

**NORTH MAHARASHTRA UNIVERSITY,  
JALGAON**

**QUESTION BANK**

**F.Y.B.Sc. MICROBIOLOGY**

**PAPER I**

**ELEMENTARY MICROBIOLOGY**

**w.e.f. 2008-2009**

## Unit I<sup>ST</sup> Types of microorganisms

### Q.1.A Choose correct option for following (2 marks each)

1. Phycology is the study of  
a) Bacteria                      b) Protozoa      c) Algae                      d) Fungi
2. Algae utilize in biofertilizer production is  
a) Blue green algae      b) Green Algae      c) Brown algae      d) Yellow green Algae
3. Archaeobacteria used in biogas production is  
a) Methanogene              b) Thermoacidophiles                      c) Halophiles      d) All of these
4. Bacteria which tolerate high salt concentration are called as  
a) Barophile      b) Mesophiles                      c) Halophiles      d) None of these
5. The cell wall of algae is made up of  
a) Peptidoglycan              b) Chitin                      c) Lignin                      d) Pectin
6. Mycology is study of  
a) Bacteria                      b) Fungi                      c) Virus                      d) Protozoa
7. Viruses have all characteristics, except  
a) has either DNA or RNA                      b) are obligatory parasite  
c) has metabolic machinery                      d) are non cultivable on Laboratory media
8. Which of the following is not a prokaryotic  
a) Bacterium                      b) Paramecium                      c) Cyanobacteria                      d) Rickettsia
9. A book Micrographia is written by,  
a) Leeuwenhoek                      b) Robert Koch  
c) Fracastaro                      d) Aristotle
10. Bacteria are ,  
a) Prokaryotic, unicellular                      b) Eukaryotic unicellular  
c) Prokaryotic multicellular                      d) Eukaryotic multicellular
11. Which one is photosynthetic organism?  
a) Fungi                      b) algae  
c) Protozoa                      d) Viruses





7. Pure Culture
8. Exospore
9. Selective media
10. Complex media
11. Enrichment media
12. Differential media
13. Pasteurization
14. Spontaneous generation
15. Vaccine
16. Budding
17. Putrefaction
18. Fermentation.

**Q.2 Write Short Notes on Following (4 Marks each)**

1. Give general characters of Bacteria
2. Give general characters of Archaeobacteria
3. Give general characters of Algae
4. Give general characters of Fungi
5. Give general characters of Protozoa
6. Give general characters of Virus.
7. Give general characters of Actinomycetes
8. Give significance of Bacteria
9. Give significance of Archaeobacteria
10. Give significance of Algae
11. Give significance of Fungi
12. Give significance of Protozoa
13. Give significance of Virus
14. Give significance of Actinomycetes
15. What is Viruses?
16. What is Virons?
17. Compare between Bacteria & Archaeobacteria
18. Compare between Actinomycetes & Fungi
19. Write Short note on fimbriae

20. Flagella is locomotory organ for Bacteria, Explain
21. Give the difference between Archaeobacteria & Eubacteria
22. Give the general characteristics of Bacteria.
23. Give the significance of Algae.
24. Give the general characteristics of Algae.
25. Give the general characteristics of Fungi.
26. Give the general characteristics of Protozoa.
27. Give the general characteristics of Viruses
28. Give the general characteristics of Actinomycetes
29. Give the general characteristic & significance of Archaeobacteria,
30. Give the significance of fungi.
31. Give the significance of Protoz

**Q.3 Briefly explain following (6 Marks each)**

1. Write down economic important of Bacteria
2. Write down economic important of Archaeobacteria
3. Write down economic important of Algae
4. Write down economic important of Fungi
5. Write down economic important of Protozoa
6. Write down economic important of Virus
7. Write down economic important of Actinomycetes

**Q.4 Describe following (12 Marks each)**

1. Give general characters & significance of Bacteria
2. Give general characters & significance of Archaeobacteria
3. Give general characters & significance of Algae
4. Give general characters & significance of Fungi
5. Give general characters & significance of Protozoa
6. Give general characters & significance of Virus
7. Give general characters & significance of Actinomycetes

## Unit II Scope of Microbiology

### Q.1 Choose correct option for following (2 marks each)

1. Space microbiology is also referred as
  - a) Endomicrobiology
  - b) Exomicrobiology
  - c) Geomicrobiology
  - d) None of these
  
2. Robert Koch especially studied Etiology of Tuberculosis in human and identified bacterium
  - a) *Micobacterium leprae*
  - b) *Micobacterium tuberculosis*
  - c) *Bacillus tuberculosis*
  - d) *Micobacterium bovis*
  
3. Joseph Lister design the solution of \_\_\_\_ to wounds by means dressing
  - a) Phenolic
  - b) Dettol
  - c) Alcoholic
  - d) Acidic

### Q.2 Write short notes on following (4 marks each)

1. Write note on Germ theory of diseases
2. Give the significance of Germ theory of fermentation.
3. Enlist Koch's Postulates.
4. Describe the experiment of John Tendall for Tantalization.
5. Why Antony Von Leeuwenhoek called as 'Father of Microbiology'?
6. Write note on Experiment of Robert Hook and his "Micrographia"
7. Diagrammatically represent the Microscope of Antony Von Leeuwenhoek and write short notes.
8. Describe in short- Francesco Redi's 'Fly Experiment'
9. Discuss Spontaneous generation theory.
10. Describe the experiment of Louis Pasteur for Fermentation.
11. Define the terms Putrefaction and fermentation.
12. Discuss in short Pasteur's Contribution to fermentation research.
13. Write short note on physiological significance of fermentation.
14. Describe the 'Rise of Medical technology'.
15. Write short note on Paul Ehrlich's "Magic Bullet".
16. Comment on ,Rise of Wonder drug-The antibiotic.

17. Explain Newer approaches in Chemotherapy.
18. Describe-Rise of Vaccination.
19. Where did the technique of vaccination have it's beginning?
20. Define Pure Culture, Enlist the methods for of pure culture.
21. Define Chemotherapy , Enlist name of two chemotherapeutic drugs.
22. What is Antibiotic ? Enlist the name of two antibiotic.
23. What is the role of microbes in Environment?
24. What is the role of microbes in Agriculture?
25. Discuss the role of microbes in medical field of microbiology.
26. Describe the scope of microbiology in genetic engineering & biotechnology.
27. Give the scope of microbiology in agriculture.
28. Explain bioterrorism
29. Discuss the role of microbes in food & dairy industries.

**Q.3 Briefly explain following (8 marks each)**

1. Why were Antony Von Leeuwenhoek's observations Consider the critical first step in the development of microbiology.
2. What is spontaneous generation? Explain how Louis Pasteur and J.F. Tyndell disprove the method.
3. How Pasteur and Tyndell disproved the controversy over abiogenesis? Explain.
4. Discuss the development of pure culture technique with respect to Polymorphism belief.
5. Explain the contribution of S.Winogradsky, M.Beijerinck, and D.Ivanowsky.

<b>Unit III History of Microbiology</b>
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**Q.1 Choose correct option for following (2 marks each)**

1. "In the field of observation chance favors only the prepared mind" this statement was put by
  - a) Antonie van Leeuwenhoek
  - b) Louis Pasteur
  - c) Alexander Fleming
  - d) Darwin

2. The Pioneer of antiseptics in surgery was-  
 a) Needham                      b) Lister                      c) Koch                      d) Pasteur
3. Who among the following was not involved in disproving Spontaneous Generation?  
 a) Aristotle      b) Spallanzani                      c) J.F. Tyndall                      d) Jan Baptista

**Q.2 Write short notes on following (4 marks each)**

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## Unit IV Growth and Reproduction of Bacteria

### Q.1 A. Choose correct option for following (2 marks each)

1. A nutrient material prepared in laboratory for the growth of microorganism is called as \_\_\_\_\_.  
a) Culture media    b) Inoculum    c) Culture media    d) Suspension
2. The time required for cell division is called as \_\_\_\_\_.  
a) Generation time    b) Generation rate    c) Generation time    d) Reproduction
3. Generation time of *E. coli* is \_\_\_\_ minute.  
a) 20    b) 10    c) 15    d) 05
4. Bacterial cell do not immediately reproduce in new medium for little period is called as \_\_\_\_\_ phase.  
a) Stationary    b) Logarithmic    c) Lag    d) Death
5. In what phase of typical bacterial growth curve dose the cell destroy rate exceed than the cell multiplication rate \_\_\_\_  
a) Lag phase    b) Exponential phase    c) Stationary phase    d) Death phase
6. When quantity of bacteria is very small, following plating method is used \_\_\_\_  
a) Pour plate    b) Streak plate    c) Spread plate    d) filtration

7. \_\_\_\_ method used to know bacterial suspension population from the defined area of microscopic slide.
- a) Direct microscopic count                      b) Most probable number  
c) both (a) & (b)                                      d) None of these
8. The instrument used to measure turbidity is a \_\_\_\_
- a) Autoclave    b) Spectrophotometer                      c) Incubator    d) Fermenter
9. For filamentous bacteria and moulds, are usually measured by \_\_\_\_ method
- a) Turbidometric                      b) Dry weight                      c) All of these    d) None of these
10. Bacteria reproduced by \_\_\_\_
- a) Fragmentation                      b) Binary fission                      c) Budding                      d) all of these

**Q.1 B. Attempt following (2 marks each)**

1. By how many ways bacteria reproduce?
2. What is generation time?.
3. Enlist and describe diagrammatically stages of binary fission.
4. Define bacterial growth.
5. Enlist the phases of bacterial growth curve.
6. Differentiate between conidiophores and sporangiophore.
7. Define lag phase of bacterial growth curve.
8. Define logarithmic phase or Exponential phase of growth curve.
9. Define stationary phase of growth curve.
10. Define death phase of growth curve.
11. Enlist different direct methods to measure the bacterial growth.
12. What is CFU?
13. Enlist different indirect methods to measure the bacterial numbers.
14. Give the significance of growth.
15. What is the difference between growth and reproduction?
16. Draw and label properly bacterial growth curve.

## **Q.2 Write short notes on following (6 marks each)**

1. Explain and describe diagrammatically stages of binary fission in bacteria.
2. What is generation time? Enlist different phases of Growth.
3. Explain logarithmic phase or Exponential phase.
4. Explain plate count for measuring bacterial population.
5. Give in brief direct methods to measure the viable count.
6. How will you determine the bacterial number by dry weight method?
7. How will you estimate bacterial number by turbidity method?
8. Give the principle of spectrophotometer.
9. Give the disadvantages of plate count.
10. Explain membrane filtration technique
11. Explain concept of growth & Give the Mathematical expression of growth.
12. Explain in detail Reproduction of Bacteria.
13. Describe Growth Rate & Generation Time.
14. Explain in detail Growth curve of bacterial population.
15. Describe the practical application of Bacterial Growth Curve.
16. Describe reproduction of bacteria by means of budding & fragmentation.
17. Describe the method for measurement of growth.(Only one method)
18. Give the methods for growth determination by using biomass.
19. Give the methods for growth determination by cell count.
20. Describe the significance of growth measurement.

## **Q.4 Describe following (12 Marks each)**

1. Derive the mathematical equation for growth curve of bacteria.
2. Explain with diagram growth curve of bacteria.
3. Explain growth rate and generation time.
4. Briefly describe the direct methods to measurement the microbial growth.
5. Describe in brief plate count method with serial dilution.
6. Describe in brief membrane filtration technique to measure the bacterial growth.
7. Explain the method of direct microscopic count.
8. Explain in brief estimation of bacterial number by indirect method.
9. What is generation time? Give the mathematical equation to determine generation time.

## UNIT V: Morphology and fine structure of bacteria

### Q.1 A. Choose correct option for following (2 marks each)

1. Which of the following describes prokaryotic cell membranes?  
A) Selectively permeable      b) contains proteins and phospholipids  
c) Regulates passage of biomolecules      d) all of the above.
2. NAM means:  
a) N-acetyl murein      b) N-acetyl muramic acid  
c) N-acetyl muramic acid      d) None of the above.
3. One of the following is the Gram Positive bacterium.  
a) Escherichia coli      b) Salmonella typhi  
c) Bacillus subtilis      d) All of the above
4. Component responsible for bacterial endospore resistance is,  
a) Ca-dipicolinate      b) Na-dipicolinate  
c) colinic acid      d) all of the above.
5. Volutin granules are also called as,  
a) Babe's Granules      b) PHB Granules  
c) Volatile Granule      d) None of the above.
6. A "hair" like structure involved in chemotactic response of bacterium is called as-  
a) Flagella      b) Pilli      c) fimbriae      d) all of the above
7. A capsule is similar with respect to pilli -  
a) Permit attachment to surfaces      b) are made of proteins  
c) Contains dextran fibers      d) All of the above.
8. NAM means-  
a) N-acetylglucosamine      b) N-acetylglucosamine  
c) N-acetyl gluconamine      d) None of the above.

9. A periplasmic space within the cell wall is found in \_\_\_\_\_ bacteria and the space contains \_\_\_\_\_.
- a) Gram negative; Peptidoglycan      b) Gram positive : lipids  
c) Gram negative ; outer membrane      d) Gram positive : porin proteins
10. A physics student asked to a microbiology student “Whether periodic or circular motion is involved in motility of bacteria” As a microbiology student what would be your reply?
- a) May be circular motion      b) May be periodic motion  
c) Question is fundamentally wrng      d) It is difficult to answer the question.
11. One of the following is the Gram negative bacterium-
- a) *Bacillus subtilis*      b) *Escherichia coli*  
c) *Staphylococcus aureus*      d) All of the above.
12. Bacterial cells are prokaryotic. In comparison to a typical eukaryotic cell, they would have
- a) smaller size      b) smaller nucleus  
c) no plasma membrane      d) no internal membranous compartments
13. Which of the following not correctly matches component with its function?
- a) Lysosomes... Motility      b) Mitochondria... Energy production  
c) Ribosome... Protein synthesis      d) Chloroplast... Photosynthesis

## **Q.2 Write short notes on following (4 marks each)**

1. Give the function of capsule.
2. Explain flagellar arrangements.
3. Enlist various granules in bacterial cell.
4. How does a protoplast differ from a spheroplast.
5. What are the L-forms and how are they important?
6. How do prokaryotic and eukaryotic flagella differ?
7. Under what conditions are endospores formed by bacteria?
8. Explain the terms Fertility factor and tumblers.
9. What is a bacterial spore?
10. Diagrammatically represent various shapes and arrangement of bacteria.

11. Explain the morphology of bacteria.
12. Draw a neat labelled diagram of bacterial cell.
13. Describe the structure and chemical composition of flagella.
14. Describe the functions of flagella (All Parts).
15. Describe the structure, function and chemical composition of volutin granules & PHB granules.
16. Explain the structure & chemical composition of Gram +ve/ Gram-ve cell wall.
17. Explain the importance of bacterial chromosome & ribosome.
18. Describe magnetosomes & gas vesicle.
19. Explain internal structure of Endospore.
20. Describe the process of germination & sporulation of endospore.
21. Explain functions of cytoplasmic inclusion.
22. Explain the role of PHB granule.
23. Describe the structure & chemical composition of gram +ve bacterial cell wall.
24. Describe the structure & chemical composition of gram -ve bacterial cell wall.
25. Describe the functions of cell wall.
26. Explain structure & functions of cell membrane.
27. Describe structure, chemical composition & functions of capsule.
28. Describe the structure & functions of pili & fimbriae.
29. Explain functions of spore & cyst.

#### **Q.4 Describe following (12 marks each)**

1. Differentiate between the Gram positive and Gram negative cell wall.
2. Draw the structure of a typical prokaryotic cell.
3. Explain ultra structure of bacterial flagellum.
4. Give the difference between pilli and fimbriae.
5. Write short notes on-chlorosomes,cytoplasm,Mesosome,Nucleoid
6. Give the ultra structure of Ribosomes.
7. Explain in detail the stages in bacterial sporulation process.
8. What are the three basic parts of a flagellum?
9. Explain gas vacuoles and Magnetosomes.
10. Define – Glycocalyx, what are its functions?
11. Why is an endospore called a resting structure? Explain the significance of endospore to a bacterial cell?

12. Explain cell wall of Gram-negative organism?
13. Explain the general characteristics & significance of Bacteria.
14. Explain the general characteristics & significance of Algae.
15. Explain the general characteristics & significance of Fungi.
16. Describe the scope of microbiology in Agriculture.
17. Describe the scope of microbiology in Industrial field.
18. Explain discovery of microbial world.
19. Explain concept of growth & give mathematical expression of growth.
20. Explain in detail reproduction of bacteria.
21. Explain in detail growth curve of bacterial population.
22. Give the structure of endospore and discuss about germination and sporulation of endospore.

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