BIOLOGICAL CLASSIFICATION
SOLUTIONS

LEVEL – 1

Question based on Classification System

1. Eubacteria belongs to kingdom Monera
   Slime mould belongs to kingdom Protista
   Fungal cell wall is made of chitin
   Members of kingdom plantae are green and autotrophic
2. Maximum amount of metabolic diversity is shown by organisms belonging to kingdom Monera
3. Cell wall is absent in Mycoplasma
4. Kingdom with most diverse group of organisms is Protista
5. Two kingdom classification given by Linnaeus is based upon Cell wall structure
6. Kingdom Monera is with simple structure and complex behavior.
7. Aristotle was the first to attempt a more scientific basis of classification
8. Aristotle classified plants in herbs, shrubs and trees on the basis of morphological characters
9. Aristotle divided animals in 2 groups on the basis of presence/absence of RBC
10. Two kingdom classification distinguishes on the basis of Cell wall.
11. Whittaker proposed five kingdom classification in 1969.
12. There were 5 kingdoms in Whittaker's classification- Monera,Protista,Fungi,Plantae,Animalia
13. Five main criteria were used by Whittaker for classification.
14. Criteria used by Whittaker were Cell structure, Thallus organization, Mode of nutrition, Reproduction, Phylogenetic relationship.
15. In 2 kingdom classification kingdom plantae included all organisms with cell wall.
16. Common to bacteria, mosses and fungus is presence of cell wall
17. Monera includes all Prokaryotes.
18. Kingdom protista contain unicellular eukaryotes.
19. Chlamydomonas, chlorella, paramecium and amoeba are placed in kingdom Protista.
20. Phylogeny refers to evolutionary relationship
21. Kingdom monera contain bacteria
22. Most abundant micro organism are bacteria
23. Kingdom protista includes,plant like,animal like and fungi like protist hence,Kingdom Protista is not well defined.
24. Plant cells do not have Centriole
25. Nuclear membrane is absent in members of kimgdom Monera.

Question based on Monera

26. Archaebacteria is found in harsh habitats like Marshy area, Salty area, Hot springs
27. Bacteria are very simple in structure but complex in behavior.
    Bacteria Shows most extensive metabolic diversity,most of them show heterotrophic nutrition and play important role for human welfare.
28. Mesosomes are extension of Bacterial cell membrane,functionally helps in Equal distribution of genetic material and are Site of respiration
29. Volutin granules present in bacteria are Polymetaphosphate granules
30. During unfavourable conditions Endospores are formed
31. *Anabaena* is a Cyanobacteria.
32. Cyanobacteria are Photoautotrophs
33. Many bacterial cells are covered with a nonliving extracellular hygroscopic substance, or the slime material called Capsule.
34. Most of the bacteria are heterotrophs
35. Archaebacteria can live in some of the most harsh habitats because of special cell wall structure
36. Methanogen are present in gut of cows and buffaloes and responsible for production of methane from dung of these animals
37. Flagella is the locomotory structure.

38. Cyanobacteria may be unicellular, colonial of filamentous.
39. Specialized cell of *Nostoc* and *Anabaena* fix nitrogen are known as heterocyst
40. Heterotrophic bacteria help in Curdling of milk, production of antibiotic, nitrogen fixation in leguminous plant.
41. All statements mentioned are correct for bacteria.
42. There are two major groups of monerans archaebacteria (ancient bacteria) and eubacteria (true bacteria). Eubacteria is of further two types - bacteria and cyanobacteria. Thermoacidophiles are a type of archaebacteria which live in extremely acidic environment (pH 2) that have extremely high temperatures (upto 110°C). They are found in hot sulphur springs. Some of the eubacteria are also famous for living under the most hostile environment like salt pans, petroleum pans, spilled oil, hot springs, sulphur springs, snow, etc.
43. Methanogens are most abundant in Cattle yard
44. The most abundant prokaryotes helpful to humans in making curd from milk and in production of antibiotics are ones categorized as Heterotrophic bacteria
45. The cyanobacteria are also referred to as Blue green algae
46. Maximum nutritional diversity is found in Monera
47. Pigment-containing membranous extensions in some cyanobacteria are called Chromatophores
48. Anoxygenic photosynthesis is characteristic of Rhodospirillum,rest organisms mentioned release oxygen.
49. The guts of cow and buffalo posses Methanogens
50. Chromatophores take part in Photosynthesis
51. Cell wall is absent in *Mycoplasma*

<u>Question based on Protista</u>

52. Diatoms have cell wall embedded with silica
    Dinoflagellates have cell wall with Silica
    Euglenoids possess pellicle
    Slime mould's only spore shows true cell wall.
53. Mycoplasma can survive without oxygen
    Gonyaulax has cell wall with stiff cellulose plate
    Euglena has pigment similar to higher plant.
    Slime mould forms fruiting body during unfavourable condition
54. Protista is link between Prokaryotic and multicellular eukaryotic organism
55. Diatomaceous earth is largely made up of silicon oxide
56. Kingdom protista includes all of them
57. Chief producers in ocean are chrysophytes
58. Chrysophytes includes all of them
59. Diatomaceous earth is used in polishing, filtration of oils, filtration of syrups
60. In diatoms cell wall forms two thin overlapping shells which fit together as in a soap box
61. Mostly marine, photosynthetic and biflagellate organisms are dinoflagellates
62. Red tide is caused because of *Gonyaulax*
63. *Gonyaulax* releases toxin called Saxitoxin.
64. Euglenoids are found in fresh stagnant water.
65. Euglenoids show mixotrophic mode of nutrition.
66. Euglenoids are biflagellated,possess pellicle and are photosynthetic in presence of sunlight.
67. Euglenoids have flexible body because of protein rich pellicle
68. Pigments of euglenoids are identical to higher plants.
69. Euglena posses two unequal flagella.
70. Protozoans are believed to be the relatives of animals.
71. Amoeboid protozoans show all the mentioned properties.
72. False feet is the characteristic of Amoeboid protozoans
73. eping sickness is caused by *Trypanosoma*
74. *Trypanosoma is flagellated protozoan*
75. Ciliated protozoan possess coordinated movement of rows of thousands of cilia and also have cavity called gullet that opens outside the cell

76. Sporozoans possess spore like stage in life cycle and are infectious
77. Red tide is seen due to Gonyaulax
78. Single–celled eukaryotes are included in kingdom Protista
79. Malaria is caused by Sporozoans
80. Cell walls form two thin overlapping shells which fit together in Chrysophytes

Question based on Fungi

81. Slime moulds are saprophytic, survives on organic matter, producing fruiting bodies during unfavorable condition, spore with cellulosic cell wall and dispersal of spore takes place by air currents.
82. Basis of fungal classification are Morphology of mycelium,mode of spore formation and fruiting bodies.
83. Members of Deuteromycetes play important role in mineral cycling.
84. Albugo belongs to Phycomycetes.
85. Fungi are eukaryotic and heterotrophic
86. Reserve food in the form of glycogen and cell wall made of chitin are characterstics of kingdom Fungi.
87. Gametanginal copulation is commonly found in Zygomycetes.
88. Both bacteria and fungi can form symbiotic relation with plants.
89. All mentioned examples are of fungi
90. Toadstool and *Albugo* both belong to kingdom Fungi
91. Refrigeration prevent food from spoilage by both fungus and bacteria.
92. Mentioned features belong to kingdom Fungi
93. Coenocytic hyphae are continuous tube filled with multinucleated cytoplasm
94. All the matches are correct.
95. All mentioned methods are vegetative.
96. Asexual reproduction in fungus is seen by Conidia,Sporangiospores,Zoospores etc.
97. Asexual reproduction in fungus is exhibited by Oospores,Ascospores,Basidiospores.
98. Sexual reproduction in fungus occurs in following sequential event-
    (Q) Fusion of protoplasm between two motile or non-motile gametes
    (P) Fusion of two nuclei called karyogamy
    (R) Meiosis in zygote resulting in haploid spores
99. Both Ascomycetes and Basidiomycetes show Dikaryophase.
100. Basis of fungal classification are Morphology of mycelium,mode of spore formation and fruiting bodies.
101. Phycomycetes are found in aquatic region, decaying wood in moist and damp place or obligate parasite in plant.
102. Mushroom belongs to Basidiomycetes which forms spores exogenously on basidium.
103. Ascomycetes are mostly multicellular.
104. Unicellular ascomycetes is *Saccharomyces.*
105. *Neurospora* is extensively used in biochemical and genetic work.
106. Phycomycetes show aseptate and coenocytic mycelium.
107. Karyogamy and meiosis occur in basidium produces four basidiospores.
108. Basidiospores and meiosis occur in basidium produces exogenously basidiospores.
109. All the matches given are correct.
110. Mentioned examples belong to Deuteromycetes which do not show sexual reproduction.
111. Deuteromycetes known imperfect fungi because only asexual or vegetative phase are known
112. Many members of deuteromycetes class are decomposers of litter and help in mineral cycling.
113. Mentioned features belong to Deuteromycetes
114. The imperfect fungi which are decomposers of litter and help in mineral cycling belong to Deuteromycetes

Question based on Viruses & Virioids

115. In plant viruses genetic material is generally ssRNA
116. M.W.Beijerinek called the fluid as *Contagium vivum fluidum.*

117. Leaf rust is not a symptom of viral disease in plant.
118. All mentioned features belong to PSTD.
119. Symmetry of viruses is determined by capsomeres in capsid
120. Viroids are Infectious nucleic acids
121. Viruses utilize host machinery for multiplication.
122. A virus consists of a protein coat and nucleic acid molecules
123. Viruses contain either DNA or RNA
124. All mentioned properties are true for Viroids.
125. Virus has capsid whereas viroids lack it and contain free RNA.
126. Acellular organisms are both Virus and Viroids.
127. Virus is inert crystalline structure outside the living cell
128. 'Virus' means venom or poisonous fluid
129. 'Virus' name was given by Beijerinek
130. Contagium vivum fluidum (infections living fluid) name given to fluid extract from infected tobacco plant was given by Beijerinek
131. All features mentioned are true for Virus.
132. Stanley showed that virus can be crystallised.
133. Viruses contain either DNA or RNA
134. Viruses which infect animals have single standard RNA, double standard RNA, double standard DNA.
135. Bacteriophage generally have double standard DNA
136. Capsomeres may be arranged in helical or polyhedral
137. All the mentioned infections can be observed in plants.
138. Viral diseases are Mumps,Small pox, Herpes,Influenza,Turnip mosaic.
139. Potato spindle tuber disease is caused by viroids
140. 'Viroids' were identified by T.O. Diener
141. Viroids are free RNA
142. The molecular weight of RNA of viroid is low
143. Virus envelope is known as Capsid
144. Tobacco mosaic virus shows coiled RNA strand and capsomeres
145. Viruses have DNA enclosed in a protein coat

Question based on Lichens

146. Lichen are symbiotic association between algae and fungus
147. In lichen, algal component is called phycobiont and fungal component is called mycobiont.
148. Fungus is heterotrophic in lichen.
149. All mentioned features are true for Lichens
150. Algae provides nutrition to fungal component.

LEVEL – 2

Question based on Monera

1. Bacteria is grouped under four categories on the basis of shape -Bacillus,Coccus,Spirillum,Vibrio. Bacterial structure is very simple and very complex behaviour.
2. Organisms inhabiting -salty area,hot springs,marshy area are called Halophiles,Thermoacidophiles and Methanogens respectively.
3. The incorrect statement is (R) Heterotrophic bacteria are most abundant in nature.
4. Diseases caused by Bacteria are Citrus canker,Cholera,Typhoid,Tetanus.
5. All mentioned features are of Mycoplasma.
6. A is flagella;
   B,C,D are spirillum,cocci and vibrio respectively
7. 'A' labelled in the diagram is endospore
8. 'A' labelled in the diagram is Heterocyst
9. NCERT XI Pg.20

10. The mentioned diagram is of filamentous blue green algae which helps in nitrogen fixation.
11. The autotrophs mentioned are Nostoc,Chara,Porphyra,Wolffia
12. Chemosynthetic autotrophic bacteria oxidise various inorganic substances.

Question based on Protista

13. Members of protista are primarily aquatic.
14. Cell walls of Chrysophytes are embedded with Silica.
15. Mentioned features belong to Dinoflagellates
16. Spores are dispersed by air currents.

17. Mentioned features belong to Protozoans
18. Euglenoids are surrounded by protein rich layer known as pellicle.
19. XI NCERT Pg.21
20. (1) Paramecium and Plasmodium belong to kingdom Protista,whereas Penicillium belongs to Kingdom Fungi
    (2) Lichen is a composite organism formed from the symbiotic association an algae and a Fungi
    (4) Nostoc and Anabaena are examples of Cyanobacteria.

Question based on Fungi

21. Fungi show great diversity in morphology and habitat.
22. Examples belonging to Ascomycetes are
    Penicillium,Yeast,Claviceps,Neurospora,Aspergillus,Morels,Truffles
23. Mentioned features are of Ascomycetes.
24. All features except 8 and 9 belong to kingdom animalia.
25. XI NCERT Pg.23
26. Alternaria belongs to Deuteromycetes,whose asexual forms are only known.
27. Morels and Truffles are edible mushrooms.

Question based on Viruses & Virioids

28. XI NCERT Pg.26
29. Viruses may have helical or polyhedral symmetry.
31. Viroids were discovered by T.O Diener.

PREVIOUS YEAR QUESTION

Question based on Classification System

1. Chlamydomonas, chlorella, paramecium and amoeba are placed in kingdom Protista.
2. (2) Nostoc and Anabaena are examples of Cyanobacteria.
   (3) Paramecium and Plasmodium belong to kingdom Protista,whereas Penicillium belongs to Kingdom Fungi
   (4) Lichen is a composite organism formed from the symbiotic association an algae and a Fungi
3. Five kingdom classification was given by R.H.Whittaker in 1969.
4. Algae belongs to kingdom plantae;
   Phycomycetes belong to kingdom Fungi;
   Euglenoids belong to kingdom Protista;
   Archaebacteria belongs to kingdom Monera.
5. Five kingdom classification was given by R.H.Whittaker in 1969.
6. Four kingdoms including eukaryotic organisms are kingdom Protista,Fungi,Plantae,Animalia.
7. In Whittaker's system of classification prokaryotes are placed in the kingdom Monera
8. Two kingdoms constantly figured in all biological classification are Plantae and Animalia

9. Tracheophyta consists of Pteridophytes, Gymnosperms and Angiosperms
10. Carolus Linnaeus gave a sexual system of classification which was based on numerical relation of floral parts.
11. Archaebacteria are found in extreme saline conditions.
12. Glycocalyx provides sticky character to the bacteria cell.
13. Mycoplasma are the smallest living cells, known without a definite cell wall, pathogenic to plants as well as animals and can survive without oxygen.

Question based on Monera

14. Maximum nutritional diversity is found in Monera.
15. Nostoc belongs to kingdom Monera.
16. The cyanobacteria are also referred to as Blue green algae.
17. Bacteria differ from plants in that they do not have a well defined nucleus.
18. Teichoic acid is present in Cell wall of Gram positive bacteria.
19. A peculiar odour that prevails in marshy areas & cow-sheds is on account of a gas produced by Archaebacteria
20. Oscillatoria exhibits oxygenic photosynthesis.
21. Escherichia coli is a Gram negative bacterium.
22. The main difference betweeen Gram positive and Gram negative bacteria is Cell wall.
23. According to five kingdom classification bacteria belong to Monera.
24. Some hyperthermophilic organisms that grow in highly acidic (pH 2) habitats belong to the two groups Eubacteria and archaea.
25. Streptococcus belongs to kingdom Monera.
26. Archaebacteria are likely to be present in deep sea water.
27. Bacteria that fix CO2 by using chemical energy as source, are Chemoautotrophs
28. Nostoc belongs to kingdom Monera.
29. Plasmids are mostly found in Bacteria
30. Bacteria divides once in every 20 mins
    In 2 hours i.e. 120 mins,it will show 120/20 generations forming 64 cells.
31. Endospores actually help in Dispersal and perennation
32. Heating milk at 65°C followed by sudden cooling is known as Pasteurization
33. Facultative anaerobic bacteria are aerobes but can live anaerobically also.
34. Endospores are formed during unfavourable condition.
35. Anabaena forms a symbiotic association with Azolla.
36. The autonomously independent self replicating extra nuclear DNA imparting certain factors to some bacterium is called Plasmid.
37. Transformation was identified by Griffith.
38. The kingdom of prokaryotes is Monera.
39. In the light of recent classification of living organisms into three domains of life, Archaea have some noble features that are absent in other prokaryotes and eukaryotes.
40. Bacteria divides every 35 mins,thus,in 175 mins it will show 175/35 generations i.e.5 generations.
    Culture containing 105 cells/ml will form 25*105 after 175 mins.
41. Cell wall of both Bacteria and fungi consist of N-acetylglucosamine.
42. Slime mould belongs to kingdom Protista.
43. Monerans and Fungi both are ecologically similar.
44. Bacterial chromosome is called Genophore.
45. R gene on plasmid is meant for Drug resistance
46. Lysozyme that is present in saliva and tears destroys certain types of bacteria
47. Measles is caused by Virus.
48. The cell wall of bacterium is made up of Peptidoglycan
49. Plasmids occur in Bacteria
50. Site of respiration in bacteria is Mesosome.
51. Transformation experiment was first performed on Diplococcus pneumoniae.
52. A plasmid can replicate independently
53. The bacterial cells are surrounded by a capsule mainly made up of Polysaccharides

54. Bacterial flagella do not show ATPase activity and 9 + 2 organization. These are chemically formed of Flagellin.
55. DNA as the transforming principle was first shown by Avery, Macleod and McCarty
56. Bacteria with single flagella at one end is called monotrichous
57. Lactobacillus casei and Streptococcus thermophilis responsible for the formation and flavour of yoghurt.
58. O2 does not evolved in photosynthesis of Bacteria
59. Plasmid is Extrachromosomal DNA in bacterial cell
60. Pasteurization is Heating of liquid between 65°C to 80°C followed by rapid cooling
61. The wall of bacteria consists of N-acetylglucosamine & N-acetyl muramic acid
62. A unique amino acid in the cell wall of Bacteria and BGA is Diaminopimelic acid
63. F plasmid refers to Fertility plasmid
64. All mentioned features belong to kingdom Monera.
65. Bacteria do not have double membrane bound organelles like mitochondria
66. Vinegar is synthesized using Acetobacter aceti.
67. A bacterial cell contains Mesosome, nucleoid and thylakoids.
68. Episomes are extrachromosomal hereditary material of bacteria associated with nucleoid
69. Mesosome in a bacterial cell is formed by infolding of plasma membrane.
70. Nucleic acid is the hereditary material in bacteria.
71. Rhizobium is symbiotic bacteria,which shows symbiosis with legumes for fixing nitrogen.
72. Bacterial flagella is made up of Protein called Flagellin.
73. Pseudomonas is useful because of its ability to decompose variety of organic compounds
74. (3)
75. Capsule is not found in all Bacterial cells.
76. Inclusion body serves as densely packed reserve for material and energy in a bacterial cell.
77. F-factor in bacteria is a Plasmid
78. The types of ribosomes found in prokaryotic cell is 70 S
79. Reproduction in most of the bacteria is by Binary Fission
80. Chromosomes in a bacterial cell can be 1-3 in number and are always circular
81. Both Blue green algae and Rhizobium fix nitrogen.
82. Cyanobacteriun is an Alga having blue-green pigment
83. Gram negative bacteria during bacterial staining stains red.
84. Circular free DNA is found in bacteria
85. Chlorophyll-a is absent in Bacteria.
86. Bacteria is responsible for recycling of material.
87. Bacterium having flagella with all over body is known as Peritrichous
88. Cell wall of Gram positive bacteria is made up of Murein
89. Albugo is a fungi.
90. Mycoplasma are the organism that completely lack cell wall, they are the smallest living cells known and can survive without oxygen
91. The smallest free-living organism is Mycoplasma
92. Mycoplasma do not have cell wall,and hence are not sensitive to Penicillin.
93. Pigment containing membranous extensions in some cyanobacteria are Chromatophores
94. The motile bacteria are able to move by flagella
95. Archaebacteria have a different cell membrane structures than other bacteria. The lipids in archaebacteria cell membranes are ether-linked compared to ester-linked in other bacteria. Archaebacteria are similar to bacteria in morphology, structure, shape, mode of reproduction and nutrition.
96. Anoxygenic photosynthesis is characteristic of Rhodospirillum
97. Anabaena is a prokaryote.
98. The primitive prokaryotes responsible for the production of biogas from the dung of ruminant animals, include the Methanogens
99. Eubacteria are also called true bacteria.
100. Methanogens belong to Archaebacteria

Question based on Protista

101. Chrysophytes have indestructible wall layer deposited with silica
102. Single-celled eukaryotes are included in Protista
103. Protists are eukaryotic
104. Slime moulds are fungus like in one phase of their life cycle and Amoeba like in another phase of their life cycle.
105. A kingdom common to unicellular animals and plants is Protista.
106. Slime moulds saprophytic, plasmodium without walls, spores dispersed by air currents
107. Protista includes Unicellular eukaryotes
108. Euglena belongs to Euglenoid
Gonyaulax belongs to Dinoflagellates
Paramoecium belongs to Protozoans
109. Physarum is a slime mould
110. Silica gel (Kieselguhr) / diatomite is obtained from Fossilised radiolarians and diatoms
111. The thalloid body of a slime mould (Myxomycetes) is known as Plasmodium
112. Diatoms are placed in kingdom Protista
113. Plasmodium is an Endoparasite
114. Euglenoid species that have chlorophyll are Facultative autotrophs
115. Protists are Unicellular,eukaryote,autotroph or heterotroph.
116. Murein is not found in the cell wall of Diatoms.
117. Protists obtain their food as Photosynthesis and heterotrophs
118. Chrysophytes, Euglenoids, Dinoflagellates and Slime moulds are included in Protista
119. The walls of diatoms are non-destructible
120. Diatoms are known as chief producers in the oceans.
121. Ciliates differ from all other protozoans in having two types of nuclei

Question based on Fungi

122. Yeast is used in the production of Bread and beer
123. Glomus forms symbiotic association with plants and helps them in their nutrition
124. Puccinia — Rust fungi
125. Ringworm in humans is caused by Fungi
126. Birds nest fungi and puffballs belongs to Basidiomycetes
127. Industrial production of ethanol from starch is brought about by certain species of Saccharomyces
128. Mycorrhizae helps in mineral uptake from soil
129. Fungal growth is seen at temperature of about 25°C,relative humidity of about 95%, a shady place.
130. Rust, smut and mushroom bear Basidiocarps.
131. Major components of cell wall of most fungi is Chitin
132. Fungi possess chitinous walls.
133. Agaricus shows exogenous spore production.
134. Pseudopodia are locomotory and feeding structures in Amoeboid protozoans
135. Yeast is unicellular.

Question based on Viruses &Viriods

136. Infectious proteins are present in Prions
137. Virus envelope is known as Capsid
138. T.O. Diener discovered a Free infectious RNA
139. Some virus has RNA as genetic material Eg.Plant viruses.
140. Viruses have DNA enclosed in a protein coat
141. Tobacco mosaic virus shows coiled RNA strand and capsomeres
142. Infective constituent in viruses is the genetic material.
143. NCERT XI – Pg 27
144. Option (b), (c) and (d) are correct

Whereas option (a) is incorrect because inclusion bodies are nuclear or cytoplasmic aggregates of proteins. They represent sites of viral multiplication in a bacterium or a eukaryotic cell and usually consist of viral capsid proteins. They are not involved in ingestion of food particles.

145. Cyanobacteria or blue –green algae are photosynthetic organisms which perform oxygentic photosynthesis. They have the ability of nitrogen fixation due to the presence of large pale cells called heterocyst in their filaments. Due to the presence of thick walls, heterocysts are impermeable to oxygen.

146. The size of various organisms/cells are Pleuropneumonia like organism (PPLO)-O.1 μm

Viruses-0.02– $0.2\mu m$

Bacterial cell – $1-2\mu m$

Eukaryotic cell – $10-20\mu m$

147. Statement in option (2) is correct

Plasmogamy, the fusion of two protoplasts (the contents of the two cells), brings together two compatible haploid nuclei. At this point, two parent cells are present in the same cell, but the nuclei have not yet fused.

Incorrect statements can be corrected as organisms that can fix atmospheric nitrogen in specilaised cells are called heterocyst.

Karyogamy is nothing but the fusion of two nuclei means production of diploid cell (2n condition)

Organisms that depends on living plants are called heterotrophs.