AMREF INTERNATIONAL UNIVERSITY

SCHOOL OF MEDICAL SCIENCES

DEPARTMENT OF REHABILIATION MEDICINE

BACHELOR OF SCIENCE IN PHYSIOTHERAPY

END OF EXAMINATIONS JANUARY TO APRIL, 2026

UNIT CODE: PHT 133

UNIT NAME: REGIONAL ANATOMY OF THE HEAD, NECK AND THORAX

DATE: 9th April 2026 TIME: START-9:00am-STOP-: 11:00am

All students will have two (2) hours to complete the examination

1. **Attempt all questions as per the instruction**
2. **It is the student's responsibility to report any page and number missing in this paper.**
3. **Check that the paper is complete**
4. **Total number of pages is 10 including the cover.**
5. **Read through the paper quickly before you start.**

SECTION ONE; Multiple Choice Questions.

Answer All the Questions (30 Marks)

Q1. Evaluate the anatomical importance of the foramen magnum in skull fractures. Damage at this site is especially life-threatening because it transmits:

A. Cranial nerves III, IV, VI

B. Vertebral arteries and spinal cord

C. Internal carotid artery

D. Middle meningeal artery

Q2. Apply clinical reasoning: Difficulty in jaw opening and reduced facial sensation after skull trauma indicates involvement of which foramen relevant to physiotherapy assessment of mastication?

A. Foramen rotundum

B. Foramen ovale

C. Stylomastoid foramen

D. Optic canal

Q3. Evaluate the functional impact of a vagus nerve injury most relevant to physiotherapy rehabilitation planning. Which deficit is most significant?

A. Facial muscle paralysis

B. Autonomic dysfunction affecting heart rate and respiration

C. Loss of visual acuity

D. Reduced jaw strength

Q4. Evaluate why fractures near the foramen magnum demand extreme caution during early mobilization and cervical handling in physiotherapy.

A. Risk of vertebral artery spasm only

B. Proximity to lower cranial nerves controlling facial expression

C. Transmission of spinal cord and vital autonomic pathways

D. Attachment of temporalis muscle

Q5. A patient with instability at the Atlanto-axial joint is most likely to have difficulty performing which movement?

A. Flexion and extension of the neck

B. Lateral flexion of the neck

C. Rotation of the head

D. Elevation of the shoulders

Q6. Analyze the articulation between cranial bones. Which suture allows growth of the skull in infancy while maintaining strength?

A. Coronal suture

B. Lambdoid suture

C. Squamous suture

D. All cranial sutures

Q7. Create a fracture-pattern scenario: A blow to the lateral skull producing a linear fracture extending through the temporal bone is most likely to compromise hearing due to involvement of the:

A. Squamous part

B. Mastoid air cells

C. Zygomatic process

D. Styloid process

Q8. Analyze a patient with a lateral skull fracture who develops an epidural hematoma and rapid neurological deterioration. Which anatomical feature explains the urgency of this condition?

A. Venous bleeding from the superior sagittal sinus

B. Arterial bleeding from the middle meningeal artery at the pterion

C. Compression of cranial nerve VIII

D. Disruption of cerebrospinal fluid circulation

Q9. A clinician evaluates a patient with suspected vertebral artery insufficiency during neck rotation. Which cervical level should be most carefully assessed for anatomical vulnerability?

A. C1–C2

B. C3–C4

C. C5–C6

D. C7–T1

Q10. While designing a rehabilitation program for a patient with cervical spondylosis, analyze which structural characteristic of the cervical vertebrae should most influence exercise selection?

A. Orientation of zygapophyseal joints favoring flexion and extension

B. Presence of costotransverse joints

C. Vertical orientation of spinous processes

D. Fusion of vertebral bodies

Q11. A physiotherapy student differentiating a typical rib from an atypical rib identifies a head with two articular facets. Analyze which functional advantage does this feature provide?

A. It increases attachment area for intercostal muscles

B. It allows articulation with two adjacent thoracic vertebral bodies

C. It strengthens the rib against fracture

D. It limits excessive movement at the costovertebral joint

Q12. From a physiotherapy perspective, evaluate which rib region should be most carefully protected during aggressive manual therapy due to proximity to neurovascular structures?

A. Upper border of the rib

B. Shaft of the rib

C. Inferior border near the costal groove

D. Costochondral junction

Q13. A physiotherapy student learning surface anatomy is asked to identify a prominent muscle that divides the neck into anterior and posterior triangles. Which muscle performs this anatomical role?

A. Trapezius

B. Sternocleidomastoid

C. Scalenus anterior

D. Levator scapulae

Q14. A patient undergoing thoracic surgery shows signs of hoarseness post-operatively. Injury to which thoracic structure is most likely responsible?

A. Phrenic nerve

B. Vagus nerve

C. Recurrent laryngeal nerve

D. Sympathetic trunk

Q15. A mass in the anterior mediastinum is suspected in a young adult. Analyze which thoracic structure is most commonly involved in this region?

A. Descending thoracic aorta

B. Esophagus

C. Thymus

D. Thoracic duct

Q16. A physiotherapist evaluating breathing mechanics notes reduced lung expansion following cardiac surgery. Which thoracic structure's impairment most directly contributes to this limitation?

A. Pleura

B. Pericardium

C. Trachea

D. Aorta

Q17. When comparing C3–C6 vertebrae with C7, analyze which feature makes C7 clinically easier to palpate?

A. Presence of transverse foramina

B. Bifid spinous process

C. Long, non-bifid spinous process

D. Larger vertebral foramen

Q18. Analyze which branch of the common carotid artery supplies the face, scalp, and neck structures but does not enter the cranial cavity?

A. Internal carotid artery

B. External carotid artery

C. Vertebral artery

D. Subclavian artery

Q19. A physiotherapy student describing the thoracic cavity identifies organs responsible for respiration and circulation. Which structures are considered the primary contents of the thorax?

A. Heart, lungs, liver, and esophagus

B. Lungs, heart, trachea, and major vessels

C. Kidneys, lungs, heart, and thymus

D. Heart, spleen, lungs, and bronchi

Q20. A physiotherapist assessing neck pain suspects scalene tightness contributing to neurovascular compression. Evaluate which clinical condition best supports this evaluation?

A. Cervical spondylosis

B. Thoracic outlet syndrome

C. Whiplash-associated disorder

D. Cervicogenic headache

Q21. A fracture of ribs 9–11 is more likely to compromise abdominal organs rather than thoracic organs. Analyze which anatomical relationship best explains this?

A. These ribs articulate with lumbar vertebrae

B. They lack costotransverse joints

C. They overlie the liver, spleen, and kidneys

D. They are directly attached to the sternum

Q22. Based on your anatomy understanding, which anatomical feature best identifies a rib as a typical rib?

A. Absence of a neck

B. Single articular facet on the head

C. Presence of a costal groove

D. Flat and broad shape

Q23. A physiotherapy student examining a typical cervical vertebra notes a bifid spinous process and transverse foramina. Which functional significance best explains these features?

A. They allow attachment for thoracic musculature and passage of spinal arteries

B. They reduce vertebral weight while transmitting the vertebral artery and improving muscle leverage

C. They increase load-bearing capacity for body weight

D. They prevent excessive flexion and extension

Q24. A physiotherapy student reviewing arterial anatomy of the neck identifies two major vessels supplying the head and neck. Which arteries primarily fulfill this role?

A. Subclavian and vertebral arteries

B. Common carotid and subclavian arteries

C. Common carotid and vertebral arteries

D. External and internal carotid arteries

Q25. Which venous structure should be most carefully considered when assessing raised intracranial pressure due to impaired venous drainage from the brain?

A. External jugular vein

B. Internal jugular vein

C. Vertebral vein

D. Subclavian vein

Q26. When comparing true ribs with false ribs, analyze which feature most significantly influences thoracic cage stability?

A. Length of the ribs

B. Direct articulation with the sternum

C. Thickness of costal cartilage

D. Orientation of rib curvature

Q27. Which primary action best explains the functional role of the sternocleidomastoid muscle when acting bilaterally?

A. Lateral flexion of the neck

B. Extension of the cervical spine

C. Flexion of the cervical spine

D. Rotation of the head to the same side

Q28. When designing a safe cervical exercise and mobilization program, which aspect of head and neck blood supply must be prioritized to prevent neurovascular compromise?

A. Anastomoses of the facial arteries

B. Venous drainage of the scalp

C. Course of the vertebral arteries in the cervical spine

D. Branching pattern of the external carotid artery

Q29. During resisted cervical rotation to the right, weakness is observed. Which muscle is most likely impaired if rotation normally occurs to the opposite side?

A. Right splenius capitis

B. Left splenius capitis

C. Right sternocleidomastoid

D. Left sternocleidomastoid

Q30. When designing a cardiopulmonary rehabilitation program, which thoracic content should be the primary focus to improve oxygen transport and endurance?

A. Intercostal nerves

B. Pulmonary arteries and veins

C. Bronchial tree and alveoli

D. Thoracic sympathetic trunk

SECTION TWO; Short Answer Questions

Answer all the questions (20 marks)

Q31. Formulate a simple explanation of the key anatomical features that distinguish a typical cervical vertebra from thoracic and lumbar vertebrae. **(5 Marks)**

Q32. Formulate a simple explanation of why C7 is commonly used as a surface landmark during clinical examination. **(5 Marks)**

Q33. Formulate a logical explanation of the anatomical boundaries of the thoracic cavity and explain how these boundaries protect and support thoracic contents**. (5 Marks)**

34. Formulate a simple explanation of how the anatomical structure of the atlas (C1) facilitates nodding movements of the head. **(5 Marks)**

SECTION THREE; Long Answer Questions.

Attempt Any of the Two (20 marks)

Q35. Formulate a logical explanation of the posterior triangle of the neck, with emphasis on its key contents**. (10 Marks)**

Q36. Formulate a logical overview of the key muscles of the neck and their functions **(10 Marks)**

Q37. Analyze the anatomical relationships of the mediastinum and explain why mediastinal masses can produce diverse clinical symptoms. **(10 Marks)**