KATTAR NEET 2026

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Biological Classification

Q1 Which is **incorrect** regarding two kingdom classification system?

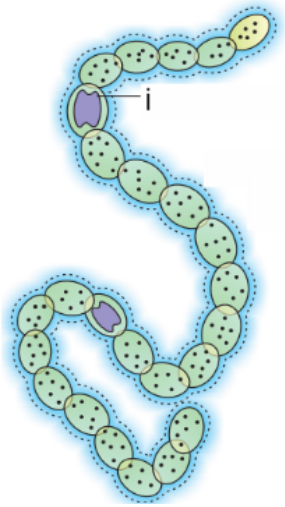
(A) *Paramoecium and Amoeba* were placed with *Chlamydomonas* in Kingdom Plantae.

(B) Fungi and green plants were placed in same kingdom.

(C) *Chlamydomonas and Spirogyra* were placed together under algae.

(D) It brought together the prokaryotic bacteria and cyanobacteria with other groups which were eukaryotic.

Q2 Identify the **incorrect** statement regarding label "**i**" provided in the diagram.



(A) Found in organisms like *Nostoc and Anabaena*.

(B) It is a specialised cell called heterocyst.

(C) It helps in fixing atmospheric nitrogen.

(D) It is found in all cyanobacteria.

Q3 In which of the following pair of organisms, reproduction through conidia formation is **not** found?

(A) *Penicillium* and Morels

(B) *Colletotrichum* and Truffles

(C) *Ustilago* and *Rhizopus*

(D) *Alternaria* and *Aspergillus*

Q4 How many of the following are sexual spores found in fungi?

Conidia, Sporangiospores, Zoospores, Zygospores, Oospores, Aplanospore, Ascospores and Basidiospores

(A) Five (B) Six

(C) Four (D) Three

Q5 Which of the following plant disease(s) is/are caused by organisms that can pass through a bacteria-proof filter?

(A) Potato spindle tuber

(B) Tobacco mosaic disease

(C) White spots on mustard leaves

(D) Citrus canker

(E) Wheat rust

Choose the **correct** answer from the options given below.

(A) A only

(B) B and D only

(C) C and E only

(D) A and B only

Q6 Which of the following pair of organisms does **not** belong to the same class?

(A) Bracket fungi and puffballs

(B) Morels and truffles

(C) *Mucor* and *Rhizopus*

(D) *Alternaria* and *Albugo*

Q7 Identify the **incorrectly** matched pair.

(A) Chrysophytes - autotrophic - plant-like

(B) Slime mould - saprophytic - fungi-like

(C) Protozoan - heterotrophic - animal-like

(D) Euglenoid - both autotrophic and heterotrophic - bacteria-like

Q8 How many of the following diseases are caused by bacteria?
Cholera, sleeping sickness, mumps, Creutzfeldt–Jacob disease, small pox, herpes and influenza, typhoid, malaria, tetanus
(A) Six (B) Three
(C) Four (D) Seven

Q9 Identify the **incorrect** statement.
(A) *Anabaena* possesses polysaccharides and amino acids in its cell wall.
(B) *Claviceps* and *Ustilago* show an intervening dikaryotic stage in their life cycle.
(C) A large number of members of class in which *Trichoderma* belongs are decomposers of litter.
(D) Members of the class in which fungi that are used extensively in biochemical and genetic work belong possess aseptate and branched mycelium.

Q10 Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R:
Assertion A: Both deuteromycetes and basidiomycetes are called imperfect fungi.
Reason R: Both deuteromycetes and basidiomycetes lack sex organs.
In the light of the above statements, choose the **correct** answer from the options given below:
(A) A is true but R is false.
(B) A is false but R is true.
(C) Both A and R are true and R is the correct explanation of A.
(D) Both A and R are true but R is not the correct explanation of A.

Q11 Read the following statements and identify the **incorrect** ones:
A. Phycobiont component of lichen prepare food for its partner.
B. Mycobiont component of lichen provide shelter and absorb mineral nutrients and water for its partner.
C. Viruses that infect plants generally have single stranded RNA.
D. A virus is a nucleoprotein and the protein is infectious.
E. Bacterial viruses are usually double stranded DNA viruses.
Choose the **correct** answer from the options given below:
(A) B, C and E only
(B) D only
(C) A, B, C and E only
(D) A, B and E only

Q12 Match **List I** with **List II**.

List I		**List II**	
A.	T.O. Diener	I.	Virus crystals consist largely of proteins
B.	W.M. Stanley	II.	Extract of infected plants of tobacco as infectious living fluid Infectious living fluid
C.	Dmitri Ivanowsky	III.	Recognised microbes causing the mosaic disease of tobacco
D.	M.W. Beijerinck	IV.	Infectious agent that is made up of free RNA

Choose the **correct** answer from the options given below:
(A) A-IV, B-II, C-III, D-I
(B) A-IV, B-I, C-III, D-II
(C) A-IV, B-III, C-I, D-II
(D) A-I, B-II, C-III, D-IV

Q13 Match **List I** with **List II**.

List I		**List II**	
A.	*Albugo*	I.	Fungi extensively used in

			biochemical and genetic work
B.	*Neurospora*	II.	Parasitic fungi on mustard
C.	*Ustilago*	III.	Rust fungi
D.	*Puccinia*	IV.	Smut fungi

Choose the **correct** answer from the options given below:
(A) A-III, B-II, C-I, D-IV
(B) A-II, B-III, C-IV, D-I
(C) A-I, B-III, C-II, D-IV
(D) A-II, B-I, C-IV, D-III

Q14 Identify the **correct** statement(s) regarding the Five Kingdom system of classification.
A. Unicellular photosynthetic organisms are present only in Kingdom Monera
B. Organisms that lack a cell wall are found in Kingdom Animalia, and some are also found in Kingdom Protista
C. The main criteria for this classification did not include the mode or type of reproduction
D. Out of the five kingdoms, saprophytic organisms are found in three kingdoms
E. Both autotrophic and heterotrophic modes of nutrition are found in Kingdom Monera and Kingdom Protista
Choose the **correct** answer from the options given below:
(A) A, B, D and E only
(B) C only
(C) B, C and D only
(D) B, D and E only

Q15 Given below are two statements:
Statement I: Ascospores are sexual spores that are produced endogenously in sac like asci (singular ascus). These asci are arranged on the outer surface of different types of fruiting bodies called ascocarps.
Statement II: Plasmogamy and meiosis take place in the basidium producing four basidiospores. The basidiospores are exogenously produced on the basidium.
In the light of the above statements, choose the *most appropriate* answer from the options given below:
(A) Statement I is correct but Statement II is incorrect.
(B) Statement I is incorrect but Statement II is correct.
(C) Both Statement I and Statement II are correct.
(D) Both Statement I and Statement II are incorrect.

Q16 Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R:
Assertion A: Viruses and lichens are not placed under any of the five kingdoms.
Reason R: Viruses are non-cellular organisms, and lichens possess both algal and fungal components.
In the light of the above statements, choose the **correct** answer from the options given below:
(A) A is true but R is false.
(B) A is false but R is true.
(C) Both A and R are true and R is the correct explanation of A.
(D) Both A and R are true but R is not the correct explanation of A.

Q17 Select the **correct** set of organisms that lack cell

List I		**List II**	
A.	Amoeboid protozoans	I.	Actively moving organisms
B.	Flagellated protozoans	II.	Parasitic forms cause diseases such as sleeping sickness
C.	Ciliated protozoans	III.	Marine forms have silica shells on their surface
D.	Sporozoans	IV.	Infectious spore-like stage in their life cycle

Choose the *most appropriate* answer from the options given below:

(A) A-III, B-II, C-I, D-IV
(B) A-II, B-III, C-IV, D-I
(C) A-I, B-III, C-II, D-IV
(D) A-II, B-I, C-IV, D-III

Q18 Identify the **correct** statements about members of Kingdom Monera.
A. Mycoplasma are the smallest living cells known, can survive without oxygen.
B. Some heterotrophic bacteria oxidise various inorganic substances such as nitrates, nitrites and ammonia to obtain energy.
C. Bacteria mainly reproduce through spore formation.
D. Bacteria can reproduce by transferring DNA from one bacterium to the other.
E. Their cell wall is composed of polysaccharide and amino acid.
Choose the *most appropriate* answer from the options given below:
(A) A, C and D only
(B) A, D and E only
(C) A, B, D and E only
(D) B, C and E only

Q19 The **correct** sequence of events occur in sexual reproduction of ascomycetes is:
(A) Meiosis → Karyogamy → Plasmogamy → Dikaryophase
(B) Plasmogamy → Karyogamy → Meiosis → Dikaryophase
(C) Plasmogamy → Dikaryophase → Karyogamy → Meiosis
(D) Plasmogamy → Karyogamy → Dikaryophase → Meiosis

Q20 Select the **correct** set of organisms that lack a cell wall.
(A) *Entamoeba, Gonyaulax* and Diatoms
(B) *Mycoplasma, Euglena* and *Paramoecium*
(C) *Trypanosoma*, *Plasmodium* and *Chlamydomonas*
(D) *Amoeba*, *Nostoc* and *Colletotrichum*

Q21 Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R:
Assertion A: Diatoms are the chief 'producers' in the oceans.
Reason R: Diatom cell walls are embedded with silica and thus the walls are indestructible. Thus, diatoms have left behind large amount of cell wall deposits in their habitat.
In the light of the above statements, choose the **correct** answer from the options given below:
(A) A is true but R is false.
(B) A is false but R is true.
(C) Both A and R are true and R is the correct explanation of A.
(D) Both A and R are true but R is NOT the correct explanation of A.

Q22 Read the following statements (A–E) and select the correct ones:
A. Kingdom Protista has brought together *Chlamydomonas* and *Chlorella* with *Paramoecium* and *Amoeba*.
B. Aristotle used simple morphological characters to classify plants into trees, shrubs and herbs.
C. The three-domain system divides the Kingdom Monera into two domains.
D. Some animals also show a saprophytic mode of nutrition.
E. Cyanobacteria form blooms in polluted water bodies.
Choose the **correct** answer from the options given below:
(A) A, B, and D only
(B) A, B, C, and D only
(C) A, B, C, D and E
(D) C, D and E only

Q23 Select the **incorrect** statements from the following:
A. Fungi and bacteria are cosmopolitan in distribution.
B. T.O. Diener discovered an infectious agent that was smaller than viruses and caused potato

spindle tuber disease.
C. Bacteriophages (viruses that infect the bacteria) are usually single-stranded DNA viruses.
D. Capsomeres of viruses are arranged in helical or polyhedral geometric forms.
E. Leaf rolling and curling, yellowing, vein clearing, dwarfing and stunted growth are common symptoms found in plants infected by viroids.
Choose the **correct** answer from the options given below:
(A) A, B and C only
(B) A, B and D only
(C) C and E only
(D) B and C only

Q24 The criteria used by Whittaker's for classification are:
A. Body organisation
B. Habitat
C. Phylogenetic relationships
D. Mode of nutrition
E. Cell structure
Choose the *most appropriate* answer from the options given below:
(A) A, B and E only
(B) A, D and E only
(C) C, and D only
(D) A, C, D and E only

Q25 Read the following statements regarding methanogens:
A. They are included in the group Archaebacteria
B. They are responsible for the production of methane (biogas) from the dung of cattle.
C. They live in some of the most harsh habitats such as extreme salty areas.
D. They are present in the gut of several ruminant animals.
E. They can survive in low pH and high temperature condition.
Choose the **correct** answer from the options given below:
(A) Only A and B are correct
(B) A, B and D are incorrect
(C) C and E are incorrect
(D) A, B, D and E are correct

Q26 Identify the correct organisms or molecules for given features.
A. A pollution indicator that does not grow in polluted areas.
B. Similar in size to viruses
C. Made up of low molecular weight RNA
D. Take over the machinery of the host cell to replicate themselves.
Choose the **correct** answer from the options given below:
(A) A–Virus, B–Viroids, C–Prions, D–Lichen
(B) A–Viroids, B–Virus, C–Lichen, D–Prions
(C) A–Lichen, B–Prions, C–Viroids, D–Virus
(D) A–Prions, B–Lichen, C–Virus, D–Viroids

Q27 Identify the organisms for given features.
A. Releases toxins that may even kill other marine animals such as fishes.
B. Also known as golden algae.
C. Can show both photosynthetic and heterotrophic mode of nutrition.
D. Possess spores with true walls which are extremely resistant and survive for many years, even under adverse conditions.
E. They have a gullet that opens to the outside, and coordinated ciliary movement directs food-laden water into it.
(A) A–Euglenoids, B–Diatoms, C–Dinoflagellates, D–Slime moulds, E–*Paramoecium*
(B) A–*Gonyaulax*, B–Desmids, C–Euglenoids, D–Slime moulds, E–
(C) A–Desmids, B–Diatoms, C–*Trypanosoma* , D–*Gonyaulax*, E–Euglenoids
(D) A–*Gonyaulax*, B–Diatoms, C–Slime moulds, D–Euglenoids, E–*Trypanosoma*

Q28 A student observed a slide of an organism under the microscope. He noticed that four spore-like structures were exogenously produced on a

structure that was arranged in fruiting bodies. Identify the organism.
(A) *Alternatia*
(B) *Ustilago*
(C) *Mucor*
(D) *Claviceps*

Q29 Identify the fungal classes for the given features or details.
A. Many of them are decomposers of litter and help in mineral cycling.
B. Asexual spores are generally not found.
C. Mostly multicellular but rarely unicellular. They are saprophytic, decomposers, parasitic or coprophilous (growing on dung).
D. They are found in aquatic habitats and on decaying wood in moist and damp places or as obligate parasites on plants.
Choose the **correct** answer from the options given below:
(A) A – Deuteromycetes, B – Basidiomycetes, C – Ascomycetes, D – Phycomycetes
(B) A – Ascomycetes, B – Deuteromycetes, C – Basidiomycetes, D – Phycomycetes
(C) A – Deuteromycetes, B – Ascomycetes, C – Basidiomycetes, D – Phycomycetes
(D) A – Basidiomycetes, B – Phycomycetes, C – Deuteromycetes, D – Ascomycetes

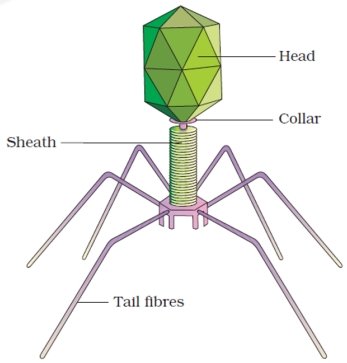
Q30 Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R:
Assertion A: In five kingdom classification protozoans are considered under Kingdom animalia.
Reason R: All protozoans are heterotrophs and live as predators or parasites and are believed to be primitive relatives of animals.
In the light of the above statements, choose the **correct** answer from the options given below:
(A) A is true but R is false.
(B) A is false but R is true.
(C) Both A and R are true and R is the correct explanation of A.
(D) Both A and R are true but R is not the correct explanation of A.

Q31 An organism exhibits a dikaryotic stage in its sexual reproduction and forms fruiting bodies. Which of the following fungi is not expected to exhibit this?
(A) *Agaricus* (B) *Puccinia*
(C) *Rhizopus* (D) *Ustilago*

Q32 Identify the autotrophic organisms among the following.
A. *Euglena*
B. *Gonyaulax*
C. *Plasmodium*
D. Chrysophytes
E. *Cuscuta*
Choose the **correct** option.
(A) A, B and C (B) A, B and D
(C) C, D and E (D) B, D and E

Q33 A non-cellular agent having free RNA but lacking a protein coat;
(A) was discovered by Stanley.
(B) is smaller than virus in size.
(C) has the genetic material of high molecular weight.
(D) could not pass through bacteria-proof filters.

Q34 Choose the **incorrect** statement for the organism shown below.



(A) dsDNA is the genetic material.
(B) It can't reproduce.
(C) It is a bacterial virus.
(D) It is a type of deoxyvirus.

Q35 Identify the incorrectly matched pair.

(A) *Aspergillus* – Ascomycetes
(B) Morel – Ascomycetes
(C) *Alternaria* – Deuteromycetes
(D) Yeast – Deuteromycetes

Q36 Match **List I** with **List II.**

List I		List II	
A.	Indestructible cell wall deposits	I.	Truffle
B.	Used in biochemical work	II.	*Gonyaulax*
C.	Edible heterotroph	III.	Diatoms
D.	Cause red tides in sea	IV.	*Neurospora*

Choose the **correct** answer from the options given below:
(A) A-IV, B-I, C-II, D-III
(B) A-II, B-III, C-IV, D-I
(C) A-III, B-IV, C-I, D-II
(D) A-I, B-III, C-II, D-IV

Q37 An unknown microorganism is discovered. It lacks a cell wall, survives without oxygen, and is pathogenic to plants. Based on Whittaker's classification, it would most appropriately be placed in:
(A) Kingdom Monera
(B) Kingdom Protista
(C) Kingdom Fungi
(D) Kingdom Animalia

Q38 Given below are two statements:
Statement I: The spores of slime moulds possess true walls.
Statement II: Under unfavorable conditions, slime moulds form an aggregation called plasmodium.
In the light of the above statements, choose the **most appropriate** answer from the options given below:
(A) Statement I is correct but Statement II is incorrect.
(B) Statement I is incorrect but Statement II is correct.
(C) Both Statement I and Statement II are correct.
(D) Both Statement I and Statement II are incorrect.

Q39 Given below are two statements: One is labelled as **Assertion (A)** and the other is labelled as **Reason (R):**
Assertion (A): Viruses are obligate parasites.
Reason (R): Viruses can replicate only inside host cells.
In the light of the above statements, choose the **correct** answer from the options given below:
(A) A is true but R is false
(B) A is false but R is true
(C) Both A and R are true and R is the correct explanation of A
(D) Both A and R are true but R is NOT the correct explanation of A

Q40 Arrange the following events of sexual reproduction in fungi in correct sequence.
A. Formation of haploid spores
B. Fusion of protoplasms between two motile or non-motile gametes
C. Formation of zygote
D. Fusion of two nuclei
E. Meiosis in zygote
In the light of above statements choose the **correct** answer from the options given below:
(A) E → B → C → A → D
(B) A → B → C → D → E
(C) B → D → C → E → A
(D) D → A → E → C → B

Q41 The pellicle in euglenoids;
(A) has function similar to cell wall in higher plants.
(B) makes the body flexible.
(C) is rich in carbohydrates.
(D) is made of multiple layers.

Q42 Identify the correct statement.
(A) Oospores are asexual spores in fungi.
(B) Zygospore is a sexual spore in phycomycetes.
(C) Basidiospores are produced inside sex organs.

(D) Ascospores are formed by equational division.

Q43 Match **List I** with **List II.**

List I		List II	
A.	Cell wall has chitin	I.	Monera
B.	Cell lacks true nucleus	II.	Animalia
C.	Holozoic mode of nutrition	III.	Protista
D.	Unicellular members with true nucleus	IV.	Fungi

Choose the **correct** answer from the options given below:

(A) A-IV, B-I, C-II, D-III

(B) A-II, B-III, C-IV, D-I

(C) A-III, B-IV, C-I, D-II

(D) A-I, B-III, C-II, D-IV

Q44 Identify the incorrect statement.

(A) A lichen is a symbiotic association of two different types of organisms.

(B) A mycorrhiza is a symbiotic association of two different types of organisms.

(C) Polysaccharides are present in cell wall of members of kingdom plantae.

(D) Polysaccharides are not present in cell wall of members of kingdom fungi.

Q45 The organisms that fix atmospheric N_2 in heterocysts;

(A) are unicellular algae.

(B) are chemosynthetic autotrophs.

(C) often form blooms in polluted water bodies.

(D) are the most abundant monerans in nature.

Q46 For the three domain system of classification, all the given statements are true, except that;

(A) Kingdom Monera is divided into two domains.

(B) All eukaryotic kingdoms are in the third domain.

(C) It is a six-kingdom classification.

(D) It didn't include archaebacteria.

Q47 Given below are two statements:

Statement I: The mycobiont in lichen is an autotrophic organism.

Statement II: The phycobiont in lichen is a heterotrophic organism.

In the light of the above statements, choose the **most appropriate** answer from the options given below:

(A) Statement I is correct but Statement II is incorrect.

(B) Statement I is incorrect but Statement II is correct.

(C) Both Statement I and Statement II are correct.

(D) Both Statement I and Statement II are incorrect.

Q48 Given below are two statements: One is labelled as **Assertion (A)** and the other is labelled as **Reason (R):**

Assertion (A): Fungi may be parasitic.

Reason (R): The parasitic fungi absorb soluble organic matter from dead substrates.

In the light of the above statements, choose the **correct** answer from the options given below:

(A) A is true but R is false

(B) A is false but R is true

(C) Both A and R are true and R is the correct explanation of A

(D) Both A and R are true but R is NOT the correct explanation of A

Q49 Which of the following are **true** for *Saccharomyces*?

A. Used to make beer

B. Used to make bread

C. Eukaryotic organism

D. Unicellular protist

E. Causes wheat rust

Choose the **correct** option.

(A) B, C and D (B) A, B and C

(C) C, D and E (D) A, C and E

Q50 A unicellular organism floats freely in water, has overlapping silica walls, and is a chief producer in the ocean. If its fossils were found in sediments, which practical use would it likely serve?

(A) Production of antibiotics
(B) Biogas generation
(C) Soil nitrogen enrichment
(D) Filtration and polishing industry

Q51 Match **List I** with **List II.**

List I		List II	
A.	Classified organisms based on simple morphological characters	I.	Aristotle
B.	Two-kingdom classification	II.	Whittaker
C.	Five-kingdom classification	III.	Linnaeus
D.	Named the pathogen that caused tobacco mosaic as virus	IV.	Beijerinck

Choose the **correct** answer from the options given below:
(A) A-IV, B-I, C-II, D-III
(B) A-II, B-III, C-IV, D-I
(C) A-III, B-IV, C-I, D-II
(D) A-I, B-III, C-II, D-IV

Q52 An acellular organism having ssRNA enclosed by a capsid is most likely;
(A) a pathogen of bacteria.
(B) a pathogen of tobacco.
(C) causal organism of mad cow disease.
(D) causal organism of Cr–Jacob disease (CJD) in humans.

Q53 Given below are two statements:
Statement I: The members of kingdom Animalia reproduce mostly by the asexual mode.
Statement II: The life cycle of plants exhibit alternation of generations.
In the light of the above statements, choose the **most appropriate** answer from the options given below:
(A) Statement I is correct but Statement II is incorrect.
(B) Statement I is incorrect but Statement II is correct.
(C) Both Statement I and Statement II are correct.
(D) Both Statement I and Statement II are incorrect.

Q54 A non-living rigid structure that delimits the cell is present in at least some of the members of all the given kingdoms, except;
(A) Monera (B) Plantae
(C) Animalia (D) Protista

Q55 Given below are two statements: One is labelled as **Assertion (A)** and the other is labelled as **Reason (R):**
Assertion (A): Blue-green algae are classified in kingdom Plantae.
Reason (R): Blue-green algae are photosynthetic organisms which have chlorophyll *a* similar to green plants.
In the light of the above statements, choose the **correct** answer from the options given below:
(A) A is true but R is false
(B) A is false but R is true
(C) Both A and R are true and R is the correct explanation of A
(D) Both A and R are true but R is NOT the correct explanation of A

Q56 Which of the following criteria were not used by Whittaker for classification of organisms?
A. Phylogenetic relationships
B. Shape of cell
C. Mode of spore formation
D. Cell structure
E. Mode of reproduction
Choose the **correct** option.
(A) A, D and E (B) B, D and E
(C) A, B and D (D) B and C

Q57 Which of the following is **false** for all members of the Kingdom Monera?
(A) Lack membrane-bound organelles
(B) Lack plasma membrane
(C) Contain genetic material

(D) Have a non-cellulosic cell wall

Q58 Identify the correct statement.

(A) False feet in *Paramoecium* help it in locomotion.

(B) Food enters the gullet in *Amoeba* due to coordinated movement of cilia.

(C) The spore-like stage in sporozoans is non-infectious.

(D) Sleeping-sickness is caused by a parasitic protozoan.

Q59 Given below are two statements:

Statement I: Cholera, typhoid, tetanus, citrus canker are well known diseases caused by same bacterium.

Statement II: Methanogens (true bacteria) produce biogas from cow dung.

In the light of the above statements, choose the **most appropriate** answer from the options given below:

(A) Statement I is correct but Statement II is incorrect.

(B) Statement I is incorrect but Statement II is correct.

(C) Both Statement I and Statement II are correct.

(D) Both Statement I and Statement II are incorrect.

Q60 Match **List I** with **List II.**

	List I		**List II**
A.	Aseptate and coenocytic mycelium	I.	Ascomycetes
B.	Sexual reproduction does not occur	II.	Basidiomycetes
C.	Sexual spores produce endogenously	III.	Phycomycetes
D.	Sexual spores produce exogenously	IV.	Deuteromycetes

Choose the **correct** answer from the options given below:

(A) A-IV, B-I, C-II, D-III

(B) A-II, B-III, C-IV, D-I

(C) A-III, B-IV, C-I, D-II

(D) A-I, B-III, C-II, D-IV

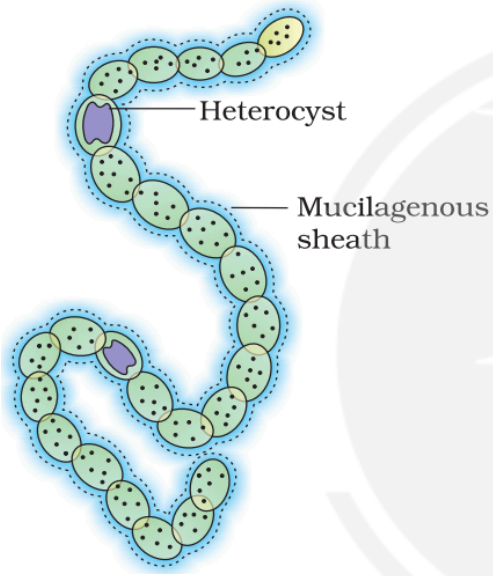
Answer Key

Q1	(A)	Q31	(C)
Q2	(D)	Q32	(B)
Q3	(C)	Q33	(B)
Q4	(C)	Q34	(B)
Q5	(D)	Q35	(D)
Q6	(D)	Q36	(C)
Q7	(D)	Q37	(A)
Q8	(B)	Q38	(A)
Q9	(D)	Q39	(C)
Q10	(B)	Q40	(C)
Q11	(B)	Q41	(B)
Q12	(B)	Q42	(B)
Q13	(D)	Q43	(A)
Q14	(D)	Q44	(D)
Q15	(D)	Q45	(C)
Q16	(C)	Q46	(D)
Q17	(A)	Q47	(D)
Q18	(B)	Q48	(A)
Q19	(C)	Q49	(B)
Q20	(B)	Q50	(D)
Q21	(D)	Q51	(D)
Q22	(C)	Q52	(B)
Q23	(C)	Q53	(B)
Q24	(D)	Q54	(C)
Q25	(C)	Q55	(B)
Q26	(C)	Q56	(D)
Q27	(B)	Q57	(B)
Q28	(B)	Q58	(D)
Q29	(A)	Q59	(D)
Q30	(B)	Q60	(C)

Hints & Solutions

Q1 Text Solution:
In the two-kingdom classification, *Paramoecium and Amoeba* were placed in the animal kingdom due to the absence of a cell wall. Due to the presence of a cell wall, *Chlamydomonas and Chlorella* were placed under algae within the plant kingdom.

Q2 Text Solution:
Some of the cyanobacteria can fix atmospheric nitrogen in specialised cells called heterocysts, e.g., *Nostoc and Anabaena.*



Q3 Text Solution:
Conidia are asexual spores produced exogenously on conidiophores typically in Ascomycetes (*Penicillium, Aspergillus*, Morels, Truffles) and Deuteromycetes (*Colletotrichum, Alternaria*). The asexual spores are generally not found in basidiomycetes (*Ustilago*). Conidia formation is not found in phycomycetes.

Q4 Text Solution:
Sexual reproduction in fungi results in the formation of sexual spores like zygospore, ascospore, basidiospore and oospore. Other spores like conidia, sporangiospores, zoospores, and aplanospores are asexual spores.

Q5 Text Solution:
The causative agents of potato spindle tuber and tobacco mosaic disease are viroid and virus respectively. These are smaller than bacteria and can pass through bacteria-proof filters. Citrus canker is caused by bacterium, white spots on mustard by fungi (*Albugo*), and wheat rust by fungi (*Puccinia*). Bacteria and fungi are larger for bacteria-proof filter pores and cannot pass through it.

Q6 Text Solution:
Bracket fungi and puffballs → Basidiomycetes
Morels and truffles → Ascomycetes
Mucor and *Rhizopus* → Phycomycetes
Alternaria → Ascomycetes, but *Albugo* belongs to Phycomycetes

Q7 Text Solution:
Euglenoids are both autotrophic and heterotrophic, but they are not bacteria-like. They are protists that show both plant and animal features.

Q8 Text Solution:
Bacterial diseases include cholera, typhoid, and tetanus. These are caused by different species of pathogenic bacteria and can be treated with antibiotics.
Non-bacterial diseases from the list are caused by other pathogens: sleeping sickness and malaria by protozoans *Trypanosoma* and *Plasmodium* respectively. Mumps, smallpox, herpes, and influenza by viruses, and Creutzfeldt–Jacob disease by prions.

Q9 Text Solution:
Anabaena is the member of Kingdom Monera and their cell wall is made up of polysaccharide and amino acids.
Claviceps and *Ustilago* belong to ascomycetes and basidiomycetes. In fungi ascomycetes and basidiomycetes, an intervening dikaryotic stage (n + n, i.e., two nuclei per cell) occurs; such a

condition is called a dikaryon and the phase is called dikaryophase of fungus.
A large number of deuteromycetes are decomposers of litter and help in mineral cycling. eg. *Trichoderma*
Neurospora, which belongs to Ascomycetes, is used extensively in biochemical and genetic work. Members of Ascomycetes are septate and branched.

Q10 Text Solution:
Deuteromycetes are called imperfect fungi because they lack a sexual reproductive stage. Basidiomycetes lack sex organs but show sexual reproduction, so they are not called imperfect fungi.

Q11 Text Solution:
A virus is a nucleoprotein and the genetic material is infectious.

Q12 Text Solution:
T.O. Diener discovered viroids, which are infectious agents made up of free RNA.
W.M. Stanley crystallized the tobacco mosaic virus and showed that virus crystals consist largely of proteins.
Dmitri Ivanowsky was the first to recognize the microbes causing tobacco mosaic disease.
M.W. Beijerinck coined the term 'virus' and described it as an infectious living fluid.

Q13 Text Solution:
Albugo is a parasitic fungus which causes white spots on mustard. *Neurospora* has been used extensively in biochemical and genetic work. *Ustilago* causes smut disease while *Puccinia* causes rust disease.

Q14 Text Solution:
Unicellular photosynthetic organisms are also found in Protista (e.g., dinoflagellates, diatoms). So, not exclusive to Monera.
The main criteria for classification used by Whittaker include cell structure, body organisation, mode of nutrition, reproduction and phylogenetic relationships.

Q15 Text Solution:
Asci are arranged in different types of fruiting bodies called ascocarps. Karyogamy and meiosis take place in the basidium producing four basidiospores. The basidiospores are exogenously produced on the basidium.

Q16 Text Solution:
In the five-kingdom classification of Whittaker there is no mention of lichens and some acellular organisms like viruses, viroids and prions. Viruses did not find a place in classification since they are not considered truly 'living', if we understand living as those organisms that have a cell structure. The viruses are non-cellular organisms that are characterised by having an inert crystalline structure outside the living cell.

Q17 Text Solution:
Marine forms of the Amoeboid protozoans have silica shells on their surface. *Trypanosoma* is flagellated protozoan that cause sleeping sickness. Ciliated protozoans are aquatic, actively moving organisms because of the presence of thousands of cilia.
Sporozoans includes diverse organisms that have an infectious spore-like stage in their life cycle.

Q18 Text Solution:
Chemosynthetic autotrophic bacteria oxidise various inorganic substances such as nitrates, nitrites and ammonia and use the released energy for their ATP production. Bacteria reproduce mainly by fission.

Q19 Text Solution:
In some fungi the fusion of two haploid cells immediately results in diploid cells (2n). However, in other fungi (ascomycetes and basidiomycetes), an intervening dikaryotic stage (n + n, i.e., two nuclei per cell) occurs; such a condition is called a dikaryon and the phase is called dikaryophase of fungus. Later, the parental nuclei fuse and the cells become diploid. The fungi form fruiting bodies in which reduction division occurs, leading to formation of haploid spores.

Q20 Text Solution:
With cell wall- Diatoms (made of cellulose with silica embedded in it), *Chlamydomonas*, *Nostoc* (cyanobacteria), *Colletotrichum* (Chitin), *Gonyaulax* (cellulose)
Without cell wall - *Euglena, Entamoeba* (present only in cyst stage), *Mycoplasma, Paramoecium, Trypanosoma, Plasmodium* and *Amoeba*

Q21 Text Solution:
Diatoms are photosynthetic and make a major contribution to the organic matter in oceans; thus, they are called the chief producers. Diatoms have left behind large amount of cell wall deposits in their habitat; this accumulation over billions of years is referred to as 'diatomaceous earth'.

Q22 Text Solution:
Kingdom Protista has brought together *Chlamydomonas* and *Chlorella* with *Paramoecium* and *Amoeba*.
Aristotle used simple morphological characters to classify plants into trees, shrubs and herbs.
The three-domain system divides the Kingdom Monera into two domains.
Some animals also show a saprophytic mode of nutrition.
Cyanobacteria form blooms in polluted water bodies.

Q23 Text Solution:
Bacteriophages (viruses that infect the bacteria) are usually double-stranded DNA viruses.
Leaf rolling and curling, yellowing, vein clearing, dwarfing and stunted growth are common symptoms found in plants infected by virus.

Q24 Text Solution:
The main criteria for classification used by R.H. Whittaker include cell structure, body organisation, mode of nutrition, reproduction and phylogenetic relationships.

Q25 Text Solution:
Halophiles live in some of the most harsh habitats such as extreme salty areas.
Thermoacidophiles can survive in low pH and high temperature condition.

Q26 Text Solution:
Lichens are very good pollution indicators – they do not grow in polluted areas.
Prions are abnormally folded protein that are similar in size to viruses.
The RNA of the viroid was of low molecular weight.
Virus takes over the machinery of the host cell to replicate themselves.

Q27 Text Solution:
Toxins released by large numbers of *Gonyaulax* may even kill other marine animals such as fishes.
Desmids are also known as golden algae.
Euglenoids are photosynthetic in the presence of sunlight, when deprived of sunlight they behave like heterotrophs by predating on other smaller organisms.
Slime mould produce spores with true walls which are extremely resistant and survive for many years, even under adverse conditions.
Ciliated flagellates such as *Paramoecium* have a gullet that opens to the outside, and coordinated ciliary movement directs food-laden water into it.

Q28 Text Solution:
In basidiomycetes, plasmogamy is brought about by fusion of two vegetative or somatic cells of different strains or genotypes. The resultant structure is dikaryotic which ultimately gives rise to basidium. Karyogamy and meiosis take place in the basidium producing four basidiospores. The basidiospores are exogenously produced on the basidium (pl.: basidia). The basidia are arranged in fruiting bodies called basidiocarps. *Ustilago* belongs to basidiomycetes.

Q29 Text Solution:
Many of the members of deuteromycetes are decomposers of litter and help in mineral cycling.
In basidiomycetes, asexual spores are generally not found.

Members of ascomycetes are mostly multicellular but rarely unicellular. They are saprophytic, decomposers, parasitic or coprophilous (growing on dung).

Members of phycomycetes are found in aquatic habitats and on decaying wood in moist and damp places or as obligate parasites on plants.

Q30 Text Solution:

In five kingdom classification protozoans are considered under Kingdom Protista. All single-celled eukaryotes are placed under Protista, but the boundaries of this kingdom are not well defined. All protozoans are heterotrophs and live as predators or parasites. They are believed to be primitive relatives of animals.

Q31 Text Solution:

When a fungus reproduces sexually, two haploid hyphae of compatible mating types come together and fuse. In some fungi the fusion of two haploid cells immediately results in diploid cells (2n). However, in other fungi (ascomycetes and basidiomycetes), an intervening dikaryotic stage (n + n, i.e., two nuclei per cell) occurs; such a condition is called a dikaryon and the phase is called dikaryophase of fungus. *Rhizopus* is a phycomycete.

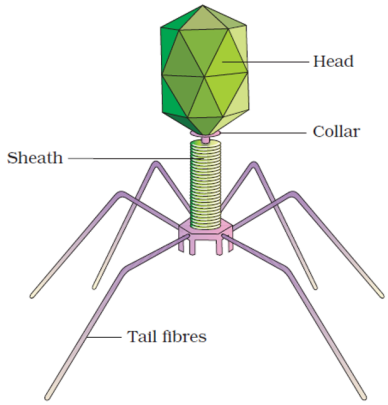
Q32 Text Solution:

Plasmodium is the malarial parasite. *Cuscuta* is a parasitic plant.

Q33 Text Solution:

Viroids : In 1971, T.O. Diener discovered a new infectious agent that was smaller than viruses and caused potato spindle tuber disease. It was found to be a free RNA; it lacked the protein coat that is found in viruses, hence the name viroid. The RNA of the viroid was of low molecular weight.

Q34 Text Solution:



The image represents bacteriophage. Bacterial viruses or bacteriophages (viruses that infect the bacteria) are usually double stranded DNA viruses. DNA containing viruses are called deoxyviruses while RNA-containing viruses are termed as riboviruses. These can reproduce inside suitable host.

Q35 Text Solution:

Yeast is a member of Ascomycetes.

Q36 Text Solution:

The diatoms have left behind large amount of cell wall deposits in their habitat; this accumulation over billions of years is referred to as 'diatomaceous earth'. Very often, red dinoflagellates (Example: *Gonyaulax*) undergo such rapid multiplication that they make the sea appear red (red tides). *Neurospora* is used extensively in biochemical and genetic work. Morels and truffles are edible and are considered delicacies.

Q37 Text Solution:

The Mycoplasma are organisms that completely lack a cell wall. They are the smallest living cells known and can survive without oxygen. Many mycoplasma are pathogenic in animals and plants.

Q38 Text Solution:

Slime moulds are saprophytic protists. The body moves along decaying twigs and leaves engulfing organic material. Under suitable conditions, they form an aggregation called plasmodium which may grow and spread over

several feet. During unfavourable conditions, the plasmodium differentiates and forms fruiting bodies bearing spores at their tips. The spores possess true walls.

Q39 Text Solution:

Viruses are inert outside their specific host cell and are considered living only when inside a host. Once they infect a cell they take over the machinery of the host cell to replicate themselves, killing the host. Viruses are obligate parasites.

Q40 Text Solution:

The sexual cycle in fungi involves the following three steps:

(i) Fusion of protoplasms between two motile or non-motile gametes called plasmogamy.

(ii) Fusion of two nuclei called karyogamy.

(iii) Meiosis in zygote resulting in haploid spores.

Q41 Text Solution:

Instead of a cell wall, euglenoids have a protein rich layer called pellicle which makes their body flexible.

Q42 Text Solution:

Asexual reproduction is by spores called conidia or sporangiospores or zoospores, and sexual reproduction is by oospores, ascospores and basidiospores. In phycomycetes, a zygospore is formed by fusion of two gametes. These gametes are similar in morphology (isogamous) or dissimilar (anisogamous or oogamous). The sex organs are absent, but plasmogamy is brought about by fusion of two vegetative or somatic cells of different strains or genotypes. In basidiomycetes, the resultant structure is dikaryotic which ultimately gives rise to basidium. Karyogamy and meiosis take place in the basidium producing four basidiospores. Ascospores are formed by meiosis in ascus mother cells present in asci.

Q43 Text Solution:

Characteristics of the Five Kingdoms

Characters	Five Kingdoms				
	Monera	Protista	Fungi	Plantae	Animalia
Cell type	Prokaryotic	Eukaryotic	Eukaryotic	Eukaryotic	Eukaryotic
Cell wall	Noncellulosic (Polysaccharide + amino acid)	Present in some	Present 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 (saprophytic/parasitic)	Autotrophic (Photosynthetic) and Heterotrophic	Heterotrophic (Saprophytic/ Parasitic)	Autotrophic (Photosynthetic)	Heterotrophic (Holozoic/ Saprophytic etc.)

Q44 Text Solution:

The cell walls of fungi are composed of chitin and polysaccharides. Most fungi are heterotrophic and absorb soluble organic matter from dead substrates and hence are called saprophytes. Those that depend on living plants and animals are called parasites. They can also live as symbionts – in association with algae as lichens and with roots of higher plants as mycorrhiza. Plant cell walls are made up of polysaccharides (cellulose).

Q45 Text Solution:

The cyanobacteria (also referred to as blue-green algae) have chlorophyll *a* similar to green plants and are photosynthetic autotrophs. The cyanobacteria are unicellular, colonial or filamentous, freshwater/marine or terrestrial algae. The colonies are generally surrounded by gelatinous sheath. They often form blooms in polluted water bodies. Some of these organisms can fix atmospheric nitrogen in specialised cells called heterocysts, e.g., *Nostoc* and *Anabaena*. Heterotrophic bacteria are most abundant in nature.

Q46 Text Solution:

The three-domain system has also been proposed that divides the Kingdom Monera into two domains (ie. archaebacteria and eubacteria), leaving the remaining eukaryotic kingdoms in the third domain and thereby a six kingdom classification.

Q47 Text Solution:

Lichens are symbiotic associations i.e. mutually useful associations, between algae and fungi. The

algal component is known as phycobiont and fungal component as mycobiont, which are autotrophic and heterotrophic, respectively.

Q48 Text Solution:

Most fungi are heterotrophic and absorb soluble organic matter from dead substrates and hence are called saprophytes. Those that depend on living plants and animals are called parasites.

Q49 Text Solution:

Commonly known as sac-fungi, the ascomycetes are mostly multicellular, e.g., *Penicillium*, or rarely unicellular, e.g., yeast (*Saccharomyces*). Yeast is used to make bread and beer. Fungi are eukaryotic organisms. Wheat rust is caused by *Puccinia*.

Q50 Text Solution:

In diatoms the cell walls form two thin overlapping shells, which fit together as in a soap box. The walls are embedded with silica and thus the walls are indestructible. Thus, diatoms have left behind large amount of cell wall deposits in their habitat; this accumulation over billions of years is referred to as 'diatomaceous earth'. Being gritty this soil is used in polishing, filtration of oils and syrups. Diatoms are the chief 'producers' in the oceans.

Q51 Text Solution:

Biological classification of plants and animals was first proposed by Aristotle on the basis of simple morphological characters. Linnaeus later classified all living organisms into two kingdoms – Plantae and Animalia. Whittaker proposed an elaborate five kingdom classification – Monera, Protista, Fungi, Plantae and Animalia. M.W. Beijerinck (1898) demonstrated that the extract of the infected plants of tobacco could cause infection in healthy plants and named the new pathogen "virus".

Q52 Text Solution:

In general, viruses that infect plants have single stranded RNA and viruses that infect animals have either single or double stranded RNA or double stranded DNA. Bacterial viruses or bacteriophages (viruses that infect the bacteria) are usually double stranded DNA viruses.

Prions: In modern medicine certain infectious neurological diseases were found to be transmitted by an agent consisting of abnormally folded protein. The agent was similar in size to viruses. These agents were called prions. The most notable diseases caused by prions are bovine spongiform encephalopathy (BSE) commonly called mad cow disease in cattle and its analogous variant Cr–Jacob disease (CJD) in humans. Therefore, the description given in the question matches to that of tobacco mosaic virus.

Q53 Text Solution:

The kingdom plantae includes all eukaryotic chlorophyll-containing organisms. Algae, bryophytes, pteridophytes, gymnosperms and angiosperms are included in this group. The life cycle of plants exhibit alternation of generations – gametophytic and sporophytic generations. The heterotrophic eukaryotic, multicellular organisms lacking a cell wall are included in the Kingdom Animalia. The mode of nutrition of these organisms is holozoic. They reproduce mostly by the sexual mode.

Q54 Text Solution:

The members of kingdom animalia have an outer plasma membrane as the delimiting structure of the cell, not the cell wall which is present in in most of the members of other kingdoms.

Q55 Text Solution:

The cyanobacteria (also referred to as blue-green algae) have chlorophyll *a* similar to green plants and are photosynthetic autotrophs. They are classified in kingdom Monera.

Q56 Text Solution:

The main criteria of the five kingdom classification were cell structure, body

organisation, mode of nutrition and reproduction, and phylogenetic relationships.

Q57 Text Solution:

Plasma membrane is present in all living organisms.

Characteristics of the Five Kingdoms

Characters	Five Kingdoms				
	Monera	**Protista**	**Fungi**	**Plantae**	**Animalia**
Cell type	Prokaryotic	Eukaryotic	Eukaryotic	Eukaryotic	Eukaryotic
Cell wall	Noncellulosic (Polysaccharide + amino acid)	Present in some	Present with chitin	Present (cellulose)	Absent
Nuclear membrane	Absent	Present	Present	Present	Present
Body organisation	Cellular	Cellular	Multiceullar/ loose tissue	Tissue/ organ	Tissue/organ/ organ system
Mode of nutrition	Autotrophic (chemosyn-thetic and photosynthetic) and Hetero-trophic (sapro-phytic/para-sitic)	Autotrophic (Photosyn-thetic) and Hetero-trophic	Heterotrophic (Saprophytic/ Parasitic)	Autotrophic (Photosyn-thetic)	Heterotrophic (Holozoic/ Saprophytic etc.)

Q58 Text Solution:

Amoeboid protozoans move and capture their prey by putting out pseudopodia (false feet) as in *Amoeba*.

Flagellated protozoans: The members of this group are either free-living or parasitic. They have flagella. The parasitic forms cause diseases such as sleeping sickness. Example: *Trypanosoma*.

Ciliated protozoans: These are aquatic, actively moving organisms because of the presence of thousands of cilia. They have a cavity (gullet) that opens to the outside of the cell surface. The coordinated movement of rows of cilia causes the water laden with food to be steered into the gullet. Example: *Paramoecium*.

Sporozoans: This includes diverse organisms that have an infectious spore-like stage in their life cycle.

Q59 Text Solution:

Cholera, typhoid, tetanus, citrus canker are well known diseases caused by different bacteria. Methanogens (archaebacteria) are present in the gut 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.

Q60 Text Solution:

The mycelium is aseptate and coenocytic in phycomycetes. In ascomycetes, sexual spores are called ascospores which are produced endogenously in sac like asci. In basidiomycetes, the basidiospores are exogenously produced on the basidium. Deuteromycetes are commonly known as imperfect fungi because only the asexual or vegetative phases of these fungi are known.