

**Total Pages—6 PG/IIS/PHY/203.1 & 203.2/25
(2023-24)**

M. Sc. 2nd Semester Examination, 2025

HUMAN PHYSIOLOGY

PAPER — PHY-203.1 & 203.2 (2023-24)

Full Marks : 50

Time : 2 hours

Answer all questions

The figures in the right hand margin indicate marks

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

PAPER — PHY-203.1

*(Physiology of Excitable Cells and Higher
Functions of Brain)*

GROUP—A

Answer any two questions from the following :

1. What is calcitonin ?

2 × 2

2

(Turn Over)

(2)

2. What are the dendritic spines? 2
3. Why is REM sleep known as paradoxical sleep? 2
4. Write the differences between habituation and sensitization. 2

GROUP - B

Answer any two questions from the following :

5. Differentiate between skeletal and smooth muscle contraction. 4×2 4
6. Discuss the mechanism of short-term sensitization. 4
7. Name any two diseases that are related to specific ion channel mutations. Write on the two excitatory and two inhibitory neurotransmitters. 2 + 2

(3)

8. What is the region of brain responsible for the delta wave of NREM sleep ? Stimulation of which brain regions can induce sleep. 2 + 2

GROUP - C

Answer any one question from the following :

8 × 1

9. What are growth cones ? Discuss the cellular and molecular basis of long term memory formation.

3 + 5

10. Describe the process of smooth muscle contraction and relaxation. What will be the consequences of prolonged awakening or deprivation of sleep ? Which neurotransmitter is believed to be responsible for the transformation of NREM sleep to REM sleep ?

4 + 3 + 1

(4)

PAPER — PHY-203.2

(Integrated Physiology : Homeostasis)

GROUP — A

Answer any **two** questions from the following :

- 2 × 2
11. Mention the distribution of microbiota in gut. 2
12. Write down the different isoforms of superoxide dismutase. 2
13. Classify blood-related disorders. What is thrombocytopenia ? 1 + 1
14. Mention the several types of thrombocytosis. 2

GROUP — B

Answer any **two** questions from the following :

- 4 × 2
15. Describe how blood glucose homeostasis occurs in our body. 4

16. Write down the characteristics of thrombotic thrombocytopenic purpura. What do you understand by Disseminated Intravascular Coagulation (DIC)? 3 + 1
17. Describe the pathophysiology and cause of dysfibrinogenemia. What happens when antithrombin-III is deficient in blood? (1 + 2) + 1
18. Discuss critically the early development of the gut microbiome, following birth. 4

GROUP - C

Answer any one question from the following :

8 × 1

19. How is H_2O_2 catabolized by catalase and glutathione peroxidase? With a diagram, discuss critically the redox-mediated mechanisms that regulate protein functions. 3 + (3 + 2)

(6)

- 20. Describe briefly the mechanism of action of antithrombin during anticoagulation. With a suitable schematic diagram, explain the role of protein-C in balancing coagulation and anticoagulation. Classify two types of heparins and briefly mention their mode of action in anticoagulation.**
- 2 + 3 + (1 + 2)**

[Internal Assessment — 10 Marks]
