2018

BIOTECHNOLOGY

BIT 101

BIOCHEMISTRY

Full Marks : 80

Time: 3 Hours

The figures in the margin indicates full marks for the questions

1. Find out the correct answer from the following (**any eight**) 1×8=8

A) Which amino acid is achiral-

i) Serine ii) Tyrosine

iii) Glycine iv) Asparagine

B) An acid is a ..... donor.

i) Electron ii) Proton

iii) Neutron iv) None of these

C) In a DNA strand, the nitrogenous base remain bonded with the pentose sugar by its.....carbon.

i) 1^{st} ii) 3^{rd}

iii) 4^{th} iv) 5^{th}

D) Salting out separates protein by their

i) Ion exchange ii) Polarity

iii) Solubility iv) None of these

E) The effect of a competitive inhibitor on the reaction velocity versus substrate shows-

i) K_m apparently is increased in the presence of a competitive inhibitor

ii) K_m apparently is decreased in the presence of a competitive inhibitor

iii) K_m apparently is not changed in the presence of competitive inhibitor

iv) V_{max} is the same in the presence of a competitive inhibitor.

F) ADH requires oxidized nicotinamide adenine dinucleotide (NAD^+) for catalytic activity. In the reaction catalyzed by ADH, an alcohol is oxidized to an aldehyde as NAD^+ reduced to NADH and dissociates from the enzyme. The NAD^+ is functioning as a (an):

i) Apoenzyme

ii) Coenzyme-cosubstrate

iii) Cofactor

iv) Coenzyme-prosthetic group

G) In conversion of one ATP to AMP and P_i, the standard free energy is

i) -6.3 kcal/mol

ii) +6.3 kcal/mol

iii) -7.3 kcal/mol

iv) +7.3 kcal/mol

H) Which one of the following conditions decreases the oxidations of acetyl coenzyme A by the citric acid cycle?

i) A high availability of calcium

ii) A high acetyl CoA/CoA ratio

iii) A low ATP/ADP ratio

iv) A low NAD^+/NADH ratio

I) Pyruvate carboxylase is an important enzyme in gluconeogenesis. It requires a coenzyme to covalently bound with lysine residue. The coenzyme is

i) Biotin ii) Pantothenic Acid

iii) Niacin iv) None of these

J) Hydrogen is transferred from the light reaction to the dark reaction in photosynthesis by

i) DPN ii)) NAD

iii) ATP iv) NADP

K) Calvin cycle occurs in

i) Cytoplasm ii) Chloroplast

iii) Mitochondria iv) Golgi body

2. Write short notes on- (**any three**)- 4×3=12

A) Ribozyme

B) Biosynthesis of Heme

C) Okazaki fragments

D) Prostaglandin

E) Allosterism

F) Arginine-Ornithine Cycle

3. Distinguish between- (**any four**) 4×5=20

A) Competitive Inhibition and Non competitive Inhibition

B) Functions of Enzyme and Coenzyme

C) Biosynthesis of Purine and Biosynthesis of Pyrimidine

D) Role of Insulin and Glucagon in metabolism

E) De-amination and Trans-amination

4. Answer the following questions briefly- (**any two**) 8×2=16

A) Discuss the structural differences among A-, B- and Z-DNA.

B) Describe the steps of ß-oxidation of Fatty acids

C) Discuss the structure-function relationship of a protein.

D) What are the important considerations to draw a Ramachandran Plot? Discuss.

5. Answer **any two** questions from the following- 12×2=24

A) Write briefly about the electron transport chain leading to Oxidative Phosphorylation with appropriate illustrations. 8+4=12

B) What do you mean by Photophosphorylation? Differentiate the C_3 and C4 pathways of CO_2 fixation. 2+10=12

C) Describe the pentose phosphate pathway of hexose metabolism. What are the important functions of the pathway? 10+2=12

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