# Briefly explain following (8 marks each)

* + 1. Why were Antony Von Leeuwenhoek’s observations Consider the critical first step in the development of microbiology.

1. What is spontaneous generation? Explain how Louis Pasteur and J.F. Tyndell disprove the method.
2. How Pasteur and Tyndell disproved the controversy over abiogenesis? Explain.
3. Discuss the development of pure culture technique with respect to Polymorphism belief.
4. Explain the contribution of S.Winogradsky, M.Beijerinck, and D.Ivanowsky.

**Growth and Reproduction of Bacteria**

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

* + 1. A nutrient material prepared in laboratory for the growth of microorganism is called as .
       1. Culture media b) Inoculum c) Culture media d) Suspension
    2. The time required for cell division is called as
       1. 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

* + 1. Bacterial cell do not immediately reproduce in new medium for little period is called as phase.
       1. Stationary b) Logarithmic c) Lag d) Death
    2. In what phase of typical bacterial growth curve dose the cell destroy rate exceed than the cell multiplication rate
       1. Lag phase b) Exponential phase c) Stationary phase d) Death phase
    3. When quantity of bacteria is very small, following plating method is used
       1. Pour plate b) Streak plate c) Spread plate d) filtration
    4. method used to know bacterial suspension population from the defined area of microscopic slide.
       1. Direct microscopic count b) Most probable number

c) both (a) & (b) d) None of these

* + 1. The instrument used to measure turbidity is a
       1. Autoclave b) Spectrophotometer c) Incubator d) Fermenter
    2. For filamentous bacteria and moulds, are usually measured by method
       1. Turbidometric b) Dry weight c) All of these d) None of these
    3. Bacteria reproduced by
       1. Fragmentation b) Binary fission c) Budding d) all of these

# 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.

# 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.

**Morphology and fine structure of bacteria**

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

* + 1. Which of the following describes prokaryotic cell membranes?
       1. Selectively permeable b) contains proteins and phospholipids

c) Regulates passage of biomolecules d) all of the above.

* + 1. NAM means:

a) N-acetyl murein b) N-acetyl muramic acid

c) N-acetoyl muramic acid d) None of the above.

* + 1. One of the following is the Gram Positive bacterium.

a) Escherichia coli b) Salmonella typhi

c) Bacillus subtilis d) All of the above

* + 1. Component responsible for bacterial endospore resistance is,

a) Ca-dipicolinate b) Na-dipicolinate

c) colinic acid d) all of the above.

* + 1. Volutin granules are also called as,

a) Babe’s Granules b) PHB Granules

c) Volatile Granule d) None of the above.

* + 1. A “hair” like structure involved in chemotactic response of bacterium is called as-

a) Flagella b) Pilli c) fimbriae d) all of the above

* + 1. 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.

* + 1. NAM means-

a) N-acetylglycosamine b) N-acetylglucosamine

c) N-acetyl gluconamine d) None of the above.

* + 1. A periplasmic space within the cell wall is found in bacteria and the space contains .

a) Gram negative; Peptidoglacan b) Gram positive : lipids

c) Gram negative ; outer membrane d) Gram positive : porin proteins

* + 1. 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.

* + 1. One of the following is the Gram negative bacterium-

a) *Bacillus subtilis* b) *Escherichia coli*

c) *Staphylococcus aureus* d) All of the above.

* + 1. 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

* + 1. 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

# 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 tumbles.
    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 endosperm.
    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 & fimbrae.
    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 endo spore called a resting structure? Explian 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.