



Date:

Registration number:

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BENGALURU-27
 B. Sc. CHEMISTRY - VI SEMESTER
 SEMESTER EXAMINATION: APRIL 2022
 (Examination conducted in July 2022)
CH 6218 - BIOCHEMISTRY

Time: 2½ hours

Max. Marks: 70

Note: This question paper has two pages and three sections

PART A

Answer any SIX of the following. Each question carries two marks

2 X 6 = 12

1. Mention any two non-covalent interactions between biomolecules.
2. Which is the most abundant molecule in the living system? Mention any two properties that make it so abundant.
3. Define saponification number. What is its significance?
4. Distinguish between an apoenzyme and a holoenzyme.
5. Draw the structures of a tripeptide Gly-Ala-Val.
6. What are the structural features that make phospholipids suitable as the major component of cell membranes?
7. Give any two methods to prevent rancidity.
8. Define anabolism and catabolism.

PART B

Answer any EIGHT of the following. Each question carries eight marks

6 X 8 = 48

9. Give Lineweaver-Burke curve for the different types of reversible inhibition of enzymes.
10. Draw the partial structure and give the biological importance of (a) chitin, (b) cellulose.
11. β -Oxidation of fatty acyl CoA in the mitochondria involves four steps which are repeated. Give these four reactions and state how many cycles stearic acid must go through before it is completely converted to acetyl CoA.
12. Write the reactions catalysed by the following enzymes.
 - i. Phosphohexose isomerase
 - ii. Ornithine transcarbamoylase
 - iii. α -Ketoglutarate dehydrogenase.

13. (a) Mention the biological functions of Nucleotides.
 (b) Explain why replication of DNA is referred to as semi conservative in nature.
 (3+3)
14. Write the structure of the given fatty acids. Identify the essential and nonessential fatty acid
 (i) 16:0 (ii) 18:2.
15. (a) Name the termination codon. What is its role in protein synthesis?
 (b) Explain why is NADH capable of generating more ATP than FADH₂.
16. (a) Explain with suitable examples absolute specificity of enzymes.
 (b) With the suitable plot explain the effect of pH on enzyme action. (3+3)
17. (a) Name the types of RNA and give their biological role.
 (b) Give its general features of genetic code. (3+3)
18. Classify proteins based on compositions and give example for each.

PART C

Answer any TWO of the following. Each question carries two marks

5 X 2 = 10

19. From the observation listed below draw a likely structure of a tetrapeptide
- Complete hydrolysis of the one mole of tetrapeptide gives two mole of glycine and one mole of each serine and phenyl alanine.
 - Partial hydrolysis gives a few dipeptides including serinylphenylalanine
 - On treatment with Sanger's reagent and subsequent hydrolysis gives glycine, phenylalanine and 2,4-dinitro phenyl serine.
20. A disaccharide on acid hydrolysis gives 2 molecules of glucose and methanol. Draw any two possible structures of the disaccharide.
21. Calculate the ΔG^0 for the following reaction. Which information it provides for a reaction.
- Fructose-6-phosphate** \rightleftharpoons **Glucose-6-phosphate** $K_{eq} = 1.97$
 - If the concentration of the fructose phosphate is adjusted to 1.5 M and of glucose-6-phosphate is 0.5 M; calculate ΔG .

-----End of questions-----