



Shree H. N. Shukla College

(Affiliated to Saurashtra University)

Shree H. N. Shukla College Campus, Nr. Lalpari Lake, Bh. Marketing Yard,
Amargadh – Bhichri, Rajkot. Mo. : 97277 53360, 90990 63150

S.Y. B.Sc. Semester 3 Microbiology MB-301 Question bank

1) One Marks Questions.

- 2) The three domains into which all living things are divided are the ____, the ____ and the ____.
- 3) Archaeal membrane lipids contain branched _____ instead of fatty acids.
- 4) Certain members of the Euryarchaeota have the unique ability to produce methane. Such organisms are termed _____.
- 5) Members of the Crenarchaeota are mostly extreme _____.
- 6) The biggest single phylum of bacteria is the _____, which includes many of the best-known Gram-negative species.
- 7) The form of photosynthesis carried out by bacteria such as the purple sulphur bacteria is fundamentally different to that carried out by plants and algae because it is _____.
- 8) The genus *Nitrosomonas* carries out the first step of the nitrification process, converting _____ to _____.
- 9) Acid mine drainage is largely due to the activities of bacteria that are able to oxidise _____ compounds.
- 10) Bacteria such as *Rhizobium* are able to _____ atmospheric nitrogen in association with the roots of _____ plants.
- 11) The genus *Desulfovibrio* is found in _____ conditions, where it _____ sulphur compounds to _____.
- 12) Two main forms of fermentation are found in the enteric bacteria: _____ fermentation and _____ fermentation.
- 13) The pseudomonads can be distinguished from the enteric bacteria because they are -positive and incapable of carrying out _____.
- 14) The extracellular extension possessed by members of the stalked bacteria is called a _____.



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- 15) Some members of the Planctomycetes can carry out ____ reactions, in which ammonia and nitrite are converted to nitrogen gas.
- 16) *Treponema pallidum*, the causative agent of syphilis, belongs to the ____
- 17), a group characterized by their ____ shape and ____ movement.
- 18) ____ is an obligate anaerobe, and the most numerous microorganism in the human gut.
- 19) *Bacillus* and *Clostridium* are Gram-positive genera characterized by their ability to form ____.
- 20) The ____ are branching, filamentous bacteria. One genus, , is the source of many useful antibiotics.
- 21) Cell walls of the genus *Mycobacterium* contain ____ acids.
- 22) Give an example ideal molecular chronometer.
- 23) Jaccard's coefficient
- 24) Who is father of microbial evolution ?
- 25) DNA base composition is calculated by finding ____ of DNA
- 26) Which is not included in Cavalier Smith classification scheme?
- 27) The classification done on the basis of the paleontological analysis (study of fossils) is known as
- 28) What was the primitive genetic material among following in ancient microbes ?
- 29) The mid point of rising curve of DNA denaturation experiment is known as....
- 30) Who introduced numerical taxonomy ?
- 31) What is most widely utilized chronometer ?
- 32) The YM shift describes an alternation between ____ and ____.
- 33) The principal component of fungal cell walls is ____.
- 34) The ____ (or Deuteromycota) is a term used to describe those species in which no sexual reproductive stage has been observed.



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- 35) The Chytridiomycota and the Zygomycota are sometimes termed the _____ fungi.
- 36) The Ascomycota and the Basidiomycota are sometimes termed the _____.
- 37) An aerial hypha that gives rise to spore formation is termed a _____.
- 38) Members of the Ascomycota reproduce asexually by means of spores called _____.
- 39) Unicellular yeasts reproduce asexually by the process of _____.
- 40) The _____ connection is a morphological feature unique to basidiomycetes.
- 41) A mushroom is a fruiting body of a member of the Basidiomycota; its scientific name is a _____.
- 42) *Aspergillus flavus* produces carcinogenic toxins called _____.
- 43) Categorized according to their carbon and energy sources, all fungi are _____.
- 44) Fungi whose cells are separated by cross-walls are described as _____.
- 45) In nutritional terms, all algae are _____.
- 46) Define fungi.
- 47) Define Algae.
- 48) Define Protozoa.
- 49) Define Heterotrophy.
- 50) Define Autotrophy.
- 51) Define parasitism.
- 52) Comment on pseudopodia.
- Describe in short (2 & 3 marks)
- 53) Cyanobacteria
- 54) Purple bacteria
- 55) Pseudomonas
- 56) Spirochaetes
- 57) Bdellovibrio
- 58) Dissimilatory Sulfate Reducer Bacteria
- 59) Filamentous bacteria



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- 60) Methanogens
- 61) Halophiles
- 62) Thermophiles.
- 63) Give an example ideal molecular chronometer.
- 64) Jaccard's coefficient
- 65) Who is father of microbial evolution ?
- 66) DNA base composition is calculated by finding _____ of DNA
- 67) Which is not included in Cavalier Smith classification scheme?
- 68) The classification done on the basis of the paleontological analysis (study of fossils) is known as
- 69) What was the primitive genetic material among following in ancient microbes ?
- 70) The mid point of rising curve of DNA denaturation experiment is known as....
- 71) Who introduced numerical taxonomy ?
- 72) What is most widely utilized chronometer ? Describe the pattern of microbial evolution.
- 73) What is numerical taxonomy?
- 74) Compare and contrast: Phenetic and Phylogenetic Classification.
- 75) Describe classical characteristics used in microbial taxonomy.
- 76) Describe molecular characteristics used in microbial taxonomy.
- 77) How the current advancement in genetical technologies has helped a taxonomist?
- 78) Discuss the sequential improvement of Whittaker's five kingdom concept.
- 79) How might the eukaryotic cell have arisen according to the endosymbiotic hypothesis?
- 80) Briefly describe some ways in which proteins from different organisms can be compared



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- 81) What is “*evolutionary distance*”? Describe Phylogenetic trees.
- 82) What is a natural classification?
- 83) What are phylogenetic (phyletic) and phenetic classification systems? How do the two systems differ?
- 84) What is numerical taxonomy and why are computers so important to this approach?
- 85) Define the following terms: association coefficient, simple matching coefficient, Jaccard coefficient, similarity matrix, phenon, and dendrogram.
- 86) Which pair of species has more mutual similarity, a pair with an association coefficient of 0.9 or one with a coefficient of 0.6? Why?
- 87) Explain taxonomical ranks
- 88) Describe Mol % G + C and its calculation.
- 89) What is endosymbiosis? Explain evolution of microorganisms.
- 90) Summarize the advantages of using each major group of characteristics (morphological, physiological/metabolic, ecological, genetic, and molecular) in classification and identification. How is each group related to the nature and expression of the genome?
- 91) Give examples of each type of characteristic.
- 92) What two modes of genetic exchange in procaryotes have proved taxonomically useful? Why are plasmids of such importance in bacterial taxonomy?
- 93) Briefly describe some ways in which proteins from different organisms can be compared.
- 94) What is the G + C content of DNA, and how can it be determined through melting temperature studies and density gradient centrifugation?
- 95) Discuss the use of G + C content in taxonomy. Why is it not safe to assume that two microorganisms with the same G + C content belong to the same species? In what two ways are G + C content data taxonomically valuable?



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- 96) Describe how nucleic acid hybridization studies are carried out using membrane-bound DNA. Why might one wish to vary the incubation temperature during hybridization? What is the advantage of conducting DNA-RNA hybridization studies?
- 97) How are rRNA sequencing studies conducted, and why is rRNA so suitable for determining relatedness?
- 98) What is microbial taxonomy? Describe various types of classification systems used to arrange the microbial populations.
- 99) Describe major characteristics used in taxonomy for the microbial classification.
- 100) In the light of recent knowledge describe the assessment of microbial evolutionary relationships (or microbial phylogeny)
- 101) Write a note on Metagenomics.
- 102) Discuss the characteristics of algae that are used as a basis for algae classification.
- 103) How are algae similar to and different from higher green plants?
- 104) With the help of suitable diagrams, describe the cell structure of an eukaryotic algae.
- 105) In what ways do the Ascomycetes find their place in industries?
- 106) Describe the different ways by which fungi reproduce asexually.
- 107) Explain the difference between sexual spores and asexual spores, with particular reference to their formation.
- 108) What is the derivation of the name protozoa? How are protozoa distinguished from other eukaryotic protists?
- 109) Describe the food gathering structures found in the ciliated protozoa.
- 110) Name two symbiotic blue green algae.
- 111) Explain chromatic adaptation.
- 112) What are water blooms.
- 113) Name the pigments found in blue green algae.
- 114) Explain the importance of blue green algae in rice fields?
- 115) Name two free living algae involved in nitrogen fixation.
- 116) Explain the mode of reproduction in blue green algae.



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117) Write a note on the economic importance of Protozoa.





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- 118) Why do marine algae vary so much more in shape and size than those found in fresh water?
- 119) How can algae be distinguished from the photosynthetic bacteria?
- 120) What characteristics do euglenoids share with higher plants? With animals? Why are they considered protists?
- 121) Some fungi can reproduce both sexually and asexually. What are the advantages and disadvantages of each?
- 122) Why are most fungi confined to a specific ecological niche?
- 123) The term mushrooming is a proverbial description for expanding rapidly. Why is this an accurate metaphor?
- 124) ► Describe in detail (5 marks)
- 125) Oxygenic phototrophic bacteria
- 126) Anoxygenic phototrophic bacteria
- 127) Archaea
- 128) Family : Enterobacteriaceae
- 129) Family : Pseudomonadaceae
- 130) Endospore forming bacteria
- 131) Non-spore forming bacteria
- 132) Describe sexual reproduction as it occurs in fungi.
- 133) Freshwater algae are distributed worldwide. They rapidly colonize artificial lakes and water impoundments. How do algae accomplish such widespread dispersal?
- 134) Some fungi can be viewed as coenocytic organisms that exhibit little differentiation. When differentiation does occur, such as in the formation of reproductive structures, it is preceded by septum formation. Why does this occur?
- 135) Both bacteria and fungi are major environmental decomposers. Obviously competition exists in a given environment, but fungi usually have an advantage. What is this advantage?
- 136) Classification of Fungi.
- 137) Write general characters of Fungi.



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- 138) Write general characters of Algae.
- 139) Write general characters of Protozoa.
- 140) Differentiate between Fungi, Algae and protozoa.
- 141) Describe in detail reproduction of algae.
- 142) Describe in detail reproduction of protozoa.
- 143) Describe in detail nutrition of Protozoa.
- 144) Write note on ultra structure of algae.
- 145) Write note on habitat of algae.
- 146) Describe asexual reproduction as it occurs in fungi.

