel is appreciated. Specific ranges are difficult to measure because of the gross limitation of left shoulder movement in virtually all ranges. Approximate ranges are as follows: external rotation (ER) = 45 degrees, abduction = 80 degrees, and internal rotation (IR) = 70 degrees. **Joint play:** anterior and inferior glide are particularly limited, as is lateral distraction. The scapulothoracic joint feels partially bound because retraction and protraction are grossly limited to one half their normal range as compared to the contralateral scapula. **Resistive testing:** left shoulder yields pain when reaching the end range but no pain at mid-range. **Sensation:** normal. **Reflex:** normal. **Arthrogram** of the left shoulder showed a reduced volume of the left glenohumeral joint capsule as well as inapparent axillary fold and biceps brachii sheath.

1. What disorder is most likely affecting this patient? (1 mark)
2. How is this disorder classified? In which category does this woman fall into and why?
(1+1+2 marks)
3. List the anatomical structures that form shoulder joint and its peri-articular structure. (4 marks)
4. Infer from the case above the epidemiological characteristics of this disorder. (4 marks)
5. Explain in brief the distinct stages of this disorder. What stage of the disorder is this patient in?
(6+1 marks)
6. List signs and symptoms of the disorder from the case above. (4 marks)
7. Why would this woman demonstrate a reverse scapulothoracic rhythm of movement? (2 marks)
8. List six differential diagnoses of this case. (3 marks)
9. Describe in brief how you will rule out pathologies in the neck and cervical spine. (2 marks)
10. List the manual therapies, electrotherapy modalities, and analgesics that you will administer to alleviate the pain in this patient. (2+2+2 marks)

11. As evident from the arthrogram and the limited joint play, the capsule and surrounding structures have become tightened. Choose the best electro-modality to increase the tissue extensibility. Describe the method of administration of the modality chosen on this patient. Mention the dosage parameters of the modality administration. (1+5 marks)
12. List three simple exercise programs that you would advise to this patient to perform at home on her own. (3 marks)
13. List the function of rotator cuff muscles. List the position of the patient that you will put her on, for each rotator cuff muscle strengthening program against gravity. (4 marks)

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