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

Register Number:

**Date: 24-04-2019**

**B. Sc. CHEMISTRY – VI SEMESTER**

**SEMESTER EXAMINATION – APRIL 2019**

**CH 6215 – Biochemistry**

**Time: 2.5 hrs Maximum Marks: 70**

**Note:** This question paper has **two** printed pages and **three parts** (twenty one questions).

**PART A**

Answer any **six** questions of the following: 6 X 2 = 12 marks

1. Which is the most abundant molecule found in dry cell, why is it the most abundant?
2. What are liposomes? Give any one of their applications.
3. Distinguish between apoenzyme and holoenzyme.
4. Give the equation for the conversion of pyruvate to ethanol, under anaerobic conditions.
5. Draw the structure of the base present in DNA and not RNA. What is it called?
6. How does an α-amino acid react with 2, 4 dinitroflurobenzene?
7. Name the enzyme that i) produces succinyl Co-A in the TCA cycle ii) helps to convert alanine to glutamate.
8. What are Okazaki fragments?

**PART B**

Answer any **eight** questions of the following: 8 X 6 = 48 marks

1. i) How do following consequences of the properties of water help living organisms?
2. High latent heat of vaporisation
3. High dielectric constant
4. Capillary action.

ii) What is rancidity? Give two ways by which it can be prevented.

1. Draw the partial structures and give the biological importance of i) cellulose ii) heparin (3 + 3)
2. With the help of neat labelled diagram explain the fluid mosaic model of animal cell membrane.
3. What is the significance of Km and Vmax? How are they affected by presence of
4. uncompetitive inhibitor and ii) competitive inhibitor ?
5. Classify enzymes according to the main classes as specified by the enzyme commission, give a suitable example for each class?
6. i) Draw the structure of ATP and explain why it has a high phosphoryl transfer potential?
7. Draw the structure of cAMP and give its biological role.
8. Explain how fatty acids are activated and transported to the mitochondria. What is the net yield of ATP on complete oxidation of palmetic acid by β-oxidation pathway?
9. Give three reactions of the urea cycle in which non-protein amino acids are synthesized.
10. With a suitable example classify proteins based on their composition.
11. How does RNA polymerase differ from DNA polymerase? What is the role of a) helicases b) primases in DNA replication?

**Part C**

Answer any **two** of the following: 5 X 2 = 10 marks

1. i) Ribonuclease molecule contains ten lysine residues which make up 10 % by weight of the ribonuclease molecule. Calculate the molecular weight of ribonuclease.

ii) Pepsin of gastic juice has a pI of about 1, much lower than that of other proteins. Which amino acids might be responsible for such low pI.

1. i) The ΔG⁰ for dephosphorylation of glucose-6-phosphate to glucose is -3.3 kJ/mol and that for hydrolysis of ATP is -7.3 kJ/mol both at 298 K and pH 7.0. Use this data to calculate ΔG⁰ and Keq for the reaction of glucose to glucose-6-phosphate catalyzed by hexokinase.

ii) Calculate ΔG⁰’ for the following reaction:

Pyruvate + NADH + H+ Lactate + NAD+

1. Pyruvate + 2 H+ + 2e- Lactate; E⁰’=-0.19V
2. NAD+ + H+ + 2e- NADH; E⁰’=-0.32V.

(Faraday constant = 9.65 X 104 Cmol-1).

1. Which hormone is referred to as
2. flight or fright hormone
3. male sex hormone
4. anti-diuretic hormone
5. female sex hormone
6. human growth hormone

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