

**ROYAL CIVIL SERVICE COMMISSION  
BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2016  
EXAMINATION CATEGORY: TECHNICAL**

**PAPER III: SUBJECT SPECIALIZATION PAPER FOR PHYSIOTHERAPY**

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Date: 2 October 2016  
Total Marks: 100  
Examination Time: 150 minutes (2.5 hours)  
Reading Time: 15 minutes (*prior to examination time*)

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**GENERAL INSTRUCTIONS**

1. Write your Registration Number clearly and correctly on the Answer Booklet.
2. The first 15 minutes is being provided to check the number of pages, printing error, clarify doubts and to read instructions in Question Paper. You are NOT permitted to write during this time.
3. This paper consists of **TWO Sections, namely Section A and 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 2 case studies. Choose only **ONE** case study and answer the questions under 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 correct Section, Part and Question Number will NOT be evaluated and no marks would be awarded.
6. Begin each Section and Part in 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 are required to hand over the Answer Booklet to the Invigilator before leaving the examination hall.
10. The Question 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 (c). Each question carries ONE mark. Any double writing, smudgy answers or writing more than one choice shall not be evaluated.**

1. A patient with a stroke affecting the right middle cerebral artery has difficulty walking, especially over uneven surfaces. Which of the following describes the MOST appropriate initial treatment to improve the patient's ability to walk over uneven surfaces?
  - a. Place a single point cane in the patient's left hand and train him to use a step-to gait pattern.
  - b. Place a single point cane in the patient's right hand and train him to use a step-to gait pattern.
  - c. Fit the patient with a 4-wheeled walker and instruct him to use a 4-point gait pattern.
  - d. Fit the patient with axillary crutches and instruct him to use a 4-point gait pattern.
  
2. A physiotherapist is evaluating a 66 year old female who has a history of severe head trauma following a motor vehicle accident. The patient has difficulty with rapid alternating movements while performing neurologic testing. The BEST term to describe this specific impairment is
  - a. Ataxia
  - b. Dysmetria
  - c. Dysarthria
  - d. Dysdiadokokinesia
  
3. A 30 year old male presents to outpatient rehabilitation with numbness and tingling on the 4th and 5th fingers of the left hand consistent with nerve entrapment symptoms. Upon further examination, it is noted that the patient has normal sensation on the dorsum of the hand on the ulnar side. Where is the MOST likely source of nerve entrapment?
  - a. Guyon's Canal
  - b. Carpal Tunnel
  - c. Cubital Tunnel
  - d. 1st Rib
  
4. A 45 year old male presents to the burn unit with partial thickness burns over the entire right arm, left arm, front of head, and front of chest. Approximately what percentage of his body is burned?
  - a. 31.5%
  - b. 36%
  - c. 40.5%
  - d. 45%

5. A patient presents to the inpatient rehabilitation unit who has suffered a vertebro-basilar CVA and has difficulty depressing the eye from an adducted position. Which cranial nerve is the MOST likely cause of this impairment?
  - a. CN I
  - b. CN II
  - c. CN III
  - d. CN IV
  
6. A 59 year old male patient is being evaluated for left shoulder pain. The patient reports that his shoulder pain is closely associated with activity, including stress at work. The patient reports that at worst, the pain radiates into his neck, and he feels shortness of breath which subsides with rest. What would the MOST appropriate intervention be?
  - a. Begin passive range of motion exercises within the pain free range of motion.
  - b. Postpone treatment and refer the patient to his physician for further evaluation.
  - c. Apply modalities to the shoulder and instruct the patient on activity modification.
  - d. Begin the patient with rotator cuff exercises within the pain reduced range of motion and instruct patient on activity modification.
  
7. A geriatric patient with “walking” pneumonia and a history of recent falls is receiving physiotherapy for general strengthening. What part of this person’s treatment is affected MOST by his lung condition?
  - a. Decreased stamina/tolerance of activity.
  - b. Inability to participate in endurance type activities.
  - c. Diminished tidal volumes.
  - d. Lower oxygen saturation with moderate activity.
  
8. A physiotherapist is evaluating a 50 year old patient with a generally swollen right leg. The patient does not report any trauma to the leg and describes the swelling as increasing gradually over the last 12 months. The swelling is non-pitting, primarily below the knee. The leg is not red or hot, and the patient indicates that his leg just feels “heavy.” What is the MOST likely origin of the swelling?
  - a. Systemic infection
  - b. Chronic inflammation
  - c. Congestive heart failure
  - d. Lymphedema
  
9. A physiotherapist is evaluating a patient with pain that radiates throughout his lower extremities. The patient has significant foot drop while ambulating and complains of numbness and tingling extending from the great toe up to the knee along the anterior leg. What is the MOST likely pathology underlying these symptoms?
  - a. Sciatic nerve entrapment
  - b. Deep peroneal nerve inflammation
  - c. Tibial nerve entrapment
  - d. L5 nerve root entrapment

10. A patient with cystic fibrosis is receiving postural drainage and percussion for the right lung's middle lobe. What is the MOST appropriate patient position?
  - a. Supine on a wedge with the left shoulder elevated on pillows with the head lower than the pelvis.
  - b. Supine on a wedge with the right shoulder elevated on pillows with the head lower than the pelvis.
  - c. Prone with the right shoulder elevated on pillows and the head on the same plane as the pelvis.
  - d. Prone with the left shoulder elevated on pillows and the head on the same plane as the pelvis.
  
11. A physiotherapist is performing a treadmill exercise stress test using the Bruce protocol. During stage 3 of the test, the P wave increases in height and the S-T segment begins to become significantly upsloping. What is the MOST appropriate course of action?
  - a. Stop the test and refer patient to a physician.
  - b. Lower the stage back to stage 2 and monitor for improved electrocardiographic indicators.
  - c. Continue with the test without any modification, monitoring for symptoms of cardiac distress.
  - d. Discontinue the test, and monitor the patient's vital signs for 10 minutes.
  
12. A patient is receiving cardiac rehab and has a heart rate of 110 during moderate intensity exercise. The patient reports a 16 on the Borg RPE scale. Which class of heart medications is MOST likely present?
  - a. Beta Blockers
  - b. Angiotensin-Converting Enzyme (ACE) Inhibitors
  - c. Calcium Channel Blockers
  - d. Angiotensin II Receptor Blockers
  
13. A 12 year old male athlete is being evaluated by a physiotherapist. The patient reports pain with running and has a sharp pain over the patellar tendon, particularly on the tibial tubercle. Which of the following disorders is MOST likely present?
  - a. Legg-Calvé-Perthes' disease
  - b. Chondromalacia patellae
  - c. Osgood-Schlatter disease
  - d. Pes anserine bursitis
  
14. A patient presents with rheumatoid arthritis and finger pain. The 2nd digit has a flexed metacarpophalangeal joint, hyperextended proximal interphalangeal joint, and a flexed distal interphalangeal joint. Which of the following is the MOST accurate description of the position?
  - a. Swan neck deformity
  - b. Boutonniere deformity
  - c. Mallet finger deformity
  - d. De Quervain syndrome

15. After sustaining a traumatic brain injury, a patient presents to physiotherapy with symptoms consistent with damage to the amygdala, hippocampus, and thalamic nuclei. Which of the following symptoms will MOST likely be present in this individual?
- Impaired fine motor skills, including ataxia
  - Disrupted vision, hearing, and sensation to the face/tongue
  - Hemiparesis, with the upper extremity more affected than the lower extremity
  - Lack of behavior control and memory difficulties
16. According to the American Red Cross, what is the appropriate ratio of chest compressions to rescue breaths for infants during single rescuer cardiopulmonary resuscitation (CPR)?
- 15 compressions: 2 breaths
  - 20 compressions: 2 breaths
  - 25 compressions: 2 breaths
  - 30 compressions: 2 breaths
17. While auscultating a patient's lungs, the therapist note a harsh, high-pitched wheezing sound emanating from the patient's upper bronchi during inspiration. Which of the following abnormal breath sounds is MOST likely present?
- Stridor
  - Wheeze
  - Crackle
  - Rhonchi
18. In the daily SOAP note documentation of a physical therapy treatment session, which of the following categories will contain the patient's complaints?
- Subjective
  - Objective
  - Assessment
  - Plan
19. A physiotherapist chooses to use therapeutic ultrasound for deep heating of the quadriceps muscle. Which set of ultrasound parameters will be MOST effective at increasing the temperature of tissue 3.0 centimeters deep?
- 1.0 MHz, 1.5 W/cm<sup>2</sup>, 50% duty cycle
  - 3.0 MHz, 1.5 W/cm<sup>2</sup>, 100% duty cycle
  - 1.0 MHz, 1.5 W/cm<sup>2</sup>, 100% duty cycle
  - 3.0 MHz, 1.5 W/cm<sup>2</sup>, 50% duty cycle
20. A 30 year old patient is recovering from an ankle fracture has instructions from the surgeon to ambulate with partial weight bearing on the involved extremity. Which of the following assistive devices would be MOST appropriate for this patient to facilitate ambulation?
- Single point cane
  - Four wheeled-walker
  - Lofstrand crutches
  - Knee scooter

21. According to Maslow's Hierarchy of Needs, which of the following is the UPPERMOST level of self-actualization?
- Affiliative needs
  - Physiological needs
  - Esteem needs
  - Psychosocial needs
22. Which of the following activities MUST be performed by a licensed physiotherapist?
- Implement components of patient interventions
  - Modification of the plan of care
  - Make modifications to patient interventions
  - Document progress made by the patient
23. A 12 year old boy with spina bifida occulta is receiving physiotherapy for bilateral leg weakness and difficulty walking. Which of the following will be the MOST important consideration when developing a plan of care for this patient?
- Train the patient in the use of appropriate adaptive equipment.
  - Provide training to upper body muscles to promote independence.
  - Provide exercises to increase tone in the legs and become as independent as possible.
  - Train the patient to use crutches to allow for more active participation in socially appropriate activities.
24. A patient is having difficulty maintaining his balance during static standing, especially in crowded environments. Which of the following balance strategies is the most active during this activity?
- Ankle strategy
  - Hip strategy
  - Suspensory strategy
  - Stepping strategy
25. When using the parallel bars for gait training, what is the appropriate adjustment of height that will optimize stability and security for the patient?
- A height that allows for elbow flexion of approximately 0 degrees.
  - A height that allows for elbow flexion of approximately 10 degrees.
  - A height that allows for elbow flexion of approximately 15 degrees.
  - A height that allows for elbow flexion of approximately 20 degrees.
26. Which of the following is the BEST reason for pregnant women to avoid high intensity exercise?
- Decreased cardiac output
  - Decreased oxygen availability
  - Morphological changes to the abdominal muscles
  - Preferential blood flow to working muscles

27. When treating a patient with Human Immunodeficiency Virus (HIV), which of the following is the MOST important consideration?
- Thoroughly disinfect all surfaces touched by the individual.
  - Treat the patient in a private room and avoid contact with other patients.
  - Use protective equipment when in contact with blood products.
  - Reduce workloads and use primarily low-impact drills to avoid stress on weight-bearing joints.
28. A female patient is having difficulty with stress urinary incontinence and is seeking treatment from a physiotherapist. Which of the following treatment options will be MOST effective at decreasing the bouts of incontinence?
- Perineal strengthening exercises
  - Limit fluid intake to 8 oz. every 4 hours
  - Instruct the patient to avoid stressful situations
  - Gluteal strengthening exercises
29. During an exercise stress test, a patient begins to display large, irregular ECG signals that are turbulent and asynchronous. Which of the following conditions is MOST likely present?
- Premature ventricular contraction
  - Ventricular fibrillation
  - Ventricular tachycardia
  - Ventricular asystole
30. A patient has just received the results of a recent blood test. Which of the following blood chemistry values would be the cause for greatest concern?
- Triglycerides 110 mg/dL
  - Total cholesterol 120 mg/dL
  - HDL cholesterol 100 mg/dL
  - LDL cholesterol 90 mg/dL

**PART II – Short Answer Questions (20 marks).**

**This part has 4 Short Answer Questions. Answer ALL the questions. Each question carries 5 marks.**

- Write the difference between Contracture and Deformity, and explain pathomechanics of a Rocker Bottom Feet Deformity in a child with cerebral palsy. (1+1+3)
- Draw a diagram of two to three levels of spinal segments and tracts to illustrate ipsilateral motor loss and contralateral pain and temperature loss in a brown sequard syndrome. (2.5+2.5)
- Mention 5 cardiovascular response and 5 respiratory response to aerobic exercises. (2.5+2.5)
- Write a note on Forced Expiration Technique as means of assisting removal of excess bronchial secretions form the airway. (2.5+2.5)

## SECTION B

### Case Study

Choose either Case 1 or 2 from this section. Each case study carries 50 marks.

#### Case 1

A 32 year-old female participated in a party during a cold evening that brought on the first frost of the winter season. A candlelight party was held until the wee hours of the morning during which the wind intensified the cold. She wore no scarf or earmuffs. At dawn she went home to sleep for 5 hours and woke up with a pain in her left cheek. Upon looking in the mirror she was horrified to view her face grossly misshapen on one side. She immediately went to the emergency room at the local hospital. The physician diagnosed her as having Bell's palsy and referred her for therapy. When asked, the patient admits waking up in the morning and finding her pillow wet from saliva having drooled out of the left side of her mouth during sleep. Obvious facial asymmetry is observed, and the ipsilateral forehead appears flattened and lacking normal skin creases. Muscle testing revealed less than fair strength in the following muscles: occipitofrontalis, frontalis, orbicularis oculi, zygomaticus major, corrugator, buccinator, mentalis, and platysma. Sensory testing revealed loss sweet and salty taste in the anterior two thirds of the tongue. There is a positive Bell's sign.

- a) What is acute idiopathic facial palsy? (5 marks)
- b) Mention five clinical characteristics of Bell's palsy. (5 marks)
- c) Write a note on anatomy of facial nerve. (5 marks)
- d) How does the facial palsy of the upper motor neuron type differ from Bell's palsy, which is of the lower motor neuron type? Illustrate with diagrams. (5 marks)
- e) If a patient had sustained right cerebrovascular accident with upper motor neuron injury of the right facial nerve nucleus, the facial paralysis will be on which quadrant of the face and why? (1+1 marks)
- f) Write a note on corneal blink test – what is it? What are afferent and efferent nerves involved in the reflex? How do you elicit it? What will be the response in Bell's palsy and upper motor neuron facial palsy? (1+2+1+2 marks)
- g) What is the medical management of Bell's palsy? (1+1 marks)
- h) Describe the physiotherapy management plan for this patient with clinical reasons attached. (5 marks)
- i) Gross facial exercises are found inadequate to manage Bell's palsy, what neuromuscular retraining (NMR) will you use for this patient? (5 marks)
- j) What is the method of NMR? (3 marks)
- k) What are the two categories of motor disturbance that facial paralysis is classified into and what will be your goals? (2+2 marks)
- l) Will you use electrical stimulation for this patient? Why? Why not? (3 marks)

**OR**

**Case 2**

A 28-year-old female complains of severe left ischial pain with sciatic radiation for 5 months duration. Her ischial pain has not decreased in intensity since the onset of symptoms nor has pain radiation progressed further distally than when symptoms appeared. A history of fall in which she struck her left buttock along the edge of a carpeted stairway 2 months before onset while carrying a heavy object only after much memory dragging. She describes in details how she was “black and blue” for 3 weeks on her left buttock. Since the onset of symptoms she has undergone an extensive medical work-up, including magnetic resonance imaging and computerized tomography that scored negative for lumbosacral radiculopathy. The patient reports exacerbation of pain on sitting or standing, and relief when lying. Despite her pain, the patient consistently exercises on a stair-climbing machine for 30 minutes per day.

**Observation** – a miserable malalignment of the lower extremities is observed in both lower extremities as excessive femoral internal rotation, lateral tibial torsion, and over-pronated feet.

**Palpation** – extreme tenderness over the buttock area between the ischium and greater trochanter.

**Active range of motion** – within functional limits

**Passive range of motion** – painless internal rotation

**Strength** – hamstring muscle strength is graded at G- (less than good)

**Flexibility** – mild to moderate tightness of left medial hamstrings

**Selective tension** – pain on resistive external rotation and hip extension on the left

**Girth measurement** – left calf muscles atrophy by one third compared to other side

**Sensation** – decreased sensation over entire peripheral sciatic distribution

**Deep tendon reflexes** – a 1+ for patellar, hamstrings, and calcaneal tendon reflexes

**Special tests** – positive straight leg raise test

- a) What is the cause of this woman’s symptoms? (1 mark)
- b) From the case history what is the potential cause of piriformis syndrome for this woman. Mention three additional aetiology of piriformis syndrome. (1+3 marks)
- c) What is the anatomy of the sciatic nerve in relation to the piriformis? (3 marks)
- d) What are the short rotators of the hip joint and what is their functional anatomy during open and closed kinetic chain function? (2.5+2.5 marks)
- e) Mention 3 components of miserable malalignment syndrome. (3 marks)
- f) What is the clinical presentation of piriformis syndrome? (5 marks)
- g) What is myotome? Write or illustrate myotome supply from L1 to S1 (1+4 marks)
- h) Write or illustrate the roots of deep tendon reflexes – patellar, adductor, posterior tibial, Achilles tendon (4 marks)
- i) Mention 5 differential diagnosis for this patient with piriformis syndrome (5 marks)
- j) Write the differentiating clinical features between intervertebral disc prolapse and spinal canal stenosis. How will your intervention differ for the two? (2+2+2 marks)

- k) What is your choice of modality to treat piriformis syndrome and why? (1+2 marks)
- l) What therapeutic exercises will you administer to correct miserable malalignment syndrome in this woman? (3 marks)
- m) What type of orthoses will you recommend to correct forefoot varus deformity? (1 mark)
- n) Mention clinical features of cauda equina syndrome? (2 marks)

\*\*\*TASHI DELEK\*\*\*