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Register Number:

DATE:

**ST. JOSEPH’S COLLEGE (AUTONOMOUS), BENGALURU-27**

**B.Sc. CHEMISTRY – VI SEMESTER**

**SEMESTER EXAMINATION – APRIL 2018**

**CH 6215: Biochemistry**

**Time : 2.5 hrs Max Marks : 70**

*Instructions: The question paper has 2 printed pages and 3 parts. Where ever reactions are required structures must be given.*

 **Part A**

Answer ***6 out of 8*** questions . Each question carries ***2 marks***. (6×2=12)

1. Why was copper chosen as a cofactor for many metalloenzymes?
2. When is Michaelis-Menten constant equal to the substrate concentration?
3. Give the three letter code for the start and stop codons?
4. Draw the structure of 1-stearyl-2-linoleyl-3-palmityl-Sn-glycerol?
5. Name two high energy molecules other than the nucleotide triphosphates?
6. What is the glycosidic linkage in (i) trehalose (ii) cellulose?
7. Why was carbon chosen over silicon as the skeleton of biopolymers?
8. How many moles of ATP are synthesised by the oxidation of 1 mole of glucose under

(i) aerobic conditions (ii) anaerobic conditions?

**Part B**

Answer ***8 out of 10*** questions. Each question carries ***6 marks***. (8×6=48)

1. Classify polysaccharides on the basis of their composition? Draw the partial structure of (i) amylopectin (ii) heparin?
2. Define and state the significance of (i) Iodine number (ii) Saponification number?
3. Explain with suitable examples the types of interactions that arise in protein structures due to the presence of R groups of amino acids??
4. How are enzymes classified according to the Enzyme Commission, give one example for each group?
5. Draw the structure of ATP and explain why the phosphodiester bond is considered a high energy bond?
6. Give the reactions catalysed by (i) pyruvate dehydrogenase (ii) glutamate dehydrogenase (iii) succinate dehydrogenase
7. In replication what is the role of the following enzymes (i) topoisomerase I (ii) DNA ligase (iii) DNA polymerase III?
8. Diagramatically represent the ETC and mention the sites of ATP synthesis?
9. How are hormones classified give an example for each class?
10. How does an amino acid react with (i) phenylisothiocyanate (ii) 1-fluro-2,4-dinitrobenzene and (iii) Ninhydrin?

**Part C**

Answer ***2 out of 3*** questions. Each question carries ***5 marks***. (2×5=10)

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1. Of the following amino acid residues - methionine, histidine, arginine, phenylalanine, valine, glutamine, glutamic acid - which would you expect to find on the (i) surface of a protein and which you expect to find (ii) in the interior? Why?
2. How many tritium atoms are incorporated into acetate if a molecule of palmitic acid is oxidised in 100% tritiated water? Give a logical explanation for your answer.
3. Hexokinase (2.7.1.1) is the first enzyme of glycolysis, and exhibits multisubstrate binding. Mg-ATP binds with a KM = 0.6 mM in the presence of glucose, and almost not at all in the absence of glucose. What does this suggest about the structure of the protein with and without glucose?