

B.Sc. DEGREE EXAMINATION, NOVEMBER 2021

Branch IV - Chemistry

FIFTH SEMESTER

COURSE: MAJOR CORE

PAPER: BIOCHEMISTRY

MAX. MARKS: 100

TIME: 3 HOURS

SECTION-A

Answer all the questions:

(15 x 2 =30 Marks)

I. Choose the correct answer:

- Which of these statements are true of metabolic alkalosis?
(a) There is an increase in the carbonic acid level of plasma
(b) There is an increase in the bicarbonate level of plasma
(c) There is a decrease in the carbonic acid level of plasma
(d) There is a decrease in the bicarbonate level of plasma
- Reaction of an amino acid by Van Slyke method gives
(a) Hydroxy acid (b) keto acid (c) dimethylol amino acid (d) carboxylic acid
- Acid value is a measure of
(a) Free hydroxyl groups (b)unsaturation (c) steam volatile fatty acids (d) free carboxylic acid

II. Match the following:

- | | |
|---------------------------|---------------------------|
| 4. Carboxypeptidase | a) Tocopherols |
| 5. Competitive inhibition | b) non-steroidal hormones |
| 6. Coenzymes | c) PABA and sulpha drugs |
| 7. Role of cAMP | d) NAD |
| 8. Water soluble vitamin | e) Mg ⁺² |
| | f) Exopeptidase |
| | g) Riboflavin |
| | h) Steroidal hormones |

III. Fill in the blanks:

- The molecular logic of life are a set of relationships that involves interactions of _____.
- Ramachandran plot shows the distribution of _____ angles.
- The Strecker synthesis of an alpha amino acid involves ammonia, _____ and an aldehyde.
- Carbamoyl phosphate, aspartic acid and ATP react in the presence of specific enzymes to give _____, fumaric acid, inorganic phosphate and AMP.

IV. State whether the following statements are true or false:

- Translation happens on the ribosomes floating in the cytosol.
- Transamination reaction of glutamic acid and pyruvic acid gives α ketoglutaric acid and aspartic acid.
- Thiolitic cleavage during beta oxidation of fatty acids is catalysed by hydratase.

SECTION-B**IV. Answer any five:****(5x8=40 Marks)**

16. a) Define Buffers. Write the composition of bicarbonate buffer. (2)
b. Derive Henderson Hasselbach equation and discuss how the pH of blood is maintained by the bicarbonate buffer. (3+3)
17. How are amino acids classified based on 'R' groups? Give two examples with chemical structure for each type. (8)
18. Differentiate the structure and functions of m RNA, t RNA and r RNA with suitable diagrams. (8)
19. Discuss the metabolic pathway for the biosynthesis of palmitic acid from acetyl CoA. (8)
20. a) Discuss about albinism. (4)
b) Derive the Michaelis Menten equation and give its significance in enzyme catalysis. (3+1)
21. a) What is enzyme commission number? (2)
b) Discuss the classification of enzymes with suitable examples. (6)
22. Discuss the sources and functions of
a) Thyroxine (4)
b) Insulin (4)

SECTION-C**V. Answer any two:****(2x15=30 Marks)**

23. a) Discuss the mechanism of coagulation of blood with a neat schematic diagram. (7)
b) How are proteins sequenced by any two methods of N- terminal determinations? (4+4)
24. a) How can genetic engineering be used for the wellbeing of mankind? (5)
b) Discuss using relevant biochemical equations the mechanism by which a glucose is oxidised aerobically to pyruvate. Calculate the net gain of ATP molecules generated by this process. (8+2)
25. a) Justify why various factors affect enzyme activity by using relevant plots wherever necessary. (10)
b) Discuss the source, structure and functions of vitamin A. (5)

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