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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 your answer-book : 20 × 1 = 20

1. Complete detail of living cell is detectable under
 - a) phase contrast microscope
 - b) electron microscope
 - c) dark-field microscope
 - d) fluorescent microscope.

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2. Which of the following is not a heavy metal ?
- a) Mercury
 - b) Chlorine
 - c) Silver
 - d) Copper.
3. Salts and sugar preserve foods because they
- a) make them acidic
 - b) produce a hypotonic environment
 - c) deplete nutrients
 - d) produce a hypertonic environment.
4. Citric acid is recovered by adding
- a) calcium and sulphuric acid
 - b) calcium and hydrochloric acid
 - c) sodium and sulphuric acid
 - d) sodium and hydrochloric acid.
5. Streptococci are seen as
- a) clusters
 - b) chains
 - c) long rods
 - d) club shaped form.
6. Shigellae cause
- a) amoebic dysentery
 - b) bacillary dysentery
 - c) diarrhoea
 - d) colitis.
7. A zone of complete clearing of blood around the bacterial colonies is called
- a) Alpha haemolysis
 - b) Beta haemolysis
 - c) Gamma haemolysis
 - d) all of these.

8. Vibrios are
- a) motile by single flagellum
 - b) motile by two flagella
 - c) motile by ten flagella
 - d) motile by more flagella.
9. Clostridium tetani is a
- a) gram positive rod
 - b) gram negative rod
 - c) gram positive cocci
 - d) gram negative cocci.
10. C. botulinum grows
- a) in the presence of oxygen
 - b) in the absence of oxygen
 - c) in the presence or in the absence of oxygen
 - d) in the presence of CO_2 .
11. L. donovani is transmitted by
- a) Ticks
 - b) Sandfly
 - c) Mosquitoes
 - d) Rat Flea.
12. A tapeworm segment is called
- a) Proglottid
 - b) Epiglottis
 - c) both
 - d) none of these.
13. Candida stains are
- a) gram positive
 - b) gram negative
 - c) gram variable
 - d) acid fast.
14. Mycetoma causing agents enter through
- a) mouth
 - b) nose
 - c) eye
 - d) minor trauma on the skin.

15. 'Nurse cells' are present in which organ ?
- a) Skin b) Intestine
c) Liver d) Thymus.
16. How many types of light chains are seen in immunoglobulins ?
- a) Two b) Three
c) Four d) Five.
17. Which of the following is a killed vaccine ?
- a) TAB vaccine
b) Pertussis vaccine
c) BCG Phenolised cholera vaccine
d) All of these.
18. Type I hypersensitivity reaction is mediated.
- a) IgE b) IgM
c) IgG d) IgA.
19. The codons were discovered by which of the following scientists ?
- a) Marshall Nirenberg b) Hargobind Khorana
c) Philip Leder d) All of them.
20. Which of the following is a stop codon ?
- a) UGA b) GCU
c) CAG d) AAG.

II. Fill in the blanks :

8 × 1 = 8

21. prepared rabies vaccine by injecting the pathogen into rabbits.
22. Dilute solutions of carbolic acid are
23. The trickling filter is employed for treatment.
24. Low acid foods are referred to as

25. Diphtheria spreads from one person to another by
26. Chlamydia divides repeatedly by
27. Brucella infection in pregnant animal leads to
28. IgA is present predominantly in

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

29. ATP contains higher energy phosphate bond.
30. Citric acid is used in the removal of toxic and corrosive gases in air.
31. Staphylococci are seen as chain.
32. Streptococci produce different kinds of haemolysis when grown on blood agar.
33. Gambian sleeping sickness is non-Chronic.
34. Shigellae are gram negative cocci.
35. Lyme disease is caused by *Borrelia burgdorferi*.
36. Brucella causes a zoonotic disease called brucellosis.
37. Exogenous antigens are processed and presented to T cells via MHC I molecule.
38. Nirenberg-Khorana solved the structure of DNA.

IV. Match the following : 6 × 1 = 6

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|-----------------------------|------------------------------|
| 39. Ames test | a) Typhoid fever |
| 40. Cold sterilization | b) Malta fever |
| 41. <i>Salmonella typhi</i> | c) Allergy |
| 42. Brucella | d) <i>Trypanema pallidum</i> |
| 43. IgE | e) Cancer |
| 44. Dark-field microscope | f) Gamma rays. |

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V. Answer the following questions in *one* sentence each :

6 × 1 = 6

45. Name two toxins produced by *Clostridium tetani*.
46. Give the names of two fungi that cause mycetoma.
47. Give two examples for alpha herpes virus.
48. What is hypersensitivity ?
49. Name the substance that can bind to specific antibody and specific receptors on lymphocytes.
50. Define a gene.

PART - B

Note : i) Answer any *fifteen* questions.

ii) Each question carries *two* marks.

15 × 2 = 30

51. Give two uses of fluorescent microscope.
52. What are the uses of different wavelengths of UV rays ?
53. Define fermentation.
54. What is an Antibiotic ?
55. What is an attenuated culture ?
56. Mention two important methods of composting.
57. Define pasteurization.
58. What is Beta haemolysis ?
59. Which is the important test to identify *S. aureus* ? Explain in two sentences.
60. Give the characteristics of *Salmonella*.
61. How does normal flora compete with pathogens ?
62. Describe the structure of *Taenia solium*.

63. Where is *Candida albicans* present in the body ? When does it cause an infection ?
64. What are the modes of transmission of HIV ?
65. Write a note on L. D. body.
66. Define antibody.
67. Give a list of fluorochromes used in immunology.
68. Define passive immunization.
69. Define Mutagen.
70. Define lysogeny.

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. Compare direct and indirect immunofluorescence tests.

OR

What are the methods for prevention of HIV ?

72. What is the contribution of Joseph Lister to microbiology ?
73. Give few objectives of food preservation.
74. What are the raw materials required for penicillin production ?
75. What are the clinical manifestations of cholera ?
76. List and explain the characteristics of enzymes of *Streptococcus pyogenes*.
77. How will you diagnose Lyme disease in the laboratory ?
78. Describe the structure of immunoglobulin with neat diagram.
79. Write down any one method out of two in transgenic rat production.

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PART - D

Note : i) Answer any *four* questions.

ii) Each question carries *ten* marks.

4 × 10 = 40

80. How will you evaluate the antimicrobial action ?
 81. Describe Glycolysis.
 82. Describe the industrial process involved in wine production. Write the different types of wine and their alcohol percentage.
 83. Describe in detail the prophylaxis of diphtheria.
 84. Describe the epidemiology, prevention and control of tetanus.
 85. Describe in detail the laboratory diagnosis of Herpes Simplex Virus. What are the methods of control ?
 86. Describe exogenous antigen presentation.
 87. Name the three ways by which genetic exchange occurs in bacteria.
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