2023/06

SET A

B.Sc. MICROBIOLOGY
FOURTH SEMESTER (REPEAT)
ENVIRONMENTAL MICROBIOLOGY
BMB-402

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs. Full Marks: 70

Objective

Time: 30 mins. Marks: 20

Choose the correct answer from the following: *1×20=20*

1. The average grams of microbes forest soil contains:
   a. 4×10^5 b. 8×10^5
   c. 8×10^4 d. 4×10^7
2. Which among the following are siderophore?
   a. Indole acetic acid b. Nitrogenase
   c. Ferrichrome d. All of the above
3. The quorum sensing signal molecule in gram negative bacteria is:
   a. Ethyl methyl ketone b. Acyl homoserine lactone
   c. Methyl guanosine d. Propyl cortisone
4. Virulence gene D1 and D2 is associated with:
   a. Phosphorylates other associated gene b. Excise a separate region of Ti Plasmid
   c. Act as a bridge d. Integration of the host genome
5. Anthrocyanin is associated with:
   a. Sweet odour of the plant b. Red color of the buds
   c. Nitrogen fixation d. All of the above
6. The association which involves the exchange of nutrients between two species is referred to as:
   a. Mutualism b. Parasitism
   c. Commensalism d. Antagonism
7. Where is ozone concentration highest?
   a. Trophosphere b. Stratosphere
   c. Biosphere d. Mesosphere
8. Hartig Net are associated with:
   a. Hyphae on outer side of the sheath b. Hyphae on inner side of the sheath penetrate within cortical cells
   c. Hyphae associated with coiling of the root tip d. Hyphae associated with formation of anaerobic conditions on the cortical cells
9. Meteore are burnt in:
   a. Trophosphere b. Thermosphere
   c. Exosphere d. Mesosphere

10. The range of mesosphere is:
    a. 0-12 kms
    b. 700- 10,000 kms
    c. 12-50 kms
    d. 50-80 kms

11. DNA varicella-zoster virus belongs to family:
    a. Herpesviridae
    b. Paramyxoviridae
    c. Poxviridae
    d. Anelloviridae

12. Which is the most productive zone in a lake?
    a. Littoral zone
    b. Limnetic zone
    c. Profundal zone
    d. Benthic zone

13. Which of the test is based on the assumption that no coliform should be present in 100 mL of drinking water?
    a. Multiple Tube Fermentation Test
    b. Presence-Absence Test
    c. Colilert Defined Substrate Test
    d. Membrane Filter Technique

14. Which among the following are acidophilic microbes?
    a. *Thiobacillus*
    b. *Lactobacillus*
    c. *Nitrozomonas*
    d. All of the above

15. Which microbe among the following is associated with production of buoyant intracellular gas vacuoles?
    a. *Pseudomonas diminuta*
    b. *Acinetobacter spp.*
    c. *Halobacterium salinarium*
    d. *Pseudomonas putida*

16. Which among the following is associated with oxidation of $FeSO_4$ to $Fe_2(SO_4)_3$?
    a. *Thiobacillus ferooxidans*
    b. *Scenedesmus obliquus*
    c. *Pseudomonas* sp.
    d. *Trichoderma* sp.

17. Which among the following are indicator fungi?
    a. *Agaricus campestris*
    b. *Penicillium notatum*
    c. *Aspergillus niger*
    d. All of the above

18. The sequence for biodegradation of organic materials in anaerobic digestion is:
    a. Methanogenesis-Hydrolysis-Acidogenesis
    b. Hydrolysis-Acidogenesis-Methanogenesis-
    c. Methanogenesis-Acidogenesis-Hydrolysis
    d. Acidogenesis-Hydrolysis-Methanogenesis

19. Hydrolases are enzyme catalyzes:
    a. Redox reaction, where electron are transfered
    b. Hydrolysis of chemical bonds in molecules
    c. Aids in transfer of a functional group
    d. Cleavage of chemical bonds without addition of water

20. Which of the following is employed to remove suspended solids in tertiary treatment?
    a. GAC
    b. Trickling filter
    c. Activated sludge
    d. Anaerobic digester

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(Descriptive)

Time : 2 hr. 30 mins. Marks : 50

[Answer question no.1 & any four (4) from the rest]

1. Discuss the significance of air microflora in human health, hospitals and industries. 10

2. Discuss elaborately any two airborne viral diseases. 10

3. Briefly define the terminology with a suitable example: 2×5=10
   a) Octopine
   b) Ammensalism
   c) Rhizosphere
   d) Commensalism
   e) Antibiosis

4. Explain the terminology droplet nuclei. Discuss briefly the tuberculosis and how is TB disease treated. 2+8=10

5. What are the molecular adaptations of microbes towards osmotic pressure and towards various temperatures? 10

6. What do you mean by Biomagnification? Explain the procedure in recovering of Copper metal. 2+8=10

7. Describe the methods to detect the presence of coliforms in water. Explain the significance of index organisms. 5+5=10

8. Explain anaerobic digester with a diagram. Describe an aerobic attached growth treatment process with a diagram. 5+5=10

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