2017

PHYSIOLOGY

[Honours]

PAPER – I

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 molecular architecture of plasma membrane.

(b) State the differences between active transport and facilitated diffusion.

(c) Mention the different types of cell junctions by mentioning their importance.

$$7 + 4 + 4$$

2. (a) Describe the role of platelets and Vitamin K in blood coagulation.

(b) What are the blood group antigens ? Describe the hazards of blood group incompatibility.

(c) State the significance of Arneth count.

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

3. (a) Describe the following properties of colloids :

(i) electrical double layer

(ii) salting out

(iii) isoelectric pH.

(b) What is Gibbs-Donnan effect ? Mention its role in membrane equilibrium.

(c) What is surfactant ? $(3 + 2 + 2) + (2 + 4) + 2$

(3)

Subgroup— A (b)

4. (a) Describe the stereoisomerism of monosaccharides.

   (b) State the physiological importance of derivatives of monosaccharides.

   (c) What are the blood group polysaccharides ?

   (d) State the biological functions of deoxy sugars. $6 + 4 + 3 + 2$

5. (a) Discuss in brief the secondary structure of proteins.

   (b) Describe the clover leaf structure of tRNA.

   (c) Classify lipoproteins and mention their physiological importances. $5 + 4 + (2 + 4)$

6. (a) Compare competitive and non-competitive inhibitions with special reference to their kinetics.

(b) State the factors affecting enzyme activity.

(c) What is isoenzyme ? Mention their clinical importance. $6 + 4 + 2 + 3$

GROUP – B

Answer any **five** questions, taking
at least **two** questions from each Subgroup : 8×5

Subgroup– B (a)

7. (a) Mention the different functions of mitochondria.

(b) Describe the catabolism of hemoglobin.

(c) What is hemin ? $4 + 3 + 1$

8. (a) Describe the role of different factors on erythropoiesis.

(b) What is secondary polycythemia ? $6 + 2$

9. (a) Mention the minimum criteria required for Osmosis.

(*Continued*)

(*b*) Write down the Vant-Hoff laws of osmosis.

(*c*) What is osmol ?   2 + 4 + 2

10. (*a*) What do you mean by closed and open system ?

(*b*) Briefly explain entropy on the basis of second law of thermodynamics.

(*c*) What is high energy compound ?   3 + 3 + 2

11. (*a*) What are Zona Adherens and Zomela Occludens ?

(*b*) State the functions of lysosomes.

(*c*) What is CAM ?   (2 + 2) + 3 + 1

Subgroup-- B (b)

12. (*a*) Give a comparative account of different types of DNA with their physiological importances.

(*b*) Which characteristic of fatty acid is indicated by iodine number ?   6 + 2

13. (a) Differentiate phosphoglycerides and sphingolipids.

 (b) What are eicosanoids ?

 (c) State the fate of cholesterol in our body.

$$(2 + 2) + 2 + 2$$

14. (a) Mention why linear transformation is essential to study the kinetic parameters of enzymes.

 (b) State the clinical importances of alkaline phosphatase and LDH. $4 + (2 + 2)$

15. (a) Describe the principle of spectrophotometer.

 (b) Mention the clinical applications of MRI. $4 + 4$

16. (a) Describe the principle of molecular sieve chromatography.

 (b) How radioisotopes are used in physiological studies ? $4 + 4$

(*Continued*)

GROUP – C

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

Subgroup– C (a)

17. State the buffering action of erythrocytes to maintain body pH. 4

18. Mention the functions of microtubule. 4

19. State the clinical significance of ESR, PCV and DC. $1\frac{1}{2}+1\frac{1}{2}+1$

20. Mention the use of natural and artificial anticoagulants. 4

21. What are megaloblastic and pernicious anemia ? 4

Subgroup–C (b)

22. Write a brief note on mutarotation. 4

(Turn Over)

23. Describe in brief the covalent modification of enzyme activity with an example. $2 + 2$

24. What are ribozymes and antizymes ? $2 + 2$

25. What is pKa ? Mention its importance. $2 + 2$

26. Write a brief note on artificial pacemaker. 4

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