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Part III — MICROBIOLOGY

(New Syllabus)

(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. The system of antiseptic surgery was developed by
 - a) John Tyndall
 - b) Joseph Lister
 - c) Louis Pasteur
 - d) Robert Koch.

2. Light microscope has a resolution of
 - a) 0.1 μm
 - b) 0.2 μm
 - c) 0.5 μm
 - d) 0.8 μm .

[Turn over

3. TCA cycle is also known as
- a) Krebs' cycle
 - b) Citric acid cycle
 - c) Amphibolic cycle
 - d) all of these.
4. Which of the following treatments remove phosphates and nitrates from sewage ?
- a) Primary
 - b) Secondary
 - c) Tertiary
 - d) Digester.
5. *Bacillus thuringiensis* is a
- a) bio-fertilizer
 - b) bio-pesticide
 - c) bio-surfactant
 - d) all of these.
6. Which of the following is used for the production of wine ?
- a) Acetic acid bacteria
 - b) Lactic acid bacteria
 - c) Propionic acid bacteria
 - d) Yeast.
7. Shigellae are sub-divided into
- a) two species
 - b) eight species
 - c) four species
 - d) six species.
8. Streptococci are seen as
- a) Clusters
 - b) Chains
 - c) Long rods
 - d) Club shaped form.
9. *Clostridium tetani* produces how many types of toxins ?
- a) Two types
 - b) Five types
 - c) Four types
 - d) Seven types.

10. Adhesion of streptococcus pyogenes to pharyngeal epithelial cell is mediated by which of the following ?
- a) Fimbriae
 - b) Lipoteichoic acid
 - c) Lipopolysaccharide
 - d) Flagella.
11. Staphylococci are
- a) Gram negative
 - b) Gram positive
 - c) Gram variable
 - d) all of these.
12. The adult tapeworm lives in the human
- a) small intestine
 - b) large intestine
 - c) rectum
 - d) all of these.
13. Candida stains
- 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. Hepatitis A and E are transmitted via
- a) Sexual contact
 - b) Needle stick
 - c) Faeco-oral route
 - d) Animal bite.

[Turn over

16. Lyme disease is transmitted by the bite of
- a) Sandfly
 - b) Ticks
 - c) Mosquitoes
 - d) Culex mosquitoes.
17. Thymus is located in which part of the body ?
- a) Respiratory tract
 - b) Thoracic cavity
 - c) Abdomen
 - d) Intestinal tract.
18. In the direct immunofluorescence test which of the following is labelled with fluorochromes ?
- a) Antigen
 - b) Specific Antibody to Antigen
 - c) Antibody of Immunoglobulin
 - d) All of these.
19. Which antibody appears first after a primary infection ?
- a) IgA
 - b) IgG
 - c) IgM
 - d) All of these.
20. The codons were discovered by which of the following scientists ?
- a) Marshall Nirenberg
 - b) Hargobind Khorana
 - c) Philip Leader
 - d) All of them.

II. Fill in the blanks :

8 × 1 = 8

21. On blood agar *S. aureus* produces colonies.
22. Botulinal toxin produces paralysis.
23. *F. Hepatica* inhabits
24. *Brucella* infection in pregnant animals leads to

25. The ectoderm of forms thymic cortex.
26. C. terminus of light chain contains region.
27. The genetic code consists of codons.
28. prepared rabies vaccine by injecting pathogen into rabbits.

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

29. A substance acted upon by an enzyme is called Co-factor.
30. Bangalore method is a method of producing penicillin.
31. Rhizobium, Azotobacter are bacterial biofertilizers.
32. In laboratory vibrio cholerae is grown in Blood agar.
33. The Shigella belongs to the family Enterobacteriaceae.
34. Clostridium tetani is an aerobic bacteria.
35. Trypanosomes are microscopic Flagellate Protozoan.
36. Fasciola hepatica is a virus.
37. Mycetoma is bacterial disease.
38. The immunoglobulins are made up of 2 light chains and 2 heavy chains.

IV. Match the following : 6 × 1 = 6

- | | |
|-------------------|-----------------------|
| 39. Edward Jenner | a) Anaerobic bacteria |
| 40. Penicillin | b) Cytoplasmic DNA |
| 41. Streptococcus | c) Antibiotic |
| 42. Salmonella | d) Protozoan parasite |
| 43. Plasmid | e) Rheumatic fever |
| 44. Leishnamia | f) Vaccine. |

[Turn over

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

6 × 1 = 6

45. Write the name of the Toxin produced by *Shigella Dysenterae*.
46. Define Beta-haemolysis.
47. Which molecules are split by beta lactamase ?
48. Write the types of the epithelial cells which are present in Thymus.
49. What is Elisa ?
50. How many sense codons are present in the genetic code ?

PART - B

Note : i) Answer any *fifteen* questions.

ii) Each questions carries *two* marks.

15 × 2 = 30

51. What are the types of electron microscope ?
52. Define catabolism.
53. What are antiseptic agents ? Give examples.
54. What are the uses of different wavelengths of UV-rays ?
55. What is theory of spontaneous generation ?
56. Mention two important methods of composting.
57. Define primary screening.
58. Explain the properties of M. like protein.
59. What is alpha haemolysis ? Give examples of organisms producing it.
60. Give the structure of tetanus bacilli.
61. What are the four species of genus *Shigella* ?
62. Write a note on L. D. body.

63. Define cysticercosis.
64. What are alpha herpes viruses ? Give examples.
65. What are the modes of transmission of HIV ?
66. Define an epitope.
67. What is Erythroblastosis Foetalis ?
68. Define active immunization.
69. Define Gene.
70. Define Mutation.

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. How did Pasteur's famous experiment defeat the theory of spontaneous generation ?

OR

What are the contributions of Leeuwenhoek to Microbiology ?

72. Write a note on oxidation pond.
73. Write the role of Bio-pesticide in Agriculture.
74. Write briefly about laboratory diagnosis of bacillary dysentery.
75. Give an account of treatment of tetanus.
76. Write a short note on Hepatitis C virus.
77. Write a short note on Borrelia.
78. Give the characteristics of IgG.
79. With neat diagram, describe the structure of thymus and label the various parts.

[Turn over

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 the Embden-Meyerhof pathway (Glycolysis).
82. Describe the biogas production from organic waste. Mention the organisms and steps involved in biogas production.
83. Write in detail about pathogenesis, structure, function of Cholera toxin. Also add a note on its treatment.
84. Describe the mechanisms by which bacteria enter the human body to cause disease.
85. Write about the clinical manifestation and preventive measures for HIV infection.
86. Describe the requirements for immunogenicity of an antigen.
87. Describe the production of transgenic animals.