



**AMREF INTERNATIONAL UNIVERSITY  
SCHOOL OF MEDICAL SCIENCE  
DEPARTMENT OF REHABILITATION MEDICINE  
BACHELOR OF SCIENCE IN PHYSIOTHERAPY  
END OF SEPT-DECEMBER 2024 TRIMESTER EXAMINATIONS**

**UNIT CODE: PHT 211                      UNIT NAME: HUMAN PHYSIOLOGY, NERVOUS  
SYSTEM AND    SPECIAL SENSES**  
**DATE:                      Friday/ 6th/December**  
**TIME:                      TWO HOURS**  
**START:                      11.15am                      STOP : 1.15pm**

**INSTRUCTIONS (physical exams)**

**Do not write on this question paper**

(Marks and questions distribution as per program curriculum.)

1. This exam is marked out of 70 marks
2. This Examination comprises 3 Sections
3. This online shall take 2 Hours

**Section A. Answer all the questions (30 Marks)**

1. Damage to the motor cortex can result in:
  - a) Sensory deficits
  - b) Impaired coordination
  - c) Muscle weakness or paralysis
  - d) Memory loss
2. Which reflex pathway involves a single synapse between sensory and motor neurons?
  - a) Monosynaptic reflex
  - b) Polysynaptic reflex
  - c) Superficial reflex
  - d) Deep reflex
3. The stretch reflex is an example of:
  - a) Monosynaptic reflex
  - b) Polysynaptic reflex
  - c) Superficial reflex
  - d) Deep reflex
4. Muscle tone is defined as:
  - a) The ability of muscles to contract quickly
  - b) The resistance of muscles to passive stretch
  - c) The strength of muscle contractions
  - d) The coordination of muscle movements
5. Which structure is responsible for coordinating voluntary movements and maintaining balance?
  - a) Cerebellum
  - b) Brainstem
  - c) Thalamus
  - d) Hypothalamus

6. The reticular formation is involved in:
- a) Regulating sleep-wake cycles
  - b) Processing visual information
  - c) Controlling voluntary movements
  - d) Regulating body temperature
7. Basal ganglia dysfunction is associated with:
- a) Parkinson's disease
  - b) Alzheimer's disease
  - c) Multiple sclerosis
  - d) Huntington's disease
8. Brodmann's areas are subdivisions of the:
- a) Cerebellum
  - b) Brainstem
  - c) Thalamus
  - d) Cerebral cortex
9. Which lobe of the cerebral cortex is primarily responsible for processing visual information?
- a) Frontal lobe
  - b) Parietal lobe
  - c) Occipital lobe
  - d) Temporal lobe
10. The function of the limbic system includes:
- a) Regulating body temperature
  - b) Processing emotions and memory
  - c) Controlling voluntary movements
  - d) Regulating sleep-wake cycles

11. REM sleep is characterized by:

- a) Slow brain waves
- b) Rapid eye movements
- c) High muscle tone
- d) Decreased dreaming

12. CSF is produced by the:

- a) Brainstem
- b) Spinal cord
- c) Choroid plexus
- d) Cerebellum

13. A condition characterized by the accumulation of CSF in the brain is called:

- a) Meningitis
- b) Hydrocephalus
- c) Encephalitis
- d) Cerebral edema

14. The blood-brain barrier helps to:

- a) Protect the brain from toxins
- b) Regulate blood pressure in the brain
- c) Facilitate the exchange of nutrients
- d) Control body temperature

15. The parasympathetic nervous system is responsible for:

- a) Increasing heart rate
- b) Dilating blood vessels
- c) Stimulating digestion
- d) Mobilizing energy reserves

16. Photopic vision refers to:

- a) Night vision
- b) Color vision
- c) Peripheral vision
- d) Central vision

17. The functional anatomy of the eyeball includes:

- a) Cornea, lens, and retina
- b) Retina, optic nerve, and sclera
- c) Iris, pupil, and vitreous humor
- d) Optic disc, fovea, and ciliary body

18. Visual acuity is measured by:

- a) The ability to detect colors
- b) The sharpness of vision
- c) The sensitivity to light
- d) The range of peripheral vision

19. Which reflex is responsible for adjusting the shape of the lens to focus on near objects?

- a) Accommodation reflex
- b) Papillary reflex
- c) Light reflex
- d) Visual reflex

20. Damage to the optic nerve would most likely result in:

- a) Blurred vision
- b) Loss of peripheral vision
- c) Double vision
- d) Color blindness

21. Scotopic vision is most effective in:
- a) Bright light conditions
  - b) Low light conditions
  - c) Color perception
  - d) Central vision
22. The function of the thalamus includes:
- a) Regulating body temperature
  - b) Processing sensory information
  - c) Controlling voluntary movements
  - d) Regulating sleep-wake cycles
23. The hypothalamus plays a key role in:
- a) Controlling hormone secretion
  - b) Processing visual information
  - c) Regulating voluntary movements
  - d) Facilitating learning and memory
24. The CSF circulates within the:
- a) Subarachnoid space
  - b) Epidural space
  - c) Ventricles of the brain
  - d) Cerebral cortex
25. Which part of a neuron transmits an electrical signal to a target cell?
- a) dendrites
  - b) soma
  - c) cell body
  - d) axon
26. Which term describes a bundle of axons in the peripheral nervous system?
- a) nucleus
  - b) ganglion
  - c) tract
  - d) nerve

27. Which functional division of the nervous system would be responsible for the physiological changes seen during exercise (e.g., increased heart rate and sweating)?

- a) somatic
- b) autonomic
- c) enteric
- d) central

28. What type of glial cell provides myelin for the axons in a tract?

- a) oligodendrocyte
- b) astrocyte
- c) Schwann cell
- d) satellite cell

29. If a thermoreceptor is sensitive to temperature sensations, what would a chemoreceptor be sensitive to?

- a) light
- b) sound
- c) molecules
- d) vibration

30. Which of these locations is where the greatest level of integration is taking place in the example of testing the temperature of the shower?

- a) skeletal muscle
- b) spinal cord
- c) thalamus
- d) cerebral cortex

**Section B. Short answer questions. Answer all the questions in this section**

31. Describe the mechanism of pain sensation and explain how the gate control theory contributes to pain modulation. (5 marks)
32. Using a diagram describe the Spinal thalamic ascending pathway (5 marks)
33. Describe five different types of receptors and give an example in each (5 marks)
34. Using a diagram describe the spinal reflex involved when one steps on a hot object (5marks)

**Section C. Long Essay Questions. Answer all the questions**

34. Describe the hearing pathway and two pathologies associated with it (10 marks)
35. Describe the formation, circulation, and functions of cerebrospinal fluid (CSF) in the central nervous system. Explain the significance of lumbar puncture in diagnosing neurological conditions. (10 marks)