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Part III — BIO-CHEMISTRY

(English Version)

Time Allowed : 3 Hours]

[Maximum Marks : 150

- Note :
- Answer *all* the questions from **Part - I**.
 - Answer any *fifteen* questions from **Part- II**.
 - Answer Question No. **71** in **Section - A** and any *five* questions in **Section - B** from **Part - III**.
 - Answer any *four* questions from **Part - IV**.
 - Draw diagrams and write equations wherever necessary.

PART - INote : Answer *all* the questions.

50 × 1 = 50

A. Choose and write the correct answers :

- The major buffer system of the red blood cells is
 - Phosphate buffer
 - Haemoglobin buffer
 - Carbonate buffer
 - Acetate buffer.

[Turn over

2. The pH of blood is
- | | |
|--------|---------|
| a) 7.4 | b) 6.1 |
| c) 1.3 | d) 4.7. |
3. Which ions are needed for glucose transporter ?
- | | |
|---------------------|-----------------------|
| a) Na^+ | b) K^+ |
| c) Mg^{2+} | d) Ca^{2+} . |
4. How many irreversible steps do occur in glycolysis ?
- | | |
|------|-------|
| a) 2 | b) 4 |
| c) 3 | d) 5. |
5. How many ATP molecules are generated during glycolysis ?
- | | |
|------|-------|
| a) 2 | b) 10 |
| c) 6 | d) 8. |
6. Insulin is secreted by
- | | |
|-------------|-------------|
| a) Liver | b) Kidney |
| c) Pancreas | d) Thyroid. |
7. Urea is formed from
- | | |
|---------------|-----------------------|
| a) Citrulline | b) Arginino succinate |
| c) Arginine | d) Ornithine. |
8. Which one of the following is codon for methionine ?
- | | |
|--------|---------|
| a) GUC | b) AUG |
| c) CGA | d) CGU. |

16. Lock and key theory was proposed by

- a) Dixon
- b) Fischer
- c) Koshland
- d) Michaelis-Menten.

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

- a) competitive inhibitor
- b) uncompetitive inhibitor
- c) non-competitive inhibitor
- d) irreversible inhibitor.

18. Immunoglobulin which can cross the placenta is

- a) IgA
- b) IgE
- c) IgM
- d) IgG.

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

- a) δ
- b) κ
- c) μ
- d) α .

20. Haptens

- a) are low molecular weight substances which cannot induce formation of antibodies
- b) are high molecular weight substances which cannot induce formation of antibodies
- c) are carrier molecule which can induce immune response
- d) can activate B cells directly.

- Fill in the blanks
21. The lubricating property of the synovial fluid is due the presence of in it.
 22. Secretin is a polypeptide with amino acids.
 23. Glucokinase acts on glucose to form
 24. Translocation is catalysed by the enzyme
 25. Metabolism comprises anabolism and
 26. In alkaptonuria deficiency of is observed.
 27. Oxidation-reduction reactions are otherwise called as
 28. Erythroblastosis foetalis is caused by antigen.

C. Write *True* or *False* :

29. Facilitated diffusion is an energy dependent process.
30. 24 molecules of ATP are formed in TCA cycle.
31. Leucine is purely ketogenic amino acid.
32. Obesity is one of the causative factors of atherosclerosis.
33. Okazaki fragments are joined by helicases.
34. Blood clotting mechanism is affected in hemophilia.
35. Removal of terminal phosphate group from ATP is called monophosphate cleavage.
36. Oncogenic virus can induce cancer.
37. Galactosemia affects liver.
38. Malonate is the competitive inhibitor of succinate dehydrogenase.

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D. Match the following :

- | | |
|--------------------------------|---------------------|
| 39. Erythrocyte fragility Test | a) de-oxyribose |
| 40. Fluid mosaic model | b) GI tract hormone |
| 41. Diabetes mellitus | c) Synthesis of RNA |
| 42. Transcription | d) Insulin |
| 43. Cholecystokinin | e) Osmosis |
| 44. DNA | f) Nicolson. |

E. Give one word answer :

45. What is the viscosity of blood ?
46. List any two GI hormones.
47. Name the base that is unique to DNA.
48. Which ions will accumulate on the side containing a non-diffusible protein ion (R) ?
49. Which virus causes the Burkit Lymphoma ?
50. Who proposed chemiosmotic theory ?

PART - II

Note : Answer any *fifteen* questions.

15 × 2 = 30

51. What is active transport ?
52. Classify carrier proteins.
53. Define surface tension.
54. What is the action of trypsin on proteins ?
55. What is satiety value ?
56. Name the enzymes present in pancreatic juice.
57. Define gluconeogenesis.
58. What is energy yield from TCA cycle ?

59. What are the two major classes of diabetes mellitus ?
60. Give the structure of thyroxine.
61. Define transamination.
62. What does deficiency of essential fatty acid lead to ?
63. Give the importance of bile salts.
64. What is atherosclerosis ?
65. State the Chargaff's rule of DNA composition.
66. Name the three models of DNA replication.
67. What is meant by inborn errors of metabolism ?
68. What is redox potential ?
69. Define K_m value.
70. What is an interferon ?

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 significance of osmosis.

OR

Write briefly on Donnan's membrane equilibrium.

SECTION - B

72. Give a short account of GI tract hormones.
73. Explain HMP shunt pathway.
74. Explain diabetes mellitus.

75. Write the reactions of urea cycle with structure.
76. Discuss the secretion of thyroxine from thyroid gland.
77. Give the biological functions of lipids.
78. Write short notes of Galactosemia.
79. What are the causes of cancer ?
80. Describe the inhibitors of electron transport chain.

PART - IV

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

4 × 10 = 40

81. What are the reaction sequences of glycolysis ?
 82. Describe the various steps involved in cholesterol biosynthesis.
 83. Give an account on RNA biosynthesis.
 84. Describe chemiosmotic theory.
 85. Derive M. M. equation.
 86. Explain immunoglobulins and their functions.
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