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Part III — MICROBIOLOGY

(English Version)

Time Allowed : 3 Hours]

[Maximum Marks : 150

- Note :
- i) Answer *all* the questions from **Part - A**.
 - ii) Answer any *fifteen* questions from **Part - B**.
 - iii) Answer only *six* questions from **Part - C** including Question No. 71 which is compulsory.
 - iv) Answer only *four* questions from **Part - D**.
 - v) Draw diagrams wherever necessary.

PART - A

- Note :
- i) Answer *all* the questions.
 - ii) Each question carries *one* mark.

I. Choose and write the correct answer in the answer-book : $20 \times 1 = 20$

1. The discovery of the microbial world of animalcules was made by

- a) Robert Koch
- b) Edward Jenner
- c) Anton van Leeuwenhoek
- d) Fleming.

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2. The credit of making a compound microscope goes to
- | | |
|-----------------|--------------|
| a) Robert Hooke | b) Zacharias |
| c) Knoll | d) Zernike. |
3. Which of the following is not a heavy metal ?
- | | |
|------------|-------------|
| a) Mercury | b) Chlorine |
| c) Silver | d) Copper. |
4. The highest percentage of gas present in the atmosphere is
- | | |
|--------------------|--------------------|
| a) CO ₂ | b) O ₂ |
| c) N ₂ | d) SO ₂ |
5. A zone of complete clearing of blood around the colonies is called
- | | |
|---------------------|--------------------|
| a) Alpha haemolysis | b) Beta haemolysis |
| c) Gama haemolysis | d) All of these. |
6. Hyaluronidase is an enzyme which acts on
- | | |
|-----------------|-----------------------------------|
| a) cell surface | b) intercellular cement substance |
| c) cytoplasm | d) nucleic acid. |
7. Which of the following major antigens is involved in Rheumatic fever episode ?
- | | |
|--------------|--------------|
| a) Flagellin | b) Myosin |
| c) Albumin | d) Globulin. |
8. Shigellae are gram negative
- | | |
|------------|------------------|
| a) cocci | b) bacilli |
| c) spirals | d) comma shaped. |
9. Which of the following is the habitat of adult *Fasciola hepatica* ?
- | | |
|----------|--------------|
| a) Lungs | b) Intestine |
| c) Liver | d) Brain. |

10. *Candida* is
- a) an yeast
 - b) yeast like fungus
 - c) mould
 - d) bacteria.
11. *Cryptococcus* is a
- a) non-capsulated yeast cell
 - b) capsulated yeast cell
 - c) mucous coated yeast cell
 - d) uncovered yeast cell.
12. Hepatitis A virus belongs to the family of
- a) Picornaviridae
 - b) Caliciviridae
 - c) Retroviridae
 - d) Hepadnaviridae.
13. By which of the following methods AIDS does not spread ?
- a) Blood transfusion
 - b) Sharing of needles
 - c) Shaking hands with infected person
 - d) Sexual contact with infected person.
14. *Brucella* species causes
- a) Typhoid fever
 - b) Undulant fever
 - c) Rat bite fever
 - d) Viral fever.
15. *Clostridium tetani* grows
- a) in the presence of oxygen
 - b) in the absence of oxygen
 - c) both in presence and absence of oxygen
 - d) in presence of carbon dioxide.

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III. Answer the following questions by writing *True* or *False* : $10 \times 1 = 10$

29. In Glycolysis one molecule of glucose is converted into two molecules of pyruvic acid.
30. The blue green algae bio-fertilizer is highly suitable for paddy.
31. The World Environment Day is celebrated every year on 5th May.
32. *Staphylococcus aureus* is a gram positive bacteria.
33. Infection of streptococcus pyogenes causes rheumatic fever.
34. Shigella causes bacillary dysentery.
35. Hepatitis is a bacterial disease.
36. Brucella causes diseases in sheep and goat.
37. *Trypanosoma brucei* causes kala-azar.
38. Nurse cells are seen in liver.

IV. Match the following :

$6 \times 1 = 6$

- | | |
|-------------------------------------|--------------------------------------|
| 39. Tuberculosis | a) Wine yeast |
| 40. <i>Saccharomyces cerevisiae</i> | b) Obligate intracellular parasite |
| 41. Salmonella | c) Tetanus |
| 42. Chlamydia | d) Liver infection |
| 43. <i>Clostridium tetani</i> | e) <i>Mycobacterium tuberculosis</i> |
| 44. Hepatitis A | f) Typhoid. |

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V. Answer the following questions in *one or two* sentences each : $6 \times 1 = 6$

45. Who coined the term 'cell' ?
46. Name two airborne diseases.
47. Why only a few micro-organisms are found in the stomach ?
48. What is cryptococcus ?
49. Name the person who did first transplantation.
50. What is codon ?

PART - B

Note : i) Answer any *fifteen* questions.

ii) Each question carries *two* marks. $15 \times 2 = 30$

51. Give two uses of fluorescent microscope.
52. What is fermentation ?
53. What is a Holo-enzyme ?
54. Define Antibiotics.
55. What is an attenuated culture ?
56. Define Bio-pesticide.
57. What is pasteurization ?
58. What will be the result of interaction between parasites and host ?
59. Explain the properties of M. Proteins.
60. Where are the Tetanus spores found ?
61. What causes Toxic Shock Syndrome (TSS) ?
62. Describe brucella organisms shortly.
63. Describe the cryptococcal clinical manifestation.

64. Write a note on Hepatitis D virus.
65. What is Lyme borreliosis ?
66. Define antigen.
67. What is an epitope ?
68. Define fluorescence.
69. What are mutagens ?
70. What is code degeneracy ?

PART - C

Note : i) Answer any six questions including Question No. 71 which is compulsory.

ii) Each question carries five marks. 6 × 5 = 30

71. What are the basic steps involved in Electron Microscopy ?

OR

Explain enzyme regulation by feedback inhibition.

72. Write the impact of eutrophication.
73. What are the raw materials required for penicillin production ?
74. What are the different clinical syndromes produced by salmonella ?
75. Describe the life cycle of *Leishmania donovani*.
76. Write about the structure of HIV with diagram.
77. Give the characteristics of IgM molecules.
78. Describe the advantages and disadvantages of live and killed vaccines.
79. Explain genetic code.

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PART - D

Note : i) Answer any four questions.

ii) Each question carries ten marks.

4 × 10 = 40

80. Elaborate on the work of Louis Pasteur.
 81. Explain the control of Micro-organism by radiation.
 82. Draw a schematic diagram of Nitrogen cycle and mention the important steps and organisms involved in it.
 83. Describe in detail the prophylaxis (control measures) of diphtheria.
 84. List the toxins and enzymes produced by *Staphylococcus aureus* and explain their actions.
 85. Describe in detail the general features, life cycle, treatment and laboratory diagnosis and control measures of human Taeniasis.
 86. Describe the development of T-cells in Thymus.
 87. Name the three ways by which genetic exchange occurs in bacteria.
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