Part III — BIO-CHEMISTRY

(New Syllabus)

(English Version)

Time Allowed : 3 Hours]   [Maximum Marks : 150

Note : i) Answer *all* the questions from **Part - I.**

ii) Answer any *fifteen* questions from **Part- II.**

iii) Answer Question No. **71** in **Section - A** and any *five* questions in **Section - B** from **Part - III.**

iv) Answer any *four* questions from **Part - IV.**

v) Draw diagrams and write equations wherever necessary.

PART - I

Note : Answer *all* the questions.   50 × 1 = 50

A. Choose and write the correct answer :

1. Proteins are needed for

   a) facilitated diffusion   b) passive transport

   c) both (a) and (b)   d) none of these.

2. The pH of blood is

   a) pH 7·4   b) pH 6·1

   c) pH 1·3   d) pH 4·7.

[Turn over

3. *D*-amino acids are absorbed by

    a) active transport   b) passive diffusion

    c) both (a) and (b)   d) none of these.

4. Which one is not a pancreatic enzyme ?

    a) trypsin   b) chymotrypsin

    c) pepsin   d) elastases.

5. Which one of the following enzymes is involved in substrate level phosphorylation ?

    a) Citrate synthase   b) Isocitrate dehydrogenase

    c) Succinyl CoA synthetase   d) fumarase.

6. Blood sugar is

    a) sucrose   b) lactose

    c) glucose   d) fructose.

7. Which one of the following is codon for methionine ?

    a) GUC   b) AUG

    c) CGA   d) CGU.

8. The enzyme carbamoyl phosphate synthetase is present in

    a) mitochondria   b) cytosol

    c) nucleus   d) cell membrane.

9. .... is not an essential fatty acid.

    a) Linoleic acid   b) Linolenic acid

    c) Arachidonic acid   d) Oleic acid.

10. .... is a derivative of cholesterol.

    a) Vitamin *A*   b) Vitamin *C*

    c) Vitamin *D*   d) Vitamin *E*.

11. Which one among the following is not a modified base ?

    a) Pseudouridine   b) Isopentyl adenine

    c) Methyl guanosine   d) Deoxythymine.

12. The metabolite that accumulates in Tay Sach's disease is

    a) Galactose   b) Tyrosine

    c) Ganglioside   d) Glucose.

13. Hypopigmentation in skin and sclera is observed in

   a) Albinism   b) Alkaptonuria

   c) Hemophilia   d) Galactosemia.

14. Which of the following is a high energy compound ?

   a) Glyceraldehyde   b) AMP

   c) Pyrophosphate   d) Lactate.

15. Respiratory control of electron transport chain depends on

   a) ATP synthetase   b) ADP

   c) Ionophores   d) Creatine.

16. ES complex formation is

   a) a reversible reaction   b) an irreversible reaction

   c) an energy consuming reaction d) a complete reaction.

17. An exact structural similarity with the substrate is needed for a

   a) competitive inhibitor   b) uncompetitive inhibitor

   c) non-competitive inhibitor   d) irreversible inhibitor.

18. According to Michaelis-Menton theory

   a) only a single substrate is involved

   b) the concentration of substrate is much greater than that of enzyme

   c) an intermediate enzyme substrate complex is formed

   d) all of these.

19. What is the function of B and T memory cells ?

   a) Phagocytosis

   b) Primary immune response

   c) Secondary immune response

   d) Inhibition of antibody production.

20. Type of heavy polypeptide chain present in the IgM molecule is

   a) δ b) κ

   c) μ d) α.

B. Fill in the blanks :

21. Two solutions with identical osmotic pressures are called ....

22. .... or cyanide decreases the absorption of amino acids.

23. Glucokinase acts on glucose to form ....

24. Adenine will pair with .... in RNA.

25. In alkaptonuria, deficiency of .... is observed.

26. In the muscle cells energy is stored in the form of ....

27. Koshland proposed .... theory.

28. Infection acquired during hospital stay is called as ....

C. Write *True* or *False* :

29. Viscosity of blood is increased during anemia.

30. Fats are hydrolysed by acid pH in the stomach.

31. 24 molecules of ATP are formed in TCA cycle.

32. Synthesis of RNA from DNA is known as transcription.

33. Lanosterol is the first cyclic intermediate formed in cholesterol biosynthesis.

34. *t*-RNA molecules are not processed.

35. When $FADH_2$ is substrate in ETC, 3 molecules of ATP are formed.

36. An uncompetitive inhibitor has affinity towards ES complex.

37. Cells of natural immunity and acquired immunity are not interacting with each other.

38. Opsonins prevent phagocytosis.

D. Match the following :

39.	Fluid mosaic model	a)	Unstable and highly energised
40.	Bile salts	b)	Tumour
41.	Transmethylation	c)	Nicolson
42.	Anticodon	d)	Emulsification
43.	Neoplasm	e)	Active methionine
44.	ES complex	f)	*t*-RNA.

E.   Give one word answer :

45.   Give an example for peripheral protein.

46.   Name the hormone that influences the absorption of carbohydrates.

47.   Name two biogenic amines.

48.   Which steroid has the anti-fungal property ?

49.   What enzyme is involved in joining Okasaki fragments ?

50.   Name the virus that causes Burkitt's lymphoma.

PART - II

Note : Answer any *fifteen* questions. $15 \times 2 = 30$

51.   What is crenation ?

52.   Show structurally that the membrane lipids are amphipathic.

53.   How is acid-base balance regulated by respiratory mechanism ?

54.   How are fats digested ?

55.   Write a note on Gastrin.

56.   What are endopeptidases ?

57.   Why pancreatic α-amylase is said to be more powerful than salivary amylase / ptyalin ?

58.   What are glucogenic aminoacids ?

59.   What is substrate level phosphorylation ? Give an example.

60.   What is meant by transamination ?

61.   How are bile salts produced from bile acids ?

62.   Write the effects of lysolecithin.

63.   What are essential fatty acids ? Name them.

64.   What are exonucleases ?

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65. What do you mean by leading and lagging strands ?

66. What is an inborn error of metabolism ?

67. What are ionophores ?

68. Define K_m value.

69. What is MHC ? What is its role in our body ?

70. What is meant by affinity and avidity ?

PART – III

Note :   Answer Question No. **71** in **Section-A** which is compulsory and any *five* questions from **Section-B**.   6 × 5 = 30

SECTION – A

71. Give the biological applications of viscosity.

OR

Explain the haemoglobin buffer system.

SECTION – B

72. How are carbohydrates absorbed from the diet ?

73. Give an account on Cori cycle.

74. Explain the formation of catecholamines from tyrosine.

75. List the biological functions of lipids.

76. Give an account on oxidation of fatty acids.

77. What are the causes of cancer ? List the characteristic changes in cancer cells.

78. Explain the pathology of Galactosemia.

79. Write a note on inhibitors of electron transport chain.

80. Give an account on blood groups.

PART – IV

Note :   Answer any *four* of the following questions.   4 × 10 = 40

81. Give the reaction sequences of glycolysis.

82. Explain *RNA* transcription.

83. Give an account on the members of ETC.

84. Write the reactions of urea cycle with structures.

85. Explain the types of reversible enzyme inhibition.

86. Write notes on the following :

    i)   Phagocytosis

    ii)   Cell mediated immunity.