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Part III — MICROBIOLOGY

(English Version)

Time Allowed : 3 Hours]

[Maximum Marks : 150

Note : Draw diagrams wherever necessary.

PART - A

Note : Answer all the questions.

- I. Choose and write the correct answer in your answer-book : $20 \times 1 = 20$
- Who laid down the postulates to establish the casual relationship between a specific microbe and a specific disease ?
 - Edward Jenner
 - Robert Koch
 - Joseph Lister
 - Robert Hook.
 - Fluorescent microscope is used in microbiology to observe pathogens such as
 - Mumps virus
 - Mycoplasma pneumoniae
 - Measles virus
 - Mycobacterium tuberculosis.

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3. Droplet nuclei are significant in the transmission of the diseases of
- a) Nervous system
 - b) Respiratory system
 - c) Reproductive system
 - d) Digestive system.
4. Which is the most widely used sanitizing agent in food processing area ?
- a) Hypochlorites
 - b) Bromine water
 - c) Chlorine dioxide
 - d) Ozone.
5. Which species of *Penicillium* was selected for the commercial production of penicillin ?
- a) *P. marnefferi*
 - b) *P. notatum*
 - c) *P. chrysogenum*
 - d) *P. camemberti*.
6. Streptococci are seen as
- a) clusters
 - b) chains
 - c) long rods
 - d) club shaped form.
7. Which antigen is involved in Rheumatic fever episodes ?
- a) Albumin
 - b) Globulin
 - c) Flagellin
 - d) Myosin.
8. Which bacilli have drum-stick appearance ?
- a) *C. diphtheriae*
 - b) *C. tetani*
 - c) *S. typhi*
 - d) *V. cholerae*.
9. Which is a food poisoning with characteristic neurotoxic effects ?
- a) Typhoid
 - b) Botulism
 - c) Cholera
 - d) Dysentery.

10. Which is an exclusive human chlamydia ?
- a) *Chlamydia trachomatis* b) *Chlamydia psittaci*
c) *Chlamydia pneumoniae* d) *Chlamydia pecorum*
11. Kala-azar is caused by
- a) *Listeria monocytogenes* b) *Trypanosoma brucei*
c) *Leishmania donovani* d) *Trypanosoma cruzi*
12. The head of tapeworm is otherwise called as
- a) Proglottid b) Rostellum
c) Sucker d) Scolex
13. Which is also known as 'Dane particle' ?
- a) HBV b) HCV
c) HDV d) HGV
14. To which family does HIV belong ?
- a) Caliciviridae b) Flaviviridae
c) Retroviridae d) Reoviridae
15. Lyme disease is transmitted by the bite of
- a) Sandfly b) Ticks
c) Tsetse fly d) Culex mosquitoes
16. Exogenous antigen presentation is associated with which of the following MHC molecules ?
- a) MHC I b) MHC II
c) MHC III d) All of these.

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17. Which of the following is a live vaccine ?
- a) APC
 - b) BHC
 - c) MHC
 - d) BCG.
18. How many types of immediate hypersensitivity reactions are present ?
- a) 5
 - b) 4
 - c) 3
 - d) 2.
19. Which of the following is a stop codon ?
- a) AAG
 - b) CAG
 - c) GCU
 - d) UGA.
20. Which molecule induces the virulence genes on the T1 plasmid ?
- a) Acetic acid
 - b) Acetosyringone
 - c) Acetaldehyde
 - d) Acetothymidine.

II. Fill in the blanks :

8 × 1 = 8

21. Dilute solution of carbolic acid is
22. Preservatives are used to reduce the growth and activity of
23. In diphtheria a greyish is formed over pharynx.
24. The release of is prevented by tetanus toxin.
25. *F. hepatica* inhabits
26. Brucellosis is a disease.
27. Thymus in mammals is a organ.
28. Two DNA fragments are joined together by

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

29. Alexander Fleming discovered the antibiotic Streptomycin.
30. Adenosine monophosphate is the most important high energy transfer component found in the cell.
31. Lignins are resistant to decomposition.
32. Because of acidity of the stomach, very few organisms are found there.
33. Vibrios survive in water for up to six months.
34. Mycoplasma organisms lack cell wall.
35. *Candida albicans* is a non-capsulated, oval yeast.
36. *Herpetic whitlow* is seen on the bodies of wrestlers.
37. The cortex of thymus contains relatively immature thymocytes.
38. Bacteriophage is a bacterial virus.

IV. Match the following : $6 \times 1 = 6$

- | | |
|------------------|--------------------------------------|
| 39. Salmonella | a) Icosohedral |
| 40. Shigella | b) Pleuropneumonia like organism |
| 41. Chlamydia | c) Undulant fever |
| 42. Mycoplasma | d) Acute bacterial dysentery |
| 43. Herpes virus | e) Enteric fever |
| 44. Brucellosis | f) Obligate intra-cellular parasite. |

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V. Answer the following questions in *one* or *two* sentence(s) each : $6 \times 1 = 6$

45. What is a bacteriostatic agent ?
46. In what does mycorrhiza play a vital role ?
47. Which micro-organism causes Necrotizing fasciitis ?
48. How do the mycetoma causing agents enter the body ?
49. What is autograft ?
50. What is code degeneracy ?

PART - B

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

51. What are the types of electron microscope ?
52. What are antiseptic agents ? Give examples.
53. Define Glycolysis.
54. Define Pasteurization.
55. Define Lyophilization.
56. What is beta haemolysis ? Give examples of organisms producing it.
57. What are the properties of M-like proteins ?
58. What is an antibiotic ?
59. Write about the characteristics of Salmonella.
60. Give a list of diseases produced by *Chlamydia trachomatis*.
61. What are the characteristics of the egg of *F. hepatica* ?
62. Define Cysticercosis.
63. Name the true fungi which cause mycetoma.

64. HIV does not spread through which means ?
65. List the animal reservoirs of Borrelia.
66. Define an epitope.
67. Give a list of fluorochromes used in immunology.
68. What is toxoid ? Give an example..
69. List the type of alterations that can occur in the nucleotide sequence of DNA.
70. What are the various mechanisms of DNA repair ?

PART - C

Note : Answer any six questions including Question No. 71 which is compulsory. 6 × 5 = 30

71. Write a short note on Fermentation.

OR

With neat diagram, describe the structure of thymus and label the various parts.

72. What are the uses of Biogas ?
73. Out of the various techniques of immobilisation, describe covalent bonding and entrapment.
74. Give an account of treatment and control of Cholera.
75. What are the clinical features of Botulism ?
76. Describe the life cycle of *Leishmania donovani*.
77. Differentiate Eumycetes from Actinomycetes which cause mycetoma.
78. Bring out the advantages and disadvantages of live and killed vaccines.
79. Describe conjugation in bacteria.

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PART - D**Note : Answer any four questions.****4 × 10 = 40**

80. Elaborate on the work of Louis Pasteur.
 81. Write short notes on Azolla and Cyanobacterium. Write their importance in agriculture.
 82. List the toxins and enzymes produced by *S. aureus* and explain their actions.
 83. Write about Tetanus toxin and its mechanism of action.
 84. What are the preventive measures and treatment for HIV infection ?
 85. Elucidate electron microscopy.
 86. Describe the structure and characteristics of antibody molecule.
 87. Describe the methods of animal cell culture.
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