WEST BENGAL STATE UNIVERSITY

B.Sc. Honours/Programme 2nd Semester Examination, 2021

MLBHGEC02T/MLBGCOR02T-MOLECULAR BIOLOGY (GE2/DSC2)

PROTEINS, ENZYMES AND METABOLISM

Time Allotted: 2 Hours | Full Marks: 40

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.

1. Answer any ***ten*** questions from the following: 1×10 = 10

Choose the correct alternative from the following statements

(i) The isoelectric pH of Aspartic acid is
(A) 6 (B) 9 (C) 3 (D) 7

(ii) Which one is considered as the highest energy compound?
(A) Glucose (B) Starch
(C) Phosphoenol pyruvate (D) Acyl phosphate

(iii) Which amino acid is considered as ketogenic amino acid?
(A) Tryptophan (B) Glycine (C) Leucine (D) Proline

(iv) How many ATP molecules will be required for conversion of 2-molecules of Lactic acid to Glucose?
(A) 2 (B) 4 (C) 8 (D) 6

(v) The reaction succinyl COA to succinate requires
(A) CDP (B) ADP (C) GDP (D) NADP+

(vi) Biotin is the coenzyme for
(A) Dehydrogenation reaction (B) Esterification reaction
(C) Carboxylation reaction (D) Amide bond formation reaction

(vii) Haemoglobin is an example of
(A) Tertiary structure (B) Secondary structure
(C) Primary structure (D) Quaternary structure

(viii) A sigmoidal plot of substrate concentration ([S]) verses reaction velocity (V) may indicate
(A) Michaelis-Menten kinetics (B) Co-operative binding
(C) Competitive inhibition (D) Non-competitive inhibition

(ix) The main sites for oxidative deamination are
(A) Liver and kidney (B) Skin and pancreas
(C) Intestine and mammary gland (D) Lung and spleen

(x) A compound serving a link between citric acid cycle and urea cycle is
(A) Malate (B) Citrate (C) Succinate (D) Fumarate

(xi) β-Oxidation of fatty acids requires all the following coenzymes except
(A) CoA (B) FAD (C) NAD (D) NADP

(xii) The enzyme which can add water to a carbon-carbon double bond or remove water to create a double bond without breaking the bond is
(A) Hydratase (B) Hydroxylase (C) Hydrolase (D) Esterase

(xiii) Aldolase belongs to enzyme class
(A) Lyase (B) Hydrolase (C) Transferase (D) Ligase

(xiv) PTC amino acid is the end product of
(A) Dansyl chloride method (B) Edman's degradation
(C) Dabsyl chloride method (D) Fluorescamine reaction

(xv) Galactose is phosphorylated by galactokinase to form
(A) Galactose-6-phosphate (B) Galactose-1, 6 diphosphate
(C) Galactose-1-phosphate (D) Galactose-2-phosphate

2. Answer any ***ten*** questions from the following: 2×10 = 20

(i) Name the forces responsible for tertiary structure of proteins.
(ii) What do you mean by isoelectric point of an amino acid?
(iii) What are the advantages of Lineweaver Burk plot?
(iv) What are uncouplers? Give example.
(v) What is the importance of pentose phosphate pathway?
(vi) Which step in TCA cycle require FAD? Write down the reaction.
(vii) Write down the zwitterionic structure of aspartic acid.
(viii) Write down the reaction of glycine with 1-fluro-2, 4-dinitrobenzene.
(ix) What is ketogenesis?
(x) Mention the characteristics features of peptide bond.
(xi) What is the significance of K_M? What is its unit?
(xii) What is glycogenolysis?
(xiii) Explain with example what is oxidative deamination.
(xiv) Where are the enzymes of Urea cycle located?
(xv) What are allosteric enzymes?

3. Answer any ***two*** questions from the following: 5×2 = 10

(i) Calculate the number of moles of ATP that are formed by complete oxidation following β-oxidation and TCA cycle from one mole of palmitic acid with proper mentioning the steps. 5

(ii) Describe the following biochemical conversions mentioning the names of enzyme, co-enzyme and cofactors: $2\frac{1}{2}\times2$
(a) Fructose-6-phosphate to glyceraldehyde-3-phosphate
(b) Glucose-6-phosphate to Ribulose-5-phosphate

(iii) What do you mean by oxidative phophorylation? Name two inhibitors of Electron Transport Chain. What is P/O ratio? 2+2+1

(iv) Write the use of the following reagents: $2\frac{1}{2}\times2$
(a) Phenyl isothiocyanate and (b) Hydrazine

N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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