

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI-86
(For candidates admitted during the academic year 2019 – 20 and thereafter)
SUBJECT CODE: 19CH/AC/FB33
B.Sc. DEGREE EXAMINATION, NOVEMBER 2021
BRANCH IV- CHEMISTRY
THIRD SEMESTER

COURSE: ALLIED CORE

PAPER: FUNDAMENTALS OF BIOCHEMISTRY-I

CLASS: II B.Sc ADVANCED ZOOLOGY AND BIOTECHNOLOGY

TIME: 3 HOURS

MAX.MARKS: 100

SECTION – A

Answer all the questions

(15x2=30 marks)

I. Choose the correct answer

1. An example of ligase is
a) Succinate thiokinase b) Fumarase c) Aldolase d) Alanine racemase
2. The number of isomers of glucose is
a) 8 b) 4 c) 16 d) 2
3. In EM pathway 2-phosphoglycerate is converted to
a) Phosphoenolpyruvate c) Dihydroxy acetone phosphate
b) Enol pyruvate d) 1,3-bis phosphoglycerate
4. Hypokalemia occurs in _____
a) Renal failure c) Addison's disease
b) Cushing's syndrome d) Advanced dehydration
5. The number of ATP molecules at the end of the glycolysis stage of carbohydrate metabolism is
a) 6 b) 8 c) 10 d) 4

II- Fill in the blanks

6. Water molecule has a _____ geometry.
7. Isomers that differ in configuration only around the hemiacetal or carbon-1 are called _____
8. Pyruvate kinase requires _____ metal ions for maximum activity.

9. Synthesis of glucose from amino acids is termed as _____.
10. During blood coagulation, fibrinogen gets converted to _____ in the presence of thrombin.

III- Match the following

	Column A	Column B
11.	Enzyme	a. Sucrose
12.	Polysaccharide	b. Hemophilia
13.	Energy currency of cell	c. Resistance to pH change
14.	Disease related to clotting of Blood	d. Adolase
15.	Buffer solution	e. Cellulose
		f. ATP molecules
		h. Diabetes

Section B

IV. Answer any five questions

(5 x 8 =40 marks)

16. a. Explain clearly differentiating the features of induced fit model and Koshland model of enzyme action. **(6)**
- b. Give the Haworth's structure of glucose **(2)**
17. a. Fill in the empty Spaces appropriately **(6)**

Juice	pH	H ⁺ concentration	pOH
Sweet lime juice	3.10		

Dry ginger juice		3.16×10^{11}	
Pulpy orange juice			9.95

b. You have two solutions, P and Q. The pH of solution P is 3 and pH of solution Q is 11.

Which solution has more hydrogen ion concentration? Which one of it is acidic and basic? (2)

18. a. Explain the various anomalous properties of water. (4)

b. Complete the chart by placing the options given in each row in the correct column. (4)

Options	Endergonic	Exergonic
ATP coupled process /ATP produced		
Photosynthesis/ respiration		
Anabolism/ catabolism		
Spontaneous/ non- spontaneous reaction		

19. Give an account of coagulation cascade of blood. (8)

20. a. Explain the various steps involved in gluconeogenesis. (5)

b. Given below is the colour change of phenolphthalein at different pH, give the structure of phenolphthalein in the acidic and basic medium (3)



21. a. Explain in detail the various steps involved in the formation of glycogen. (5)

b. List the importance of gluconeogenesis (3)

22. Discuss in detail TCA cycle. Also account for the total number of ATP molecules/glucose molecule produced in TCA cycle. (8)

Section C

V. Answer any two questions

(2 x 15 = 30 marks)

23. a. Give a detailed account of glycolysis and its energetics. **(10)**
- b. Explain how the blood glucose level is maintained? Give the significance of HbA1c test. **(5)**
24. a. Discuss in detail the composition of blood. **(10)**
- b. Explain the acidosis and alkalosis. **(5)**
25. a. Write informative notes on oxidative phosphorylation and electron transport chain. **(9)**
- b. Explain with relevant chemical equations the formation of glucozasonone derivative from glucose. **(6)**
