2018

PHYSIOLOGY – HONOURS

Paper: CC-2

Full Marks: 50

*The figures in the margin indicate full marks.*

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

**Group - A**

1. Answer *any five* questions from the following: 2×5
   
   (a) Is there any difference between isotonic solution and isosmotic solution?

   (b) Does the pH of a buffer solution change with a rise in temperature? Rationalize your answer.

   (c) State any two uses of phase contrast microscope.

   (d) What do you understand by ‘tautomerism’? Give an example.

   (e) Define eicosanoids with examples.

   (f) Distinguish between the terms ‘configuration’ and ‘conformation’ of biomolecules.

   (g) What will be the surface charge of a GTP molecule?

   (h) Why is DNA more stable than RNA?

   (i) What is iodine number? Mention its use.

   (j) What is epsilon potential?

**Group - B**

2. Answer *any two* questions from the following: 5×2

   (a) Describe the Gibbs-Donnan membrane equilibrium mentioning one of its physiological relevance.

   (b) Discuss briefly the ‘salting in’ and ‘salting out’ processes of colloidal solution.

   (c) What are glycosaminoglycans and sphingolipids? Give examples.

   (d) Between oxygen and carbon dioxide which gas will diffuse at a faster rate across the alveolar-capillary epithelia and why? Distinguish between A-DNA and Z-DNA.

Please Turn Over
3. Answer any three questions from the following:

(a) How can you determine the osmotic pressure of a biological fluid using freezing point depression method? 10

(b) Animals live on negative entropy — Explain. 10

(c) (i) Why do plasma proteins exist as anions in circulating blood?

(ii) How many isomers can be produced by α-D-glucopyranose?

(iii) What do you understand by geometrical isomerism of fatty acids? 3+4+3

(d) (i) Describe with diagram the cloverleaf structure of t-RNA.

(ii) Explain the terms ‘hyperchromicity’ and ‘half Cot value’. (4+2)+(2+2)

(e) (i) What do you understand by ampholytes and amphipathic substances?

(ii) What is Beer-Lambert law? State its uses and limitations. (2+2)+(4+1+1)

(f) (i) What do you understand by the numerical aperture of a compound microscope?

(ii) Mention the uses of confocal microscope.

(iii) Describe briefly with diagram the structure of parallel and antiparallel beta sheets of protein molecules. 2+2+(2+2+2)