

2022

M.Sc.

2nd Semester Examination

HUMAN PHYSIOLOGY

PAPER—PHY-203

Full Marks : 50

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

**UNIT-203.1 PHYSIOLOGY OF EXCITABLE CELLS
AND HIGHER FUNCTIONS OF BRAIN**

Group-A

Answer any *two* questions. 2×2

1. Define operant conditioning. Give an example. 2

(Turn Over)

2. What is striola? Mention the functions otolith organs. 1+1
3. What are meant by dendritic spine and silent synapse? 1+1
4. Briefly mention the histological organisation of gray matter. 2

Group-B

Answer any *two* questions. 2×4

5. What types of neurons are present in different regions of gray matter of spinal cord? State the location of different neurons constituting an ascending tract carrying pain impulses. 2+2
6. Describe the molecular basis of memory formation in the hippocampus. What is Savant's syndrome? 3+1
7. What is filopodia? "Growth cones guide axons in nervous system"-Explain. 1+3
8. What is Gill withdrawal reflex in *Aplysia*? Discuss the mechanism of long term sensitization in *Aplysia*? 1+3

Group-CAnswer any *one* question.

1×8

9. What are neurotrophins? Describe the molecular basis of neurotrophin signaling with reference to their receptors. What is netrin? 2+4+2
10. Describe the features and functions of nuclei present in spinal cord. Discuss the transport mechanism at the blood brain barrier. Mention the names of tight junction proteins at the blood brain barrier. 3+4+1

UNIT-203.2 INTEGRATED PHYSIOLOGY :
HOMEOSTASIS

Group-AAnswer any *two* questions.

2×2

1. What are positive and negative feedback in homeostasis? 2
2. Mention the name of the reactive oxygen and nitrogen species. 2
3. Write down the name of different isoforms of Glutathione peroxidase. 2
4. What is high altitude pulmonary edema (HAPE)? 2

Group-B

Answer any *two* questions. 2×4

5. Describe the homeostatic mechanism in the regulation of body temperature. 4
6. Discuss critically how alterations in ROS/RNS levels can modulate 'Transcriptional regulation'. 4
7. Discuss the role of ADH and aquaporin in water transport in renal tubules. 2+2
8. Write briefly about the symptoms and management of acute mountain sickness. 2+2

Group-C

Answer any *one* question. 1×8

9. What is intestinal microbiota? Discuss the crosstalk between the mucosal innate immune system and gut microbiota. What is GALT? 2+4+2
10. Discuss briefly about the physiological effects of G-forces. Mention the symptoms and prevention of forst bitu. 4+4

[*Internal Assessment - 10 Marks*]