



UNIVERSITI KUALA LUMPUR
ROYAL COLLEGE OF MEDICINE PERAK

FINAL EXAMINATION
MARCH 2026 SEMESTER

COURSE CODE : RFB20603
COURSE NAME : ANATOMY & PHYSIOLOGY 3
PROGRAMME NAME : BACHELOR OF PHYSIOTHERAPY (HONOURS)
DATE : 3 JULY 2026
TIME : 9.00 AM – 11.00 AM
DURATION : 2 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please read **CAREFULLY** the instructions given in the question paper.
 2. This question paper has information printed on both sides of the paper.
 3. This question paper consists of **TWO (2)** sections; Section A and Section B.
 4. Answer **ALL** questions in Section A and **THREE (3)** questions in Section B; Question 1 and Question 2 are **COMPULSORY**.
 5. Please mark/write your answers on the OMR answer script and answer booklet provided.
 6. Answer all questions in English language **ONLY**.
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THERE ARE 10 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 40 marks)

I) MULTIPLE CHOICE QUESTIONS (20 marks)

INSTRUCTION: Answer ALL questions.

Please use the OMR sheet provided.

1. Find the innermost layer of meninges.
 - A. Pia.
 - B. Dura.
 - C. Dermis.
 - D. Arachnoid.
 - E. Epidermis.
2. Select the statement that describes the depolarization phase of an action potential.
 - A. Membrane remains stable.
 - B. Membrane becomes negative.
 - C. Membrane becomes less negative.
 - D. Membrane becomes positively charged inside.
 - E. Membrane becomes more negatively charged.
3. Identify the brain area responsible for reasoning and judgement.
 - A. Thalamus.
 - B. Cerebellum.
 - C. Association area.
 - D. Primary visual area.
 - E. Primary somatosensory area.
4. Select the cranial nerve responsible for eye movement.
 - A. Optic.
 - B. Vagus.
 - C. Olfactory.
 - D. Trochlear.
 - E. Glossopharyngeal.

5. Identify the major input from cerebellum.
- A. Basal ganglia.
 - B. Hypothalamus.
 - C. Thalamus only.
 - D. Limbic system.
 - E. Cerebral cortex.
6. Find the structure that is affected when the midbrain is damaged.
- A. Smell.
 - B. Digestion.
 - C. Vision reflexes.
 - D. Memory storage.
 - E. Hormone secretion.
7. Identify the main arteries that supply blood to the brain.
- A. Coronary and aortic arteries.
 - B. Jugular and brachial arteries.
 - C. Subclavian and radial arteries.
 - D. External carotid and femoral arteries.
 - E. Internal carotid and vertebral arteries.
8. Select the structure that is forming blood-brain barrier.
- A. Neurons and glial cells.
 - B. Gaps between astrocytes.
 - C. Collagen fibers in the dura mater.
 - D. Tight junctions between endothelial cells.
 - E. Myelin sheaths impulse of oligodendrocytes.
9. Find the definition of sensation.
- A. Reflex activity.
 - B. Interpretation of stimuli.
 - C. Conscious awareness of stimuli only.
 - D. Motor and sensory response to stimuli.
 - E. Conscious or subconscious awareness of changes.

10. Identify the receptor that is responsible for detecting mechanoreceptors.
- A. Light.
 - B. Touch.
 - C. Chemicals.
 - D. Temperature.
 - E. Osmotic pressure.
11. Which pathway is responsible for pain and temperature?
- A. Posterior column.
 - B. Corticospinal tract.
 - C. Spinocerebellar tract.
 - D. Spinothalamic pathway.
 - E. Trigeminothalamic pathway.
12. What happens if there is damage to the lower motor neurons?
- A. Hypertonia
 - B. Babinski sign.
 - C. Flaccid paralysis.
 - D. Spastic paralysis.
 - E. Increased reflexes.
13. Find the tract that transmits pain and temperature sensations.
- A. Gracile fasciculus.
 - B. Corticospinal tract.
 - C. Cuneate fasciculus.
 - D. Spinothalamic tract.
 - E. Posterior column tract.
14. Identify the reflex that causes contraction of a stretched muscle.
- A. Stretch reflex.
 - B. Tendon reflex.
 - C. Abdominal reflex.
 - D. Crossed-extensor reflex.
 - E. Autonomic visceral reflex.

15. Identify the nerve that supplies the deltoid muscle.
- A. Radial.
 - B. Sciatic.
 - C. Median.
 - D. Axillary.
 - E. Musculocutaneous.
16. Select the condition associated with radial nerve injury.
- A. Foot drop.
 - B. Claw hand.
 - C. Winged scapula.
 - D. Waiter's tip position.
 - E. Inability to extend the wrist.
17. Identify the limbic system structure involved in memory and learning.
- A. Thalamus.
 - B. Amygdala.
 - C. Hippocampus.
 - D. Hypothalamus.
 - E. Mammillary body.
18. Select the effect of sympathetic stimulation on the pupil.
- A. Dilation.
 - B. Blinking.
 - C. Constriction.
 - D. Accommodation.
 - E. Reduction in light reflex.
19. Find the type of stroke caused by bleeding in the brain.
- A. Embolic.
 - B. Ischemic.
 - C. Thrombotic.
 - D. Hemorrhagic.
 - E. Transient ischemic.

20. Select the cranial nerve associated with parasympathetic outflow.

- A. V
- B. X
- C. III
- D. VI
- E. VIII

II) SHORT ANSWER QUESTIONS (20 marks)

INSTRUCTION: Answer ALL questions in the answer booklet provided.

Each question carries FOUR (4) marks.

1. List **FOUR (4)** main functions of limbic system.
2. State **FOUR (4)** symptoms of vertebrobasilar circulatory disorders.
3. Give **FOUR (4)** sensations transmitted by the posterior column tracts.
4. List **FOUR (4)** functions of the hypothalamus.
5. State **FOUR (4)** arteries involved in cerebral circulation.

SECTION B: MODIFIED ESSAY QUESTIONS (Total: 60 marks)

INSTRUCTION: This section consists of **FOUR (4)** questions.

Answer THREE (3) questions in the answer booklet provided.

Question 1 and Question 2 are COMPULSORY.

Question 1

- (a) List **FOUR (4)** main types of ion channels involved in generating electrical signals in neurons. (4 marks)
- (b) State **FOUR (4)** lobes of the cerebral cortex. (4 marks)
- (c) Why is pain sensation still present when touch and vibration sensation are lost? (6 marks)
- (d) Describe the effects of damage to the pons on motor and respiratory functions. (6 marks)

Question 2

- (a) Explain **SIX (6)** expected neurological deficits in a patient with midbrain damage. (6 marks)
- (b) Describe **THREE (3)** functions of the spinal cord. (6 marks)
- (c) Differentiate **FOUR (4)** characteristics of grey and white matter in the brain. (8 marks)

Question 3

- (a) Describe **THREE (3)** components of reflex arc. (6 marks)
- (b) Explain about anterior corticospinal tract. (6 marks)
- (c) Discuss the flow of cerebrospinal fluid (CSF) production and resorbing into the venous blood. (8 marks)

Question 4

- (a) State **FOUR (4)** basic functions of nervous system. (4 marks)
- (b) Explain **TWO (2)** functions of the Circle of Willis. (4 marks)
- (c) Describe **TWO (2)** characteristics of hemorrhagic stroke. (4 marks)
- (d) Describe **FOUR (4)** functions of the parasympathetic nervous system. (8 marks)

END OF EXAMINATION PAPER