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M.Sc.(Chemistry) (2015 to 2017) (Sem.–1)

BASIC BIOLOGICAL CHEMISTRY

Subject Code : MSCH-103

M.Code : 71597

Time : 3 Hrs. Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. **Attempt five questions in all including question no. 1 which is compulsory and selecting one each from unit I to IV.**

1. Answer briefly : **(2×10=20)**

(a) Define glycolysis and gluconeogenesis.

(b) Write a note on indispensable amino acids.

(c) What is Sanger method? Where is it used in biological chemistry?

(d) Give the points of difference between nucleotides and nucleosides.

(e) What is Isoelectric point? Give its significance.

(f) What is the difference between fibrous and globular proteins?

(g) Why cellulose is not digested by human digestive system?

(h) What is meant by semi-conservative replication of DNA?

(i) What do you mean by non-competitive enzymatic inhibition?

(j) Define co-enzyme, holoenzyme and co-factor.

UNIT-I

2. (a) Why should the isoelectric point of aspartic acid (3.2) be much lower than glycine (6.1)? (10)

(b) How will you synthesize proline from adipic acid and alanine from ethyl acetate? (10)

3. (a) The two strands of DNA are not identical, but are complementary. Explain. Also describe about the types of chemical interactions existing in DNA. (10)

(b) Cite the evidences for the zwitter ionic structure of amino acids. Why amino acids are called amphoteric compounds? Support your answer with examples. (10)

UNIT-II

4. (a) Enzymes are multifunctional and highly specific catalysts. Elaborate. (10)

   (b) Why lysozyme distorts one of the rings of bacterial cell wall from the chair to half chair form? (10)

5. (a) Describe Michaelis-Menton model in details. Also derive Michaelis-Menton equation. (10)

   (b) Discuss in details with chemicals equations, the role of zinc in biological systems. (10)

UNIT-III

6. (a) Write detailed notes on biotinyl coenzyme and pyridoxal phosphate. (10)

   (b) Along the events that define TCA cycle the alcohol group of (2R,3S)-isocitrate is oxidized by NAD+ to oxalosuccinate and subsequently gives α-keto glutarate. Discuss the mechanism of this enzyme catalyzed reaction. (10)

7. (a) Write a detailed note on oxidation of an amino acid to an imino acid with FAD. Discuss the mechanism of the reaction. (10)

   (b) Which coenzymes are involved during the conversion of pyruvate to ethanol? Explain the conversion with mechanism. (l0)

UNIT-IV

8. (a) Write a detailed note on carbohydrate metabolism and its regulation. (10)

   (b) Explain the open chain and cyclic structures of D-(-)-fructose. (10)

9. (a) Describe in details about alcoholic and lactic acid fermentation. (10)

   (b) Discuss all the aspects and steps of Electron transport chain in details. (10)

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.