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DATE: 29-6-19

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

**B.Sc. CHEMISTRY – VI SEMESTER**

**Special Supplementary Examination, JUNE 2019**

**CH 6215: Biochemistry**

Supplementary candidates only.

**Time : 21/2hrs 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. Give the reaction catalysed by pyruvate dehydrogenase?
2. Draw the structure of sphingosine? What is its biological function?
3. Name an enzyme that requires the following as cofactor (i) FAD (ii) Zinc ion?
4. What is P/O ratio?
5. Give a reaction for the formation of a biologically active amine from an amino acid?
6. What are the different ionic species obtained when lysine in an acidic medium is titrated against a base?
7. Name two salient features of the genetic code?
8. Define Iodine number and give its significance?

**Part B**

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

1. Draw the structure or partial structure of the following carbohydrates and give their biological role (i) trehalose (ii) heparin?
2. With the help of a well labeled diagram explain the salient features of the fluid mosic model of the cell membrane, what are its functions?
3. What is the active site of an enzyme? Enumerate with suitable examples the different models proposed to explain the binding of a substrate to the enzyme?
4. What are the different levels in the organization of protein structure? Explain taking haemoglobin as an example.
5. Draw the structure of ATP and explain why it is a high energy molecule?
6. Give the reactions catalysed by (a) glutamate-oxaloacetate transaminase (b) 3-L-hydroxyacylCoA dehydrogenase (c) Argino-succinate synthetase
7. Give a brief account of the role of different enzymes in prokaryotic DNA replication?
8. Draw the structure of a nucleotide. What is the role of nucleotides in the biological system?
9. How are hormones classified, give an example for each class?
10. With the help of graphical representations show how the rate of an enzyme catalysed reaction is affected by (i) concentration of substrate keeping enzyme concentration constant (ii) pH of the reaction keeping both enzyme and substrate concentration constant?

**Part C**

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

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| 1. Calculate the ATP yield per carbon for glucose and palmitate using theoretical values as per the overall reaction for the complete oxidation of the two molecules. Comment on your result?
2. Consider the following peptide sequence: Leu-Glu-Glu-Val-Phe-Ser-Gln-Leu-Cys-Thr-His-Val-Glu-Thr-Leu-Lys
3. For the amino acids above, identify the hydrophilic residues by circling them (O) and the hyderphobic residues by boxing them ( )
4. As the protein folds to form a tertiary structure which face of the helix is most likely facing the aqueous solvent and which most likely facing the interior of the protein.
5. What is the length of the helix?
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1. Elements and molecules were chosen either for their functionality or availability in the development of life forms. Identify which molecule or element is responsible for the following:
2. Maintaining the partial pressure of blood
3. Creating high energy molecules
4. Precursor for lipids
5. Preventing hypothermia in animals
6. Diversity of life

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