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Part III — BIO-CHEMISTRY

(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 answers :

1. The term 'cell membrane' was coined by
 - a) C. J. Nageli and Crammer
 - b) Singer and Nicolson
 - c) Robertson
 - d) Gorter and Grendel.

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2. The major buffer system of the red blood cells is
- a) Phosphate buffer
 - b) Haemoglobin buffer
 - c) Carbonate buffer
 - d) Acetate buffer.
3. Satiety value is high for
- a) carbohydrates
 - b) proteins
 - c) fats
 - d) vitamins.
4. D amino acids are absorbed by
- a) passive diffusion
 - b) active transport
 - c) both of them
 - d) none of them.
5. There are no enzymes in the stomach to digest
- a) proteins
 - b) carbohydrates
 - c) vitamins
 - d) none of these.
6. Which ions are needed for glucose transporter ?
- a) Na^+
 - b) K^+
 - c) Mg^{2+}
 - d) Ca^{2+} .
7. How many irreversible steps occur in glycolysis ?
- a) 2
 - b) 4
 - c) 3
 - d) 5.
8. The most important reducing power produced in HMP shunt pathway is
- a) NADH
 - b) NADPH
 - c) FAD
 - d) FADH_2 .

9. Urea is formed from

- a) Citrulline
- b) Argininosuccinate
- c) Arginine
- d) Ornithine.

10. Niacin is synthesised in the body from

- a) Phenyl alanine
- b) Tyrosine
- c) Lysine
- d) Tryptophan.

11. is a derivative of cholesterol.

- a) Vitamin A
- b) Vitamin C
- c) Vitamin E
- d) Vitamin D.

12. Which one is a saturated acid ?

- a) Oleic acid
- b) Cerebronic acid
- c) Nervonic acid
- d) Stearic acid.

13. Okazaki fragments are present in

- a) both the parental strands
- b) both the daughter strands
- c) leading strand
- d) lagging strand.

14. G-C rich region followed by A-T rich region is a signal for

- a) initiation
- b) elongation
- c) termination
- d) primer formation.

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15. Deficiency of glucose-6-phosphatase is seen in
- a) von Gierke's disease
 - b) Galactosemia
 - c) Albinism
 - d) Alkaptonuria.
16. The metabolite that accumulates in Tay-Sachs disease is
- a) Galactose
 - b) Tyrosine
 - c) Ganglioside
 - d) Glucose.
17. Succinate dehydrogenase in mitochondria is a marker of
- a) inner membrane
 - b) outer membrane
 - c) inter-membrane space
 - d) matrix.
18. Lock and key theory was proposed by
- a) Dixon
 - b) Fischer
 - c) Koshland
 - d) Michaelis-Menten.
19. The reciprocal form of M-M equation was considered by
- a) Lineweaver-Burk
 - b) Fischer
 - c) Koshland
 - d) Dixon.
20. Immunoglobulin which can cross the placentas is
- a) IgA
 - b) IgE
 - c) IgM
 - d) IgG.

B. Fill in the blanks :

21. Two solutions with identical osmotic pressures are called
22. Pancreatic lipase is also called as
23. Glycogen biosynthesis is known as
24. is the pigment of skin and hair.
25. Adenine will pair with in RNA.
26. The enzyme deficiency in albinism is
27. Koshland proposed theory.
28. Infection acquired during hospital stay is called as

C. Write *True* or *False* :

29. Carbohydrates are the major components of the cell membrane.
30. Epinephrine is also called as adrenaline.
31. Synthesis of RNA from DNA is known as transcription.
32. Lipids can be stored in the body in almost unlimited amounts.
33. Single strand binding proteins bind to double stranded DNA.
34. Galactosemia affects liver.
35. Benign tumours cannot spread from one part of the body to another.
36. Removal of terminal phosphate group from ATP is called monophosphate cleavage.
37. Enzyme substrate complex is a permanent stable complex.
38. Opsonins prevent phagocytosis.

D. Match the following :

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|-------------------------|--|
| 39. Hay's test | a) Acetyl CoA |
| 40. Unit membrane model | b) <i>m</i> RNA |
| 41. Chymotrypsin | c) Expressed by antigen presenting cells |
| 42. TCA | d) Surface tension |
| 43. Codon | e) Endopeptidase |
| 44. MHC II | f) Robertson. |

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E. Give one word answer :

45. Give one example for peripheral proteins.
46. Why cellulose cannot be digested by humans ?
47. What enzyme is involved in joining Okazaki fragments ?
48. List any two *GI* hormones.
49. What is the other name of ATP synthetase ?
50. In which part of mitochondria are the ETC chain proteins located ?

PART - II

Note : Answer any fifteen questions.

15 × 2 = 30

51. What is facilitated diffusion ?
52. What are integral proteins ?
53. What is a buffer ?
54. What is the action of pepsin on proteins ?
55. List any two anterior pituitary hormones.
56. Name the enzymes present in pancreatic juice.
57. Define glycogenolysis.
58. What are the two major classes of diabetes mellitus ?
59. Define polyuria.
60. Give the structure of thyroxine.
61. Define transmethylation.
62. What are essential fatty acids ? Give an example.
63. Give the importance of Vitamin D.
64. How do you classify phospholipids ?
65. State the Chargaff's rule of DNA composition.

66. Name the three models of DNA replication.
67. How does radiant energy cause cancer ?
68. Write the structure of ATP.
69. Define K_m value.
70. What are antigens ?

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. Derive Henderson-Haselbach equation.

OR

Write briefly on Donnan membrane equilibrium.

SECTION - B

72. Discuss the factors that affect carbohydrates and lipid absorption.
73. Give a short note on Cori cycle.
74. Explain HMP shunt pathway.
75. Write a short note on oxidative deamination.
76. Explain the formation of epinephrine from tyrosine.
77. Give an account on biosynthesis of lecithin.
78. Write short note on von Gierke's disease.
79. What are the characteristic features of cancer cells ?
80. Write short note on cell mediated immunity.

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PART - IV

Note : Answer any *four* of the following questions.

4 × 10 = 40

81. What are the reaction sequences of glycolysis ?
 82. What are the steps involved in process translation ?
 83. Give an account on RNA biosynthesis.
 84. List out the members of electron transport chain with their arrangement.
 85. Derive M-M equation.
 86. Describe the mechanisms involved in natural immunity.
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