

2021

PHYSIOLOGY

PAPER-II

Time Allowed — 3 Hours

Full Marks — 200

*If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.*

*Answers may be given either in English or in Bengali but all answers must be in one and the same language.*

**Group-A**

Answer any three questions.

1. (a) Draw and describe the ultrastructure of a nerve-muscle junction.  
 (b) Describe the molecular mechanism of synaptic transmission.  
 (c) Discuss the structure and function of acetylcholine receptor found in skeletal muscle.  
 (d) Discuss the origin, course, termination and functions of the tract of Goll and Burdach. 10+10+10+10=40
2. (a) Name the hypothalamic nuclei. Discuss the role of hypothalamus in regulating food intake and thirst.  
 (b) Name the different types of GABA receptors and discuss their functions.  
 (c) Discuss the excitation-contraction coupling in skeletal muscles.  
 (d) Discuss the roles of different nerve fibres in pain perception. 10+10+10+10=40
3. (a) Describe the ionic basis of resting and excitable state of membrane potential.  
 (b) Describe briefly the histological structure and functions of cerebellum.  
 (c) Discuss the physiological basis of learning and memory.  
 (d) Discuss the functions of autonomic nervous system and its control. 10+10+10+10=40
4. (a) Draw and describe the structure of cochlea.  
 (b) Discuss the origin, course and termination of auditory pathway.  
 (c) Discuss the sensory neural pathway of olfaction.  
 (d) Discuss the visual pathway and mention the effects of lesion of the pathway at lateral geniculate body. 10+10+10+10=40
5. (a) 'Receptors are biological transducers.'— Discuss why?  
 (b) Define and explain (i) Bell-Magendie law, (ii) Weber-Flechner law.  
 (c) Compare the effects of (i) complete and (ii) incomplete transection of spinal cord.  
 (d) Discuss the nerve pathway of taste sensation. 10+10+10+10=40

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**Please Turn Over**

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6. (a) Discuss the processes for maintenance of human body temperature.  
(b) Discuss the physiological changes occur in exposure to extreme hot and cold climate.  
(c) Discuss the structure of skin with a neat diagram.  
(d) Write the composition of sweat and discuss the mechanism of sweat secretion.
- 10+10+10+10=40

### Group-B

Answer *any two* questions.

7. (a) Discuss the structure and functions of parathormone.  
(b) Discuss the synthesis, storage and release of insulin.  
(c) Name the active principles of adrenal gland and state their functions.  
(d) Compare the structure and functions of estrogen and progesterone.
- 10+10+10+10=40
8. (a) Discuss the role of hormones in pregnancy.  
(b) Discuss the actions of progesterone on uterus and ovary.  
(c) Discuss the peculiarities of foetal circulation.  
(d) Discuss the role of hormones in breast development and on lactation.
- 10+10+10+10=40
9. (a) Discuss the ground water laced arsenic control program adopted in India.  
(b) Discuss the goiter and anemia control program implemented by Govt. of India.  
(c) Discuss the strategies that may control misuse of pesticide in agriculture.  
(d) What is climate change? Discuss the effects of sound pollution on human body.
- 10+10+10+(4+6)=40
10. (a) Discuss the assessment of pulmonary volumes and capacities by a spirometer.  
(b) Write notes on (i) Vital capacity, (ii) Dead space.  
(c) Discuss the principle, procedure and applications of Harvard step test method.  
(d) Write notes on: (i) Body mass index, (ii) Anthropometric measurement.
- 10+(5+5)+10+10=40

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