

2019

**PHYSIOLOGY**

[ **Honours** ]

PAPER —II

*Full Marks : 90*

*Time : 4 hours*

*The figures in the right-hand margin indicate marks  
Candidates are required to give their answers in their  
own words as far as practicable*

*Illustrate the answers wherever necessary*

**GROUP — A**

Answer any **two** questions, taking at least  
**one** from each Subgroup:

15 × 2

**Subgroup — A(a)**

1. (a) Describe the organization of sarcotubular system of skeletal muscle.

( Turn Over )

(b) Explain with suitable diagram the gliding concept of muscle contraction.

(c) What is caldesmonin ? Mention its role in muscle contraction.  $3 + (2 + 5) + (2 + 3)$

2. (a) Define synaptic transmission. Discuss the role of  $\text{Ca}^{++}$  in synaptic transmission.

(b) What is IPSP ? State the ionic basis of development of IPSP.

(c) State the importance of Myelination.

$(2 + 5) + (2 + 3) + 3$

3. (a) Name the special junctional tissues of heart. How cardiac impulse is propagated through special junctional tissues ?

(b) Mention the location of peripheral chemoreceptors. Describe the role of baroreceptors in blood pressure regulation.

(c) Name the valves present in heart. Mention their locations and functions.

$(2 + 4) + (2 + 3) + (2 + 2)$

Subgroup – A(b)

4. (a) Diagrammatically mention the various types of movements of alimentary canal. State the importance of such movements.
- (b) Describe the mechanism of secretion of HCl in stomach.
- (c) What is entero-hepatic circulation ? Mention the significance of such circulation.  
(3 + 2) + 6 ( 2 + 2)
5. (a) What is pleura ? Mention its function in respiration.
- (b) Discuss the process of CO<sub>2</sub> transport in our body.
- (c) Mention the non-respiratory functions of lung.
- (d) Define Hereing-Breuen reflex. Write its significance.  
(2 + 2) + 5 + 3 + (1 + 2)
6. (a) What is JG apparatus ? Mention its function.

(b) Discuss the counter-current mechanism in hypertonic urine formation.

(c) What is micturation reflex ? Give a tabular representation of micturation reflex ?

(2 + 2) + 5 + (1 + 5)

GROUP – B

Answer any **five** questions, taking at least

**two** from each Subgroup :

8 × 5

Subgroup – B(a)

7. (a) Describe the mechanism of generation of action potential.

(b) Mention the definitions of GP and MEPP.

4 + (2 + 2)

8. (a) Discuss the thermal changes those take place during skeletal muscle contraction.

(b) What is triad ? Mention its function. 5 + (1 + 2)

9. (a) Calculate the stroke volume when cardiac output is 5 liters and heart rate is 72 beats-min<sup>-1</sup>.

(b) What are central and peripheral pulses ?

$$3 + \left( 2\frac{1}{2} + 2\frac{1}{2} \right)$$

10. (a) What is portal circulation ?

(b) State the peculiarities of pulmonary circulation. What is tripple response ?

$$3 + (3 + 2)$$

11. (a) What do you mean by ECG and EEG ?

(b) Name the different leads used in ECG.

$$(2 + 2) + 4$$

Subgroup – B(b)

12. (a) How GFR is calculated ?

(b) State the importance of clearance tests. 3 + 5

13. (a) Why stomach wall is insensitive to HCl in normal condition ?

(b) Differentiate between gastric and peptic ulcers.

$$4 + (2 + 2)$$

14. (a) Write the compositions of bile.

(b) What is ampula of Vater ? Why gall bladder bile is more potent than hepatic bile ?  
4 + (2 + 2)

15. (a) State the role of various factors affecting oxygen dissociation curve.

(b) Mention the factors affecting oxygen-hemoglobin dissociation curve. 5 + 3

16. (a) What is lung surfactant ? Mention its role.

(b) State the factors affecting lung compliance. 4 + 4

GROUP – C

Answer any **five** questions, taking at least **two** questions from each Subgroup: 4 × 5

Subgroup – C(a)

17. What are contractile proteins ? Mention the role of tropomyosin. 2 + 2

18. Distinguish between red and white muscles. 2 + 2

19. How end plate potential is generated ? 4

20. What is Starling's law? Mention its physiological significance. 2 + 2
21. Differentiate between single unit and multiunit smooth muscles. 2 + 2

Subgroup – C(b)

22. What do you mean by asphyxia and dyspnoea. 2 + 2
23. Differentiate between anatomical and physiological dead spaces. What is tidal breathing? 2 + 2
24. Briefly mention the function of exocrine pancreas. 4
25. What is artificial respiration? How does cyanosis develop? 2 + 2
26. Define Trueta shunt. Mention the function of Lacis cell. 2 + 2
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