Marine Microbiology - PBBT101

Unit 1

PART A **2 marks**

1. Explain Quorum sensing
2. Write a note on gram positive and gram negative bacteria
3. What is Swarming motility
4. Describe 16S rRNA
5. Laboratory identification of Vibrio spp
6. Explain Coagulase test
7. Selective media for Salmonella species
8. Define Satellitism
9. Explain Enrichment media
10. Describe Lyophilization
11. Explain Lowenstein – Jensen media
12. Details on Bacterial Cell wall.
13. Describe Phenol Coefficient Test
14. Explain the Difference between bacteria and archaea
15. What is Pure culture technique?
16. Explain Gram staining
17. What is a selective media? Give examples
18. What are the different types of staining techniques involved in identification of marine bacteria?
19. Write a note on: TCBS
20. What is a dilution factor?

5 marks

1. Brief note on Quorum sensing
2. Explain the importance of Beragy's Mannual in bacterial taxonomy.
3. Elaborate the special staining techniques for microscopic identification of marine bacteria?
4. Describe the characteristics of marine bacteria
5. Explain briefly the structure and functions of bacterial cell wall.
6. Write a commonly used method for isolation of pure culture of bacterium
7. Write a note on gram positive and gram negative bacteria with reference to the cell wall
8. What are the common features of bacterial and archeal cell structure.
9. Write a note on lysophilisation of marine bacteria.
10. Explain serial dilution and its importance

10 marks

1. Describe the general characters of marine Bacteria.
2. Elaborate on Bacterial growth curve.
3. Elaborate on the structure of bacterial cell wall with a note on peptidoglycan synthesis.
4. Write a note on collection and isolation of marine bacteria. Describe the nutritional types of marine bacteria
5. Explain biochemical and molecular identification of marine bacteria.
6. Brief note on Quorum sensing.

7. Explain briefly the structure and functions of bacterial cell wall.
8. Explain preservation techniques involved in marine bacteria.
9. Explain pure culture techniques in detail.
10. Elaborate on the special staining techniques for microscopic identification of marine bacteria?
11. Write short notes on:
    a. Swarming motility
    b. Simple staining
    c. KOH String test
    d. Brownian movement
    e. Quadrant streaking

Unit 2 2 marks

1. What are the main features of fungi cells?
2. Do photosynthetic fungi exist? How do fungi nourish themselves?
3. Fungi constitute a kingdom. Into which phyla is the fungi kingdom divided? In which of those phyla are mushrooms classified?
4. What are the hyphae and the mycelium of pluricellular fungi?
5. What types of reproduction occur in fungi?
6. What are fruiting bodies?
7. What is the ecological importance of fungi?
8. What are some industrial uses of fungi?
9. Write a role of fungi in medicine?
10. What are mycorrhizas? How do both fungi and plants benefit from this ecological interaction?
11. What are mycotoxins?
12. Explain sexual reproduction in fungi
13. Explain asexual reproduction in fungi
14. Write a note on sporulation.
15. Write a note on Marine yeast
16. What is mycorrhiza?
17. What is fragmentation?
18. What is PDA?
19. Write a note on mushroom coral.
20. Write a note on marine fungi

5 marks

1. Give a brief note on Media for Fungal culture
2. Write a note on the staining procedures for the identification of fungi.
3. Elaborate on the importance of mycotoxins
4. Write about general characteristics of marine fungi
5. Describe the fungal structure and its functions
6. Give a brief note on classification of marine fungi
7. Write a note on fungi in mangroves and its economical importance
8. Wite a note on marine yeasts

9. Give a brief note on the biotechnological potential of *Thraustochytrids*
10. Write a note on mycotoxins.

10marks

1. Classify fungi, with a note on the economic importance of fungi.
2. Discuss the economic importance of fungi with examples.
3. Explain the importance about fungi in agriculture and industry.
4. Explain classical and molecular identification of marine fungi
5. Elaborate on fungal distribution and importance.
6. What are marine fungi? Explain its structure and functions.
7. Elaborate on the biology of marine fungi along with their importance
8. Elaborate on the biology of marine yeast along with their importance
9. Discuss about marine mycology in detail
10. Write short notes on
    a. mycotoxins
    b. fruiting bodies
    c. mycorrhizas
    d. sporulation
    e. PDA

Unit 3

PART - A

1. Are viruses cellular organisms?
2. What is the basic structure of a virus?
3. Are there non-parasitic viruses?
4. What is the genetic material of a virus? What is the role of that material in viral reproduction?
5. What is the typical reproductive cycle of a DNA virus?
6. What are retroviruses? How do they reproduce and what is the role of the enzyme reverse transcriptase?
7. What does it mean when a virus is in an inactive state?
8. What is the crystallization of a virus? What is the importance of this process?
9. Host range of viruses
10. What is a Virion?
11. What is a capsid?
12. Explain viral Interference
13. Explain Viral disease surveillance.
14. Describe RNA Viruses
15. What are antiviral agents?
16. What is immunization?
17. What is viral replication?
18. What is endocytosis?
19. How do viruses target specific cells?
20. What are viral receptors?

5 marks

1. Morphology of enveloped viruses with examples.
2. Write a short note on general characters of viruses.
3. Explain the influence of biological and physical factors on the survival and spread of viruses.
4. How does viruses gain entry into animal Hosts?
5. Discuss the physical properties of viruses
6. Write a note on antiviral agents
7. Explain the types of viral infection
8. Write a note on viral immunity.
9. Discuss the structure of marine viruses
10. Write a short note on cultivation of marine viruses

10 marks

1. Elaborate on Viral Classification
2. Give details on the general methods for lab diagnosis of Viral diseases and prophylactic measures.
3. Give a brief note on general properties and structure of marine viruses.
4. Elaborate on the steps in viral replication
5. Describe antiviral agents and viral immunity
6. Elaborate on cultivation and enumeration of marine viruses
7. Explain virus taxonomy and phylogeny in detail
8. Describe the types of viral infection and the mode of viral entry
9. Discuss about marine virology in detail
10. Write short notes on
    a) Virology
    b) Immunity
    c) Viral entry
    d) Capsid
    e) Endocytosis

Unit 4

2 marks

1. Write a short note on Halophile
2. Write a short note on Thermophile
3. What are Barophiles ?
4. What is Acidophile
5. What is Alkaliphile
6. What are Methanogens ?
7. What is a Viking Mission?
8. What is an Ecological Niche?
9. Give a note on Cryophile
10. What is a Hydrothermal vent
11. Describe Extremophiles?
12. Explain Hyperthermophiles
13. Describe Psychrophile

14. Describe extremozymes
15. Differentiate acidophiles from aklaliphiles
16. Explain Commercial uses of extremophile
17. Write a note on saltpans
18. What is Soda lakes and deserts
19. Write a note on alkaline and acidic environment
20. What is the Role of salinity in the marine environment.

5 marks

1. Life in space-Discuss
2. Give a note on Adaptatios of halophiles to life in high salt conditions
3. Write a short note on Search for life on Mars-Discuss
4. How are Methanogens classified
5. What are the Commercial aspects of thermophiles
6. What are the Adaptive mechanisms of barophilic microorganisms
7. Give a note on Saltpans
8. Discuss Classification of extremophiles
9. Write about Adaptation of marine organisms to extreme environments
10. What are the applications of extremozymes

10 marks

1. What are Extremophiles? What are the applications of extremozymes?
2. Describe the diversity of microorganisms seen in alkaline environment. How are the organisms adapted to life in the alkaline environment?
3. Differentiate acidophiles from aklaliphiles. Describe the adaptations these organisms have to survive in acidic and alkaline environments.
4. Write an essay on extremophile. What are barophiles? How are they adapted to life under pressure?
5. What are aims and objectives of marine research?
6. What are marine extremophiles? How are they adapted to life in extreme conditions? Add a note on their biotechnological uses.
7. Discuss the role of salinity in the marine environment. How are the organisms adapted to life in the alkaline environment?
8. What are Extremophiles? Write about Classification of extremophiles.
9. Write an assay on industrial applications of extremophiles
10. Write a brief note:
    1. Soda lakes
    2. Deserts
    3. Extremozymes
    4. Saltpans
    5. Hydrothermal vent

Unit 5

1. What are Pigments? Give examples.
2. Define Enzymes?
3. Explain Probiotics?
4. What are Biopolymers?
5. What are Biofertilizers?
6. Explain Biofuels?
7. What is SCP?
8. What are the importance of alkaline proteases?
9. Write five industrially important enzymes.
10. What is biodegradation?
11. What are the types of biopolymers?
12. Write five examples of biopolymers?
13. Write a note on applications of biopolymers.
14. What is considered a pharmaceutical product?
15. What is the role of microbes in biodegradation?
16. Explain polymerization process?
17. What is organic farming?
18. What are the advantages and disadvantages of single cell protein?
19. Write a note on carotenoids.
20. Write a note on lipase

5 marks

1. Give a detailed description of SCP production. Explain the advantage and disadvantages of SCP.
2. Write a note on production of bacterial biofertilizers
3. Mechanism of biogas production by microbes.
4. Write a note on Biofertillizers ?
5. Bioactive Pigments from Marine Bacteria: Applications
6. Write a note on alkaline protease and its importance
7. Write a note on biodegradation
8. Give a overview on probiotics
9. Give a shortnote on biopolymers
10. What in biofuel explain its current scenario

10 marks

1. Describe the production and applications of products derived from marine microbes which are of use in the field of biotechnology.
2. Marine microbes as source of pigment for application as dye in textile industry-Explain
3. Discuss the biotechnological importance of marine microbes in the production of enzymes.
4. Explain the biotechnological importance of marine microbes in biodegradation
5. Discuss the biotechnological importance of marine microbes in the production of pharmaceutical products in detail
6. What are SCPs? Explain its biotechnological importance in detail
7. Discuss the role of marine microbes in various industrial applications

8. Describe biofuel production and the role of marine microbes in it
9. Discuss the different types of enzymes and its importance in detail
10. Write short notes on
    a) Cellulase
    b) Chitin and chitosan
    c) Bioethanol
    d) beta-Carotene
    e) Bioremediation