'समानो मन्त्रः समितिः समानी'

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 1st Semester Examination, 2021

CC2-PHYSIOLOGY

Time Allotted: 2 Hours | Full Marks: 40

The figures in the margin indicate full marks..

GROUP-A

1. Choose the correct answer (any ***five***): 1×5 = 5

(a) The chief buffering system in the blood is:
(i) Protein and H-Protein (ii) K_2HPO_4 and KH_2PO_4
(iii) $NaHCO_3$ and H_2CO_3 (iv) Haemoglobin and H-haemoglobin

(b) Van't Hoff's law is concerned with
(i) Strong electrolytes (ii) Ionic solutions
(iii) Osmotic pressure (iv) Weak electrolytes

(c) The purgative action of Epsom ($MgSO_4$) salt follows:
(i) Osmosis (ii) Adsorption (iii) Diffusion (iv) Absorption

(d) Hemolysis is caused by the dilution of RBC by
(i) Osmosis (ii) Adsorption (iii) Diffusion (iv) Absorption

(e) The process of adsorption is applied in the purification of:
(i) Enzymes (ii) Vitamins (iii) Co-enzymes (iv) Hormones

(f) Bile salts make emulsion with fat for the action of:
(i) Amylase (ii) Lipase (iii) Pepsin (iv) Trypsin

(g) The size of each colloidal particle in nm is:
(i) 4 to 40 (ii) 6 to 60 (iii) 8 to 80 (iv) 10 to 100

(h) Kinase requires:
(i) Mn^{++} (ii) Cu^{++} (iii) Mg^{++} (iv) Inorganic phosphate

(i) Alkaline phosphatase contains:
(i) Cobalt (ii) Zinc (iii) Iron (iv) Copper

GROUP-B

Answer any *three* from the following 5×3 = 15

2. Write briefly on the characteristics features of protein-protein interaction.

3. Which chromatographic techniques are used for desalting of protein solution and why?

4. Write a short note on:
Ion-dipole attraction

5. (a) What are the applications of analytical ultracentrifugation in biology? 3
(b) How sedimentation co-efficient and density of a protein are related? 2

GROUP-C

Answer any *two* from the following 10×2 = 20

6. (a) Derive the Michaelis-Menten equation of a single substrate enzyme-catalyzed reaction. 7
(b) How is enzyme action regulated by pH? 3

7. (a) What is the significance of Lineweaver-Burk double reciprocal plot? 5
(b) Give an account of competitive and non-competitive inhibition of enzymes. 5

8. (a) What are buffer systems? 3
(b) Derive the Henderson-Hasselbalch equation for buffer system and explain its significance. 7

9. (a) State the first and second laws of thermodynamics. 4
(b) Explain why these laws are relevant to biological functions. 4
(c) How can you transform Michaelis-Menten equation to the form $y = mx + c$? 2

——×——