## Chapter 4

# **Biological Classification**

## Solutions (Set-1)

#### **SECTION - A**

#### School/Board Exam. Type Questions

#### Very Short Answer Type Questions :

- 1. What are monerans?
- Sol. Unicellular prokaryotes
- 2. Why some fungi are called 'fungi imperfecti'?
- Sol. Because they lack perfect (sexual) stage.
- 3. Who coined term virus?
- Sol. Louis Pasteur
- al cell wall. Name the chemical substance present in the bacterial cell wall. 4.
- Sol. Peptidoglycan
- 5. Expand TMV.
- Sol. Tobacco Mosaic Virus
- Who classified plants into herbs, shrubs and trees? 6.
- Sol. Aristotle
- 7. Who classified animals into Anaima and Enaima?
- Sol. Aristotle
- Red tide causing organism belongs to which group of photosynthetic protists? 8.
- Sol. Dinoflagellates
- 9. First scientific approach to classify the organisms was done by \_\_\_\_\_.
- Sol. Aristotle
- 10. Give the mode of nutrition in fungi.
- **Sol.** Heterotrophic (Saprophytic/Parasitic)

#### Short Answer Type Questions

Sol.

11. According to two kingdom classification system, differentiate kingdom Plantae and Animalia in terms of cell wall, locomotion, nutrition and response to external stimuli.

Characters	Plantae	Animalia
1. Cell wall	Present	Absent
2. Locomotion	Absent	Present
3. Nutrition	Autotrophic	Heterotrophic
4. Response to external stimuli	Slow	Quick
5. Contractile vacuole	Absent	Present

- 12. Write down three drawbacks of two-kingdom classification system.
- Sol. This system did not distinguish between :
  - (i) Unicellular and multicellular organisms.
  - (ii) Eukaryotes and prokaryotes.
  - (iii) Photosynthetic (green algae) and non-photosynthetic (fungi) organisms.
- 13. In which kingdom, Whittaker placed *Chlamydomonas* and *Chlorella*? What was the earlier position of these organisms in two-kingdom system?
- **Sol.** He included them under kingdom Protista and earlier these were placed in Algae within plants and both having cell walls.
- 14. Why do we expect the criteria of classification to change in the future?
- **Sol.** As our understanding of characteristics and evolutionary relationship improve, we expect changes in classification to occur.
- 15. Which type of similarities are reflected in existing classification system?
- **Sol.** This existing classification reflects not only the morphological, physiological and reproductive similarities, but is also phylogenetic *i.e.* based on evolutionary relationship.
- 16. What are the sole members of the kingdom Monera and mention about their habitat?
- **Sol.** Bacteria are the sole members of kingdom Monera. They live everywhere and also in extreme habitats like hot springs, deserts, snow and deep oceans.
- 17. Give a characteristic feature of kingdom Monera, in terms of their nucleus and cell wall (composition).
- Sol. (i) Nucleoid or incipient nucleus is composed of naked DNA, RNA and non-histone proteins.
  - (ii) Cell wall is made up of peptidoglycan except in Archaebacteria.
- 18. Which type of nutrition and reproduction is found in kingdom Monera?
- **Sol.** Sole members of kingdom Monera are bacteria in which some are autotrophic and vast majority are heterotrophic.

They reproduce mainly by fission. Sometimes they produce spores under unfavourable conditions.

- 19. How are bacteria grouped on the basis of their shape?
- **Sol.** (i) The spherical Coccus (pl.: cocci).
  - (ii) The rod-shaped Bacillus (pl.: bacilli).
  - (iii) The comma-shaped Vibrium (pl.: vibrio).
  - (iv) The spiral Spirillum (pl.: spirilla).
- 20. Why Archaebacteria are special?
- **Sol.** Archaebacteria are special as they live in some of the harsh habitat such as extreme salty area (halophiles), hot springs (thermoacidophiles) and marshy areas (methanogens).
- 21. Which feature of Archaebacteria allow them to survive in extreme conditions?
- Sol. They (Archaebacteria) can survive in extreme conditions because of their different cell wall structure.
- 22. Give two example of Methanogens, Halophiles and Thermoacidophiles.

#### Sol. Methanogens :

- (i) Methanococcus
- (ii) Methanobacterium

#### Halophiles :

- (i) Halobacterium
- (ii) Halococcus
- Thermoacidophiles :
- (i) Thermoplasma
- (ii) Thermoproteus
- 23. How are bacteria classified on the basis of their mode of nutrition?



- 24. Why are cyanobacteria called photosynthetic autotrophs?
- **Sol.** Cyanobacteria are also known as blue-green algae. They have chlorophyll, similar to the chlorophyll present in plants which help them to perform photosynthesis. Hence, they are known as photosynthetic autotrophs.
- 25. In which habitat cyanobacteria exist? Give their effect on aquatic animals.
- **Sol.** These live in marine and terrestrial conditions. They cause algal bloom in polluted water. They also deplete the oxygen from the water reservoir and thereby cause large scale death of the aquatic animals.
- 26. Why chemosynthetic bacteria oxidise inorganic substances?
- **Sol.** They oxidise various inorganic substances such as nitrates, nitrites and ammonia and use the released energy for their ATP production.

#### 4 Biological Classification

- 27. Write a note on the uses of heterotrophic bacteria.
- **Sol.** These are most abundant in nature. The majority are important decomposers. Many of them have a significant impact on human affairs. They are helpful in making curd from milk, production of antibiotics, fixing nitrogen in legume roots etc.
- 28. Mention the damage caused by pathogenic bacteria to human beings.
- **Sol.** They cause damage to human beings, crops, farm animals and pets. Cholera, typhoid, tetanus, citrus canker are the well-known diseases caused by different bacteria.
- 29. Write a note on Mycoplasma.
- **Sol.** The *Mycoplasma* are organisms that completely lack a cell wall. They are smallest living cells known and can survive without oxygen. Many *Mycoplasma* are pathogenic *i.e.* cause various diseases in plants, animals and human beings.
- 30. Discuss the habitat and mode of nutrition of chrysophytes.
- **Sol.** Chrysophytes include diatoms and golden algae (desmids). They are found both in fresh and marine water. They are microscopic and float passively in water currents. Most of these members are autotrophic (*i.e.* photosynthetic).

#### Long Answer Type Questions

- 31. Give five features of dinoflagellates and their impact on marine ecosystem.
- **Sol.** (i) They are photosynthetic protists.
  - (ii) Most of them are marine.
  - (iii) They may appear red, yellow, green, brown or blue depending upon the main pigment present in their cells.
  - (iv) The cell wall has stiff cellular plates on the outer surface.
  - (v) Most of them have two flagella.

#### Impact :

- Very often, the red dianoflagellates undergo rapid multiplication and make the sea to appear red causing the 'red tide'.
- (ii) Some dianoflagellates are poisonous to vertebrates. When they are in large number, they produce the toxin into the sea water which kills fishes and other aquatic animals.
- 32. (a) Write a note on the mode of nutrition in *Euglena*.
  - (b) Explain the reproduction in Euglena.
- **Sol.** (a) *Euglena* shows mixotrophic type of nutrition. Generally, *Euglena* shows autotrophic type of nutrition but during prolonged darkness, it obtains nutrition from dead and decaying substances. It has more than one type of mode of nutrition, hence it is mixotrophic.
  - (b) In *Euglena*, asexual reproduction takes place by longitudinal fission starting at flagellar end. The flagellum is duplicated before the cell divides.
- 33. (a) How do slime moulds aggregate?
  - (b) How do slime moulds form fruiting bodies and how they are extremely resistant?

- Sol. (a) They are saprophytic protists. Their body moves along decaying twigs and leaves by engulfing organic material. Under favourable conditions, they form an aggregation called plasmodium which may grow and spread over several feet.
  - (b) During unfavourable conditions, the plasmodium differentiates and forms fruiting bodies bearing spores at their tips. These spores have true walls. They are extremely resistant and survive for many years, even under adverse conditions.
- 34. (a) Mention the diversity of fungi.
  - (b) Give an account of their habitat.
  - (c) Why they are regarded as heterotrophs?
  - (d) In what way they are useful?
  - (e) What is mycorrhiza?
- **Sol.** (a) Fungi include diverse organisms which range in structure from unicellular yeasts to highly complex edible mushrooms and non-edible toad stools.
  - (b) They are cosmopolitan in occurrence being present in air, water, soil and on the animals and plants. They are more abundant in warm and humid areas.
  - (c) They are unable to manufacture their own food because of the absence of chlorophyll. Therefore, they are regarded as heterotrophs.
  - (d) They (yeast) are used in making bread and beer. Some fungi are also useful in preparing antibiotics as penicillin.
  - (e) The association of fungi with the roots of higher plants is called mycorrhiza.
- 35. (a) Discuss fragmentation, budding and fission in fungi.
  - (b) What is coenocytic hyphae?
- Sol. (a) Reproduction in fungi occurs by fragmentation, budding and fission.

In fragmentation, the mycelium breaks up into two or more segments due to mechanical injury, decay etc. Each fragment grows to form the complete mycelium.

In budding (*e.g.* yeast), the parent cell shows protrusion at one end. The protrusion grows into a bud which ultimately separates as a new individual.

In fission, the unicellular fungus like yeast divides into two daughters through division or fission of the cell.

- (b) Some hyphae are continuous tubes filled with multinucleated cytoplasm, these are called coenocytic hyphae.
- 36. Explain sexual reproduction in Basidiomycetes and give three examples of this group.
- **Sol.** In Basidiomycetes, the sex organs are absent, but plasmogamy is brought about by fusion of two vegetative or somatic cells of genetically different strains. The resultant structure is dikaryotic which give rise to basidium, where karyogamy and meiosis take place. Two compatible nuclei fuse to form zygote, which undergoes meiosis and forms four basidiospores. So, the sexual spores called basidiospores are generally four in number. They are exogenous (*i.e.* produced outside the body). The fruiting body containing basidia is a multicellular structure called basidiocarp.

Examples : Agaricus, Ustilago and Puccinia.

- 37. (a) Why some fungi were grouped under Deuteromycetes?
  - (b) Why the fungi imperfecti were moved into classes Ascomycetes and Basidiomycetes?
  - (c) How these fungi reproduce asexually?
  - (d) What is the mode of nutrition in members of Deuteromycetes and how some of them help in mineral cycling?
- **Sol.** (a) There is only asexual and vegetative phase known, so these are commonly regarded as imperfect fungi. Hence, they were placed under class deuteromycetes.
  - (b) By the establishment of linkages, when the perfect stage (or sexual form) of these fungi were discovered, they were moved out of deuteromycetes to ascomycetes and basidiomycetes.
  - (c) The deuteromycetes reproduce by asexual spores known as conidia.
  - (d) Some of them are saprophytes or parasites while large number of them are decomposers of litter (organic matter) and help in mineral cycling.
- 38. (a) Explain alternation of generation in kingdom Plantae.
  - (b) Do few members of kingdom Plantae have partially heterotrophic mode of nutrition, if yes, then give example?
  - (c) Differentiate between kingdom Plantae and Animalia on the basis of growth pattern.
- **Sol.** (a) In plants, life cycle has two distinct phases *i.e.* the diploid sporophytic and haploid gametophytic that alternate with each other. This phenomenon is called alternation of generation.
  - (b) Few members of kingdom Plantae are partially heterotrophic such as insectivorous plants *e.g.* bladderwort and venus fly tap or parasite like *Cuscuta*.
  - (c) The members of animal kingdom follow definite growth pattern and grow into adult that have a definite shape and size which in case of plants growth is irregular.
- 39. Give the contribution of D.J. Ivanowsky, M.W. Beijerinck and W.M. Stanley for studying viruses.
- Sol. D.J. Ivanowsky (1892) recognised certain microbes which is the causal organism of the mosaic disease of tobacco. These were found to be smaller than bacteria because they passed through bacteria-proof filters.
  M.W. Beijerinek (1898) demonstrated that the extract of the infected plants of tobacco could cause infection in healthy plants and called this fluid as *Contagium vivum fluidum* (infectious living fluid).

W.M. Stanley (1935) crystallised TMV (Tobacco Mosaic Virus) for the first time. He showed that viruses could be crystallised and crystal consists largely of proteins.

- 40. (a) What is bacterial virus?
  - (b) What is advantage of capsomeres?
  - (c) Do viruses have their own genetic material?
  - (d) Name the infectious part of virus.
- Sol. (a) Bacterial viruses or bacteriophages are the viruses that infect the bacteria.
  - (b) Viruses have protein coat called capsid made of small subunits called capsomers for the protection of nucleic acid.
  - (c) In addition to proteins, viruses also have their own genetic material in the form of RNA or DNA.
  - (d) The infectious part of viruses is genetic material.

41. Tabulate the characteristics of five kingdom, on the basis of cell type, cell wall, nuclear membrane, body organisation and mode of nutrition.

#### Sol.

Characters	Five Kingdoms							
Gliaracters	Monera	Protista	Fungi	Plantae	Animalia			
Cell type	Prokaryotic	Eukaryotic	Eukaryotic	Eukaryotic	Eukaryotic			
Cell wall	Non-cellular (Polysaccharide + amino acid)	Present in some	Present (without cellulose) with chitin	Present (cellulose)	Absent			
Nuclear membrane	Absent	Present	Present	Present	Present			
Body organisation	Cellular	Cellular	Multicellular/ loose tissue	Tissue/organ	Tissue/organ/ organ system			
Mode of nutrition	Autotrophic (chemosynthetic and photosynthetic) and Heterotrophic (saprophyte/parasite)	Autotrophic (Photosynthetic) and Heterotrophic	Heterotrophic (Saprophytic/Par asitic)	Autotrophic (Photosynthetic)	Heterotrophic (Holozoic/ Saprophytic etc.)			

- 42. (a) Write a short note on methanogens.
  - (b) Write the shape of Coccus, Bacillus, Vibrio and Spirillium type of bacteria.
- Sol. (a) These bacteria are of marshy habitat. They are capable of converting CO<sub>2</sub>, methanol and formic acid into methane so named methanogens. These methanogens are present in the guts of several ruminant animals such as cows and buffaloes and they are responsible for the production of methane (biogas) from the dung of these animals.

Example : Methanococcus, Methanobacterium etc.

- (b) (i) Coccus : Spherical
  - (ii) Bacillus : Rod-shaped
  - (iii) Vibrio : Comma-shaped
  - (iv) Spirillum : Spiral-shaped
- 43. What are halophiles?
- Sol. These bacteria live in extreme saline environment such as salt lakes, sea, brines etc.

In strong light, these halophiles develop a pigmented membrane (purple membrane) composed of a pigment called bacterio-rhodopsin to harness the sun's energy. The light energy is utilised to carry on ATP production but not for food synthesis.

#### Example : Halobacterium and Halococcus.

- 44. Write an explanatory note on thermoacidophiles.
- **Sol.** These are capable of tolerating high temperature as well as high acidity and hence, the name thermoacidophiles. They often live in hot water springs where the temperature is as high as 80°C and the pH as low as 2. They oxidise sulphur to sulphuric acid under aerobic conditions and the energy obtained in this reaction is utilised for the synthesis of organic food. The medium becomes highly acidic due to the production of sulphuric acid. Under anaerobic conditions sulphur is reduced to H<sub>2</sub>S, hence these are chemosynthetic in nature.

Example : Thermoplasma, Thermoproteus etc.

- 45. Write a note on :
  - (a) Mycorrhiza
  - (b) Sac fungi
  - (c) Imperfect fungi
- **Sol.** (a) The symbiotic association of a fungus with the root of higher plant is called **Mycorrhiza**.
  - (b) Ascomycetes are commonly known as sac-fungi. They are unicellular or multicellular. Sac like ascus contains ascospores.
  - (c) Deuteromycetes are known as imperfect fungi because only the asexual or vegetative phases of these fungi are known.

#### **SECTION - B**

#### Model Test Paper

#### Very Short Answer Type Questions

- Who proposed six kingdom system of classification? 1.
- Sol. Carl Woese
- FEL FOUNDS Intent 2. What name was given to animals having RBCs by Aristotle?
- Sol. Enaima
- 3. What is the mode of nutrition in kingdom Animalia?
- **Sol.** Heterotrophic (Holozoic)
- Name the type of ribosomes present in Monerans. 4.
- Sol. 70S type
- 5. Carl Woese divided bacteria into two groups. Name them.
- Sol. Archaebacteria and Eubacteria
- 6. What is the habitat of halophiles?
- Sol. Salty areas
- 7. Name the group of bacteria under which methanogens, halophiles and thermoacidophiles are included?
- Sol. Archaebacteria
- 8. Which group of bacteria are characterised by the presence of rigid cell wall?
- Sol. Eubacteria
- 9. How can we say that cyanobacteria are photosynthetic autotrophs?
- Sol. They have chlorophyll-a which is similar to the chlorophyll present in plants. Hence, these are known as photosynthetic autotrophs.
- In which way, heterotrophic bacteria are useful for human being? 10.
- **Sol.** Majority of these bacteria are decomposers. Many of them have a significant impact on human affairs. They are helpful in making curd from milk, production of antibiotics, fixing nitrogen in legume roots etc.

#### Short Answer Type Questions

- 11. In what way sexual reproduction of bacteria is different from eukaryotic organisms?
- **Sol.** Bacteria exhibit a primitive form of sexual reproduction which differs from eukaryotic sexual reproduction because there is no gamete formation and fusion.
- 12. Which essential feature of sexual reproduction is not performed by bacteria?
- Sol. The essential feature of sexual reproduction *i.e.* fertilisation and meiosis does not take place.
- 13. Mention the type of reproduction in Protists.
- **Sol.** Protists reproduce asexually and sexually by a process involving cell fusion and zygote formation.
- 14. What is pellicle and what is its advantage in Euglenoids?
- **Sol.** Euglenoids lack cell wall. At the place of cell wall, a protein-rich layer, pellicle present which makes their body flexible.
- 15. What are basidiocarps?
- Sol. Basidiocarps are fruiting bodies, developed in sexual reproduction in the members of basidiomycetes.

#### Short Answer Type Questions

- 16. Explain the structure of cell wall in diatoms.
- **Sol.** The body of diatoms is covered by a transparent siliceous shell. The shell is made up of two valves *i.e.* epitheca and hypotheca. These two valves fit together like a soap box.
- 17. How diatomaceous earth is formed? Write its advantage.
- **Sol.** Silica shells of dead diatoms are nearly indestructible and these get accumulated at their habitat. Such huge rock-like deposits of hard shells of diatoms constitute diatomaceous earth. Being gritty, the soil of diatomaceous earth is used in polishing, filtration of oils and syrups.
- 18. What is the reason of keeping food into refrigerator?
- **Sol.** When we put food into refrigerator, it provides low temperature. So, microorganisms like fungi and bacteria become inactive. The enzymatic activity is low. Due to this reason, microorganisms will not multiply and food will not get spoiled.
- 19. How asexual reproduction takes place in fungi?
- **Sol.** Asexual reproduction occurs through spores called conidia or sporangiospores or zoospores. These are singlecelled specialised structures which separate from the organism, get dispersed and germinate to produce new mycelium after falling on suitable substratum.
- 20. (a) Name the common forms of basidiomycetes.
  - (b) What is the habitat of basidiomycetes?
  - (c) Which type of mycelium do they have?
- Sol. (a) Mushrooms, bracket fungi or puffballs are the common forms of basidiomycetes.
  - (b) They can grow in soil, on logs, tree stumps and live in plant bodies as parasite.
  - (c) The mycelium of these basidiomycetes is branched and septate.

- 21. (a) In what way *Neurospora* is useful?
  - (b) Edible morels and truffles belong to which group of fungi?
  - (c) What is Contagium vivum fluidum?
- **Sol.** (a) *Neurospora* is used extensively in biochemical and genetic researches.
  - (b) Ascomycetes
  - (c) It is the extract of the infected plants of tobacco could cause infection in healthy plants, this fluid is called *Contagium vivum fluidum* (infectious living fluid). It was demonstrated by M.W. Beijerinck.

#### Long Answer Type Questions

- 22. (a) Give the symptoms of plant diseases caused by viruses.
  - (b) Name a disease caused by viroid.
  - (c) How algae and fungi take benefit from each other in association as lichens?
- **Sol.** (a) In plants, the symptoms of the viral disease are mosaic formation, leaf rolling and curling, yellowing and vein clearing, dwarfing and stunted growth.
  - (b) Potato spindle tuber disease.
  - (c) In this association, algae prepare food for fungi and fungi provides shelter and absorb mineral nutrients and water for its partner.
- 23. (a) What are heterocysts?
  - (b) Write a note on dikaryophase.
  - (c) Differentiate kingdom Protista and Fungi in terms of their nutrition.
- **Sol.** (a) The cyanobacteria can fix atmospheric nitrogen in specialised cells called heterocysts.
  - (b) In the members of ascomycetes and basidiomycetes, an intervening diakaryotic stage (n + n, *i.e.*, two nuclei per cell) occurs, such condition is called a dikaryon and the phase is called dikaryophase.

(c)

	Protista	Fungi					
Mode of nutrition	and Heterotrophic (Photosynthetic) Heterotrophic (Saprophyland Heterotrophic) /Parasitic)						

(4) Plantae

### Solutions (Set-2)

#### **Objective Type Questions**

#### (Kingdom Systems of Classification)

Statement-1 : Linnaeus classified plants into trees, shrubs and herbs, on the basis of morphological 1. characters.

Statement-2 : Aristotle divided animals into group - Anaima and Enaima.

- (1) Only statement-1 is correct
- (2) Only statement-2 is correct
- (3) Both statement-1 and statement-2 are correct
- (4) Both statement-1 and statement-2 are incorrect
- Sol. Answer (2)

Aristotle classified plants into tree, shrubs and herbs

- 2. In members of which kingdom, nuclear membrane is absent?
  - (3) Fungi (1) Monera (2) Protista Plantae
- Sol. Answer (1)

Nuclear membrane is absent in Prokaryotes (Monera)

- 3. In five kingdom classification, the kingdom that includes the blue-green algae, nitrogen-fixing bacteria and methanogenic archaebacteria, is
  - (1) Monera (2) Protista (3) Fungi
- Sol. Answer (1)

Bacteria		Kingdom
Blue-green algae	-	Monera
Nitrogen-fixing bacteria	_	Monera
Methanogenic bacteria	_	Monera

- Which one of the following is not the basis of five kingdom classification? 4.
  - (1) Cell structure
  - (3) Reproduction

(2) Body organisation

(4) Reserve food material

- Sol. Answer (4)

Five kingdom classification is on the basis of

- Cell structure Body organisation
- Reproduction Mode of nutrition
- Phylogenetic analysis

12	Biological Classification		Solutions of A	Assignment (Set-2) (Level-I)
5.	Position of bacteria in the	kingdom system of classifica	ation proposed by Linnaeus	is
	(1) Monera	(2) Protista	(3) Plantae	(4) Animalia
Sol.	Answer (3)			
	Two kingdom classification	n, proposed by Linnaeus kep	t bacteria in Plantae.	
6.	Who was the founder of fi	ve kingdom system of classif	fication?	
	(1) C. Linnaeus	(2) R.H. Whittaker	(3) Aristotle	(4) T.O. Diener
Sol.	Answer (2)			
	R.H. Whittaker proposed f	ive kingdom classification		
7.	According to five kingdom	system, gymnosperms and a	angiosperms are grouped ur	nder the kingdom
	(1) Monera	(2) Protista	(3) Fungi	(4) Plantae
Sol.	Answer (4)			
	Gymnosperm and Angiosp	perm – Kingdom-Plantae		
8	Which organisms are not	included in the five kingdom	system of classification?	~5
0.	(1) Protozoans	(2) Viruses	(3) Lichens	(4) Both (2) & (3)
Sol.	Answer (4)		43	
	Viruses and Lichens are r	not included in the five kingdo	om system.	lun.
0	Who for the first time also	cified exercises on the basi		
9.	(1) Aristotla	(2) Lippoous	(3) Whittakar	(1) Pactour
Sol	Answer (1)			
001.	Aristotle first time classifie	d organisms on the basis of	scientific approach	
10.	Aristotle classified animals not have RBCs is	in two groups on the basis of	of presence or absence of R	BC. The group which does
	(1) Anaima	(2) Enaima	(3) Ovipera	(4) Vivipera
Sol.	Answer (1)			
	Group of animals which ha	ave RBCs – Enaima		
	Group of animals which do	o not have RBCs – Anaima		
11.	Heterotrophic, eukaryotic,	multicellular organisms lacki	ng a cell wall are included i	n the kingdom.
	(1) Protista	(2) Fungi	(3) Plantae	(4) Animalia
Sol.	Answer (4)			
	Animalia includes heterotr	ophic, eukaryotic, multicellul	ar organism lacking a cell w	all

#### (Kingdom : Monera)

12. Match the following

		Column-I		Column-II	
		(Group of bacteria)		(Their shape)	
	a.	Coccus (i	i)	Rod-shaped	
	b.	Bacillus (i	ii)	Spherical	
	c.	Spirillum (i	iii)	) Spiral	
	d.	Vibrium (i	iv)	Comma-shaped	
	(1)	a(i), b(ii), c(iii), d(iv) (2) a(ii), b(i), c(iii	), c	d(iv) (3) a(i), b(ii), c(iv), d(iii) (4) a(ii), b(i), c(iv), d(ii	ii)
Sol.	Ans	swer (2)			
	Co	ccus – Spherical			
	Ba	cillus – Rod shaped			
	Spi	rillum – Spiral			
	Vib	rium – Comma-shaped			
13.	Du	ring favourable conditions bacteria mainly r	ер	produce by	
	(1)	Budding (2) Fragmentatio	n	(3) Sporulation (4) Fission	
Sol.	Ans	swer (4)		danies	
	Re	production in bacteria during favourable co	ndi	dition-fission (mainly)	
14.	Sel	ect the correct statement.		F Service	
	(1)	Cholera, typhoid, tetanus are well-known	dis	liseases caused by viruses	
	(2)	Dinoflagellates, euglenoids and slime more	uld	ds are placed under kingdom Monera	
	(3)	Members of kingdom Protista are primari	ly a	aquatic	
	(4)	Dinoflagellates are the chief 'producers' in	n tł	the oceans	
Sol.	Ans	swer (3)	31	A ANS	
	Ch	olera, Typhoid, Tetanus – Bacterial dise	as	ses	
	Din	oflagellates, Euglenoids & Slime moulds -	- P	Protista	
	Dia	toms are the chief producers in the ocean	۱.		
15.	Sel	ect the incorrect statement.			
	(1)	Nostoc and Anabaena have heterocysts	for	r nitrogen fixation	
	(2)	Cyanobacteria often form blooms in pollu	ted	d water bodies	
	(3)	Heterotrophic bacteria are more abundan	t in	in nature	
	(4)	The cell wall of Mycoplasma are made up	0 0	of chitin	
Sol.	Ans	swer (4)			
	The	e cell wall is absent in <i>Mycoplasma</i> .			

\_\_\_\_\_

14	Biological Classification		Solutions of A	ssigr	iment (Set-2) (Level-I)
16.	Heterocysts present in Anabaena is specialised for				
	(1) Nitrogen fixation (2) Food storage	(3)	Fission	(4)	Sexual reproduction
Sol.	Answer (1)				
	Heterocysts present in Anabaena is specialised for nitro	oger	n fixation		
17.	Mark the odd one w.r.t. cell wall.				
	(1) Halophiles (2) Methanogens	(3)	Thermoacidophiles	(4)	Cyanobacteria
Sol.	Answer (4)				
	Cell wall in Archaebacteria is made up of pseudomurei	n wł	nile in eubacteria it is ma	de u	p of murein.
	Halophiles Methanogens Thermoacidophiles				
	Cyanobacteria $\rightarrow$ Eubacteria				
18.	Primitive bacteria living in salty areas are called as				
	(1) Methanogens (2) Thermoacidophiles	(3)	Heliophytes	(4)	Halophiles
Sol.	Answer (4)			1	
	Archaebacteria living in salty areas—Halophiles.			5	2
(Kin	gdom : Protista)				
19.	Select the non-protistan group.	7	naci	11001	
	(1) Slime moulds (2) Dinoflagellates	(3)	Phycomycetes	(4)	Chrysophytes
Sol.	Answer (3)		Service		
	Slime moulds Dinoflagellates Chrysophytes (diatom) → Protista		SELUcational		
	Phycomycetes $\rightarrow$ Fungi	2	1231		
20.	Which of the following is correct?	or			
	(1) All slime moulds are haploid	(2)	Protozoans lack cell wa	all	
	(3) Dinoflagellates are non-motile	(4)	Pellicle is absent in Eu	glena	a
Sol.	Answer (2)				
	Slime moulds are haploid and diploid				
	Dinoflagellates are motile				
	Pellicle is present in <i>Euglena</i>				
21.	Which is not a feature of dinoflagellates?				
	(1) They cause red tides				
	(2) Their cell wall has stiff cellulose plates on the outer	r sur	face		
	(3) They release toxins				
	(4) These are mostly fresh water and non-photosynthe	tic			

Sol.	Answer (4)						
	Features of dinoflagellates.						
	Cell wall has stiff cellulose plates on the outer surface						
	Release toxins						
	Causes red tides						
	Mostly marine and photosynthetic						
22.	are saprophytic protists, whose body moves along decaying twigs and leaves engulfing organic						
	material.						
	(1) Euglenoids (2) Dinoflagellates (3) Chrysophytes (4) Slime moulds						
Sol.	Answer (4)						
	Slime moulds are saprophytic protists						
23.	Being photosynthetic, which organism in absence of sunlight behave like heterotrophs?						
	(1) Slime moulds (2) Euglenoids (3) Sporozoans (4) Ciliated protozoans						
Sol.	Answer (2)						
	In presence of light – Photosynthetic In absence of light – Heterotrophic						
24.	Diatomaceous earth is formed due to which substance?						
	(1) Phosphorus (2) Calcium (3) Silicon (4) Copper						
Sol.	Answer (3)						
	Diatomaceous earth – Silicon						
(Kin	gdom Fungi, Kingdom Plantae, Kingdom Animalia)						
25.	With respect to fungal sexual cycle, choose the correct sequence of events.						
	(1) Karyogamy, plasmogamy and meiosis (2) Meiosis, plasmogamy and karyogamy						
	(3) Plasmogamy, karyogamy and meiosis (4) Meiosis, karyogamy and plasmogamy						
Sol.	Answer (3)						
	Sexual reproduction in fungi has three stages						
	(a) Plasmogamy : Fusion of protoplasm of male and female gametes.						
	(b) Karyogamy : Fusion of nuclei = Diploid = Zygote						
	(c) Meiosis : Reductional division						
26.	Mark the odd one w.r.t. kingdom fungi.						
	(1) They reproduce asexually and sexually						
	(2) They show a great diversity in structure and habitat						
	(3) Most of fungi are saprophytic in their mode of nutrition						
	(4) They do not reproduce by zoospores						

Sol.	Answer	(4)
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Fungi

- Reproduce asexually and sexually
- Great diversity in structure and habitat
- Most of fungi are saprophytic.
- Lower fungi reproduces by zoospores
- 27. The sex organs are absent, but plasmogamy is brought about by fusion of two vegetative or somatic cells of different genotypes. It is the feature of
  - (1) Phycomycetes (2) Basidiomycetes (3) Ascomycetes (4) All of these

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Sol. Answer (2)
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Basidiomycetes

- Sex organs absent
- Fusion of two vegetative/somatic cells of different genotypes
- 28. The fungi form fruiting bodies in which \_\_\_\_\_\_ division occurs, leading to formation of \_\_\_\_\_\_ spores.
  - (1) Mitotic, diploid (2) Reduction, haploid (3) Mitotic, haploid (4) Reduction, diploid
- Sol. Answer (2)

Fungi Mitosis	Reproductive body	Meiosis Haploid spores				
( <i>n</i> )	( <i>n</i> + <i>n</i> )					
Somatic cells	Somatic cells	Spores				
( <i>n</i> )	( <i>n</i> + <i>n</i> )	( <i>n</i> )				
Vegetative reproduction by fragmentation is common in						

- (1) Agaricus (2) Saccharomyces (3) Euglena (4) Gonyaulax
- Sol. Answer (1)

29.

Vegetative reproduction by fragmentation is common in fungi.

30. Select the incorrect match.

		Class		Member		
	(1)	Phycomycetes	_	Albugo		
	(2)	Basidiomycetes	_	Claviceps		
	(3)	Ascomycetes	_	Penicillium		
	(4)	Deuteromycetes	_	Trichoderma		
Sol.	Ans	swer (2)				
	Asc	comycetes	_	Claviceps		
31.	Нар	oloid sexual spore pr	oduced	exogenously is		
	(1)	Ascospore	(2)	Basidiospore	(3) Oospore	(4) Zygospore

Sol	Answer (2)			
	Exogenous haploid sexual spore – Basidiospore			
	Endogenous haploid sexual spore – Ascospores			
32.	Coenocytic mycelium is found in			
	(1) Deuteromycetes (2) Phycomycetes (3) Ascomycetes (4) All of these			
Sol	. Answer (2)			
	Coenocytic mycelium – Oomycetes and Zygomycetes			
	Septate mycelium – Deuteromycetes, Ascomycetes and Basidiomycetes			
33.	The members of which group are commonly known as sac fungi?			
	(1) Phycomycetes (2) Deuteromycetes (3) Basidiomycetes (4) Ascomycetes			
Sol. Answer (4)				
	Sac fungi – Ascomycetes			
	Club fungi – Basidiomycetes			
	Imperfect fungi – Deuteromycetes			
	Algal fungi – Oomycetes			
	Conjugated fungi – Zygomycetes			
34.	Identify A, B and C in given diagram.			
	(1) A = Mucor, B = Aspergillus, C = Agaricus (2) A = Mucor, B = Agaricus, C = Aspergillus			
	(3) A = Agaricus, B = Mucor, C = Aspergillus (4) A = Agaricus, B = Aspergillus, C = Mucor			
Sol	Answer (1)			
	Mucor – Zygomycetes			
	Aspergillus – Ascomycetes			
	Agaricus – Basidiomycetes			
35.	Select the incorrect statement.			
	(1) <i>Cuscuta</i> is a parasitic plant			
	(2) Bladderwort and Venus fly trap are examples of insectivorous plants.			
	(3) Plantae includes algae, bryophytes, pteridophytes, gymnosperms and angiosperms			

(4) The mode of nutrition in plants is holozoic

#### Sol. Answer (4)

Cuscuta (Amarbael) is parasitic plant

Bladderwort and Venus fly trap are insectivorous plants

Mode of nutrition in plants is autotrophic.

- 36. In which group of organisms, reserve food is stored in the form of glycogen and fat?
  - (1) Man and Monkey
  - (3) Bladderwort and Cuscuta

(2) Cuscuta and Dog

HINdations

(4) Bladderwort and Venus fly trap

(2) Bacteriophages

(4) Both (1) & (2)

Sol. Answer (1)

Members of kingdom Animalia have reserve food as glycogen and fat.

#### (Viruses, Viroids and Lichens)

- 37. Which of the following statement is incorrect about viruses?
  - (1) Viruses contain either RNA or DNA
  - (2) Viruses do not have their own metabolic system
  - (3) Bacteriophages are usually double stranded DNA viruses
  - (4) TMV contains both RNA and DNA as its genetic material

#### Sol. Answer (4)

TMV contains RNA as its genetic material

- 38. Viruses that infect the bacteria are termed as
  - (1) Cyanophages
  - (3) Mycophages
- Sol. Answer (2)

Bacteriphages - Viruses that infect the bacteria

- 39. Who demonstrated that the extract of the infected plants of tobacco could cause infection in healthy plants?
  - (1) Pasteur (2) M.W. Beijerinek
  - (3) D.J. Ivanowsky (4) W.M. Stanley
- Sol. Answer (2)

M.W. Beijerinek demonstrated that extract of the infected plants of tobacco could cause infection in healthy plants.

- 40. The protein coat called capsid made of small subunits called capsomeres are present in
  - (1) Viruses (2) Bacteria
  - (3) Fungi (4) Gymnosperms
- Sol. Answer (1)

Viruses - Capsid made of small subunits, capsomeres

- 41. Select the incorrect match w.r.t. genetic material.
  - (1) Herpes virus ssDNA
  - (2) Bacteriophage dsDNA
  - (3) TMV ssRNA
  - (4) Influenza virus ssRNA
- Sol. Answer (1)

Herpes virus	-	dsDNA
Bacteriophage	_	dsDNA
TMV	_	ssRNA
Influenza virus	_	ssRNA

42. Identify A, B, C and D parts in this diagram of bacteriophage.



#### 20 Biological Classification

- 43. Select the correct statement.
  - (1) Viroids have double stranded RNA
  - (2) RNA of viroids have high molecular weight than viruses
  - (3) Mumps and Herpes are viral diseases
  - (4) The name virus was given by D.J. Ivanowsky

#### Sol. Answer (3)

- (i) Viroids-infectious RNA particles
- (ii) RNA of viroids have low molecular weight.
- (iii) Name virus was given by Pasteur
- 44. Lichens show symbiotic relationship between
  - (1) Algae and fungi
  - (3) Fungi and bacteriophage
- Sol. Answer (1)

Lichen (Association of algae and fungi)

- 45. Which is correct w.r.t. lichens?
  - (1) Mycobiont is autotrophic component
  - (3) They are good pollution indicators

- (2) Algae and bacteria
- (4) Algae and bacteriophage
- (2) Phycobiont is heterotrophic component
- (4) They do not grow in non-polluted areas

Sol. Answer (3)

Lichens – Good pollution indicators

- 46. The association of fungi with the roots of higher plants is called
  - (1) Lichens (2) Mycorrhiza (3) Slime mould (4) Neurospora

 Sol. Answer (2)

Mycorrhiza - Association of fungi with roots of higher plants