NAME OF THE REGION: CHANDIGARH

NAME OF CLASS: XI

SUBJECT: BIOLOGY

INDEX

CHAPTER 1- THE LIVING WORLD

1. Assertion: Living organisms are regarded as closed systems.
Reason: Energy of living organisms can not be lost or gained from external environment.

A. Both Assertion and Reason are true and Reason is a correct explanation for Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation for Assertion

C. Assertion is true and Reason is false

D. Both Assertion and reason are false.

2. Assertion : The species is reproductively isolated natural population.
Reason : Prokaryotes cannot be kept under differents species on the basis of reproductive isolation.

A. Both Assertion and Reason are true and Reason is a correct explanation for Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation for Assertion

C. Assertion is true and Reason is false

D. Both Assertion and reason are false.

3. Assertion : Chemotaxonomy is classifying organisms at molecular level.
Reason : Cytotaxonomy is classifying organisms at cellular level.

A. Both Assertion and Reason are true and Reason is a correct explanation for Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation for Assertion

C. Assertion is true and Reason is false

D. Both Assertion and reason are false.

4. Assertion: Bacteria, Protista do not have circulatory system.
Reason: These organisms live in moist and watery environment.

A. Both Assertion and Reason are true and Reason is a correct explanation for Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation for Assertion

C. Assertion is true and Reason is false

D. Both Assertion and reason are false.

5. Assertion : Study of internal structure is called anatomy.
Reason : It is useful for phylogentic study

A. Both Assertion and Reason are true and Reason is a correct explanation for Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation for Assertion

C. Assertion is true and Reason is false

D. Both Assertion and reason are false.

6. Assertion : The science of classifiying organisms is called taxonomy.
Reason : Systematics and taxonomy have same meaning.

A. Both Assertion and Reason are true and Reason is a correct explanation for Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation for Assertion

C. Assertion is true and Reason is false

D. Both Assertion and reason are false.

7. Assertion: The growth in living organisms is from inside.
Reason : Plants grow only upto certain age.

A. Both Assertion and Reason are true and Reason is a correct explanation for Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation for Assertion

C. Assertion is true and Reason is false

D. Both Assertion and reason are false.

8. Assertion: Species constitute a group of individuals with fundamental similarities.

Reason: *Indica, leo, tuberosum* represent such group of individuals.

A. Both Assertion and Reason are true and Reason is a correct explanation for Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation for Assertion

C. Assertion is true and Reason is false

D. Both Assertion and reason are false.

9. Assertion: Consciousness and response to stimuli can be considered as defining property of living organism.
Reason: The external environmental stimuli can be physical, chemical or biological.

A. Both Assertion and Reason are true and Reason is a correct explanation for Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation for Assertion

C. Assertion is true and Reason is false

D. Both Assertion and reason are false.

10. Assertion: In fungi, vegetative reproduction occurs by fragmentation and budding.
Reason: Asexual reproduction in fungi, occurs through formation of asexual spores.

A. Both Assertion and Reason are true and Reason is a correct explanation for Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation for Assertion

C. Assertion is true and Reason is false

D. Both Assertion and reason are false.

11. Assertion : Study of biology requires basic knowledge of chemistry and physics.
Reason : Living organisms are made up of atoms and molecules which follow chemical and physical laws.

A. Both Assertion and Reason are true and Reason is a correct explanation for Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation for Assertion

C. Assertion is true and Reason is false

D. Both Assertion and reason are false.

12. Assertion: Binomial nomenclature is system of providing name with two words.
Reason: Each name consists first of a specific name and second of a generic name.

A. Both Assertion and Reason are true and Reason is a correct explanation for Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation for Assertion

C. Assertion is true and Reason is false

D. Both Assertion and reason are false.

13. Assertion: A living organism is unexceptionally differentiated from a non living structure in the basis of responsiveness.
Reason: Response to stimuli is a defining property of living organism.

A. Both Assertion and Reason are true and Reason is a correct explanation for Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation for Assertion

C. Assertion is true and Reason is false

D. Both Assertion and reason are false.

14. Assertion: Classification is necessary to study all living organisms.
Reason: Individuals are grouped into categories in classification.

A. Both Assertion and Reason are true and Reason is a correct explanation for Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation for Assertion

C. Assertion is true and Reason is false

D. Both Assertion and reason are false.

15. Assertion: Living organisms are self replicating, evolving and self regulating unit.
Reason: These are capable of responding to external stimuli.

A. Both Assertion and Reason are true and Reason is a correct explanation for Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation for Assertion

C. Assertion is true and Reason is false

D. Both Assertion and reason are false.

16. The process to standardize the naming of living organisms is called nomenclature. Obviously, the nomenclature is only possible when the organism is described correctly and we know to what organism the name is attached to . this is identification. The system of providing scientific name with two components is called Binomial Nomenclature. The scientific name ensures that each organism is identified by only one name all across the world. They also ensures that such a name has not been used for any other known organism. Scientific names for plants are provided in ICBN and for animals, in ICZN.
(I). Who proposed binomial nomenclature?

A. Carolus Linnaeus

B. Charles Darwin

C. Francis crick

D. Albert Einstein

(II). Which of the following is an example of binomial scientific name?

A. Green algae

B. *Rana tigrina*

C. Snow leopard

D. China rose

(III). In binomial nomenclature, the name of organism consists of

A. kingdom

B. genus

C. species

D. Both B and C

(IV). ICBN stands for

A. Internal botanical congress names

B. International center of botanical names

C. International code of botanical nomenclature

D. Internal code of botanical nomenclature

(V). In binomial nomenclature, ---------- epithet starts with small letter

A. Genus

B. Species

C. Both A and B

D. None of the above

17. All living organisms grow. Increase in mass and increase in number are twin characteristic of growth. Multicellular organisms grow by cell division. In plants, growth occurs continuously throughout their life span. Non living organisms also grow if we take increase in body mass as criterian for growth. However, this kind of growth exhibited by non living objects is by accumulation of the material on surface. Growth, therefore cannot be taken as defining property of living organisms

(I). What are the twin characteristics of growth?

(a) increase in mass

(b) increase in number

(c) both a and b

(d) none of the above

(II). Growth in living organisms is from

(a) outside

(b) inside

(c) both a and b

(d) none of the above

(III). Growth cannot be taken as a defining property or feature of living organisms because

(a) all living organisms do not show growth

(b) non living things grow from inside

(c) non living things also grow

(d) some living organisms do not show the process of reproduction

(IV). Growth is synonymous with reproduction for which of the following organisms?

(a) unicellular algae

(b) amoeba

(c) bacteria

(d) all of the above

(V) Growth and reproduction are mutually exclusive events in which of the following

(a) plants only

(b) animals only

(c) higher animals and plants

(d) lower organisms

18. In multicellular organisms _____refers to the production of progeny possessing features more or less similar to those of parents.

A. growth

B. reproduction

C. metabolism

D. consciousness

19. The sum total of all the chemical reactions occurring in our body is known as

A. metabolism

B. growth

C. regeneration

D. reproduction

20. Cell division occurs _____in plants and _____in animals.

A. continuously, only up to a certain age

B. only up to a certain age, continuously

C. continuously, never

D. once, twice

21. . The scientific name of mango is

a. Mangifera indica

b. Mangifera Indica

c. Mangifera indica

d. Mangifera Indica

22. The order generally ends with

A. ales

B. aceae

C. eae

D. none of these

23. Which of the following are unique features of living organisms?

A. Growth and reproduction

B. Reproduction and ability to sense environment

C. Metabolism and interaction

D. All of the above

24. Which of the following term is used to refer the number of varieties of plants and animals on earth ?

A. Taxonomy

B. Identification

C. Biodiversity

D. Classification

25. Three domains of life are:

A) Archea, Bacteria, Eukarya

B) Plant, Animal, Fungi

C) Aves, Fishe, Mammalia

D) Prokarya, Eukarya, Mammalia

26. Identify the correct match:

A) *Mangifera* - species

B) *Rana* - genus

C) *Sapiens* - genus

D) *Triticum* – species

27. Scientific names of animals are provided in:

A) Red data book

B) ICZN

C) ICBN

D) None of the above

28. Taxon is a

A. unit of classification.

B. species.

C. highest rank of classification.

D. group of closely related organisms.

29. What is the correct sequence of taxa from larger to smaller?

a. Genus-species-order-kingdom

b. Species-order-phylum-kingdom

c. Species-genus-order-phylum

d. Kingdom-phylum-class-order

30. In printed scientific names, only the _____is capitalized.

A. class

B. species

C. genus

D. family

31. Each category of taxonomic hierarchy refers to as a unit of_____.

A. systematic

B. identification

C. nomenclature

D. classification

32. Which of the following statement(s) is/are correct?

A. Only living organisms grow.

B. Plants grow only up to a certain age.

C. The growth in living organisms is from inside.

D. All of the above

33. Which of the following statements regarding nomenclature is correct?

A. Generic name always begins with capital letter whereas specific name with small letter.

B. Scientific name should be printed in italics.

C. Scientific name when handwritten should be underlined.

D. All of the above

34. *Musca domestica* is scientific name of
(A) Housefly

(B) Mosquito
(C) Snail
(D) Ant

35. Which of the following statements regarding growth is incorrect?

A. In plants, growth by cell division is seen only up to a certain stage.

B. Growth exhibited by non-living objects is by accumulation of material on the surface.

C. A multicellular organism grows by cell division.

D. Growth in in vitro culture of unicellular organisms can be observed by counting the number of cells.

36. Which of the following statements is incorrect?

A. The scientific name for humans is *Homo sapiens*.

B. Organisms placed in the same genus are least closely related.

C. Moving from species to kingdom, more different species are included in each higher category.

D. Species that are in the same genus share very specific characteristics.

37. Which one of the following statements is correct about biodiversity ?

A. It is the occurrence of varied type of organisms on earth.

B. Each different kind of plant, animal or organism represents a species.

C. The number of species that are known and described range between 1.7–1.8million.

D. All of the above

38. Which of the following statements (i – vi) are correct ?

(i) Growth cannot be taken as a defining property of living organism.

(ii) Dead organism does not grow.

(iii) Reproduction cannot be an all inclusive defining characteristic of living organisms.

(iv) No non-living object is capable of replicating itself.

(v) Metabolism in a test tube is non-living.

(vi) Metabolism is a defining feature of all living organisms.

A. (i) and (iii)

B. All except (v)

C. All except (iii)

D. All of these

39. Which of the following statements are correct?

(i) Genus comprises a group of related species.

(ii) Taxon represents a taxonomic group of individual organisms.

(iii) Family comprises a group of related genera.

(iv) Taxonomic category class includes related orders.

A. (i), (ii), and (iv)

B. (ii) and (iv)

C. (i), (iii) and (iv)

D. (ii), (iii) and (iv)

40. Which of the following statement(s) is/are correct ?

(i) All living organisms have ability to respond the environment stimuli which could be physical, chemical or biological.

(ii) Plants respond to external factors like light, water, temperature, other organisms, pollutants, etc.

(iii) Photoperiod affects the process of reproduction.

(iv) Human being is the only organism who has self-consciousness.

A. Only (i)

B. Both (ii) and (iii)

C. Both (i) and (iv)

D. All of these

41. Which of the following taxonomic categories is being described by the given statements(i-iii) ?

(i) It is the basic unit of classification.

(ii) It is defined as the group of individuals which resemble in their morphological and reproductive characters and interbreed among themselves and produce fertile off springs.

(iii) Human beings belong to the species sapiens which is grouped in the genus Homo.

A. Species

B. Genus

C. Order

D. Family

42. Which of the following does not come under taxon?
(A) Species

(B) Kingdom

(C) Division

(D) Biodiversity

CHAPTER 2- BIOLOGICAL CLASSIFICATION

Directions: In the following questions, a statement of assertion is followed by a statement of reason.
Mark the correct choice as:
(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false.

Q.1. Assertion : Bacteria are prokaryotic**.**
Reason : Bacteria do not possess true nucleus and membrane bound cell organelles

Q.2. Assertion :Two kingdom classification was insufficient**.**
Reason: Majority of organisms failed to fall into either of the categories in two kingdom classification.

Q.3. Assertion : Archaebacteria are able to survive in harsh habitats.
Reason: Archaebacteria survive in extreme conditions due to the presence of peptidoglycan in their cell wall.

Q.4. Assertion : Several ruminant animals contain methanogens within their gut.
Reason: Methanogens help in the production of methane from dung of ruminants.

Q.5. Assertion : Euglena is called as plant animal.
Reason: Pellicle of Euglena is made up of cellulose and not protein.

Q.6. Assertion: Plasmodium causes disease in female Anopheles mosquitoes.
Reason: Female Anopheles mosquitoes feed on plasmodial blood.

Q.7. Assertion: Kingdom-Protista forms a link between monerans and and the other organism like plants, animal and fungi.
Reason: Protist reproduce sexually and asexually by a process involving cell fusion and zygote formation.

Q.8. Assertion: Fungi imperfecti" does not show alternation of generation.
Reason: The diploid phase is present in only zygote.

Q.9. Assertion: Deuteromycetes is known as fungi imperfecti.
Reason: In Deuteromycetes, only the asexual phase is known.

Q.10. Assertion: Morels and Truffles are edible fungi.
Reason: Some Ascocarps are edible.

Q.11. Assertion: Viruses are nucleoproteins and lack cell organelle, etc.
Reason: Viruses are not considered organism.

Q.12. Assertion : TMV is a virus which causes mosaic disease.
Reason : TMV has RNA as genetic material.

Q.13. Assertion: "Contagium Vivum Pasteur Fluidum" was coined by Pasteur.
Reason: Pasteur found that virus infected plant of tobacco can cause infection in healthy plant.

Q.14. Assertion: In lichens, mycobiont and phycobiont are symbiotically associated in algae which is predominant and fungi is a subordinate partner.
Reason: In this symbiotic association, the fungus provides food while the alga protects fungus from unfavourable conditions.

Q.15. Assertion : Symbiosis is furnished by mycorrhiza.
Reason : In mycorrhiza, symbiosis is established between fungus and alga.

Instructions for Q. No. 16 -20

Read the given passage & answer the following Questions:

There are thousands of different eubacteria or 'true bacteria'. They are characterized by the presence of a rigid cell wall, and if motile, a flagellum. 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 specialized cells called heterocysts, e.g., Nostoc and Anabaena. Chemosynthetic autotrophic bacteria oxidise various inorganic substances such as nitrates, nitrites and ammonia and use the released energy for their ATP production. They play a great role in recycling nutrients like nitrogen, phosphorous. iron and Sulphur.

16. Which of the following can be termed as 'Photosynthetic Autotrophs'

(a) All monerans

(b) Chemosynthetic Bacteria

(c) Cyanobacteria

(d) All Eubacteria

17. Blue green algae are characterized by :

(a) They often form blooms in polluted water bodies.

(b) Some of these organisms can fix atmospheric nitrogen

(c) Their colonies are generally surrounded by gelatinous sheath.

(d) All of these

18. Which is incorrect about Heterocysts:

(a) These are specialized cells

(b) These are present in all Cyanobacteria.

(c) Nostoc and Anabaena have Heterocysts.

(d) Organisms having these cells can fix atmospheric nitrogen

19. Green plants are similar to Blue green algae in having:

(a) chlorophyll a

(b) Heterocysts

(c) chlorophyll b

(d) None of these

20. Which of these can be described as 'true Bacteria'.

(a) Cyanobacteria only

(b) Only Chemosynthetic autotrophic bacteria

(c) Bacteria without cell wall.

(d) Eubacteria

Instructions for Q. No. 21-25

Read the given passage & answer the following Questions:

In addition to proteins, viruses also contain genetic material, that could be either RNA or DNA. No virus contains both RNA and DNA. A virus is a nucleoprotein and the genetic material is infectious. 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 . The protein coat called capsid made of small subunits called capsomeres, protects the nucleic acid. These capsomeres are arranged in helical or polyhedral geometric forms. Viruses cause diseases like mumps, small pox, herpes and influenza. AIDS

in humans is also caused by a virus. In plants, the symptoms can be mosaic formation, leaf rolling and curling, yellowing and vein clearing, dwarfing and stunted growth.

21. Viruses are made up of :

(a) Proteins & DNA

(b) Proteins only

(c) Proteins & RNA

(d) Proteins & DNA / RNA

22. Bacteriophages are usually :

(a) Single stranded DNA viruses

(b) Double stranded RNA viruses

(c) Double stranded DNA viruses

(d) Single stranded RNA viruses

23. Which is not a viral disease of humans:

(a) Pneumonia

(b) Herpes

(c) Mumps

(d) Smallpox

24. Select the incorrect statement regarding Capsomeres:

(a) Capsomeres are sub-units of Capsid

(b) Capsomeres are made of peptidoglycans

(c) Capsomeres may be arranged in helix or polyhedron

(d) Capsomeres are made of proteins

25. Which of these is not a symptom of viral infection in crops:

(a) Leaf rolling

(b) Curling of leaf

(c) Decay of roots

(d) Vein clearing

26. Viroids differ from viruses in having;
(a) DNA molecules without a protein coat
(b) RNA molecules with a protein coat
(c) RNA molecules without a protein coat
(d) DNA molecules with a protein coat

27. Which among the following are the smallest living cells, known without a definite cell wall, pathogenic to plants as well as animals and can survive without oxygen?
(a) Pseudomonas
(b) Mycoplasma
(c) Nostoc
(d) Bacillus

28. All eukaryotic unicellular organisms belong to
(a) Monera
(b) Protista
(c) Fungi
(d) Bacteria

29. The five-kingdom classification was proposed by
(a) R.H. Whittaker
(b) C. Linnaeus
(c) A Roxberg
d) Virchow

30. Organisms living in salty areas are called as
(a) methanogens
(b) halophiles
(c) heliophytes
(d) thermoacidophiles

31. Naked cytoplasm, multinucleated and saprophytic are the characteristics of
(a) Monera
(b) Protista
(c) Fungi
(d) Slime molds

32. An association between roots of higher plants and fungi is called
(a) lichen
(b) fern
(c) micorrhiza
(d) BGA

33. A dikaryon is formed when
(a) meiosis is arrested
(b) the two haploid cells do not fuse immediately
(c) cytoplasm does not fuse
(d) None of the above

34. Contagium vivum fluidum was proposed by
(a) D.J. Ivanowsky
(b) M.W. Beijernek
(c) Stanley
(d) Robert Hook

35. Association between mycobiont and phycobiont are found in
(a) mycorrhiza
(b) root
(c) lichens
(d) BGA

36. The difference between virus and viroid is
(a) absence of protein coat in viroid, but present in the virus.
(b) presence of low molecular weight RNA in virus, but absent in viroid
(c) Both (a) and (b)
(d)None of the above

37. With respect to the fungal sexual cycle, choose the correct sequence of events.
(a) Karyogamy, Plasmogamy, and Meiosis
(b) Meiosis, Plasmogamy, and Karyogamy
(c) Plasmogamy, Karyogamy, and Meiosis
(d) Meiosis, Karyogamy, and Plasmogamy

38. Viruses are non-cellular organisms, but replicate themselves once they infect the host cell. To which of the following kingdom do viruses belong?
(a) Monera
(b) Protista
(c) Fungi
(d) None of these

39. Members of Phycomycetes are found in
(i) Aquatic habitats
(ii) On decaying wood
(iii) Moist and damp places
(iv) As obligate parasites on plants
Choose from the following options:
(a) (i) and (iv)
(b) (ii) and (iii)
(c) None of these
(d) All of these

40. Two kingdom classification was given by
(a) Whittaker
(b) Aristotle
(c) Linnaeus
(d) Darwin

41. Cyanobacteria belong to the kingdom
(a) Protista
(b) fungi
(c) Plantae
(d) monera

42. The bacteria that can survive in extreme salty areas are called
(a) archaebacteria
(b) methanogens
(c) eubacteria
(d) halophiles

43. Heterocyst is found in
(a) Nostoc
(b) chrysophytes
(c) slime moulds
(d) dinoflagellates

44. 'Diatoms' the chief producers in the oceans belong to the group
(a) chrysophytes
(b) dinoflagellates
(c) euglenoids
(d) slime moulds

45. Bacteria have been put in the kingdom Monera because they are
(a) unicellular
(b) prokaryotes
(c) microscopic
(d) decomposers

46. Archaebacteria are considered to be ancient bacteria because they are
(a) autotrophs
(b) heterotrophs
(c) able to survive in extreme conditions
(d) unicellular

47. The five-kingdom classification was given by
(a) Linnaeus
(b) Whittaker
(c) Leeuwenhoek
(d) John Ray

48 Euglena belongs to the kingdom
(a) monera
(b) Protista
(c) Plantae
(d) Animalia

49. Ferns are
(a) unicellular prokaryotes
(b) unicellular eukaryotes
(c) multicellular prokaryotes
(d) multicellular eukaryotes

50. The mode of nutrition in Kingdom Fungi is mainly
(a) autotrophic
(b) heterotrophic
(c)saprophytic
(d) parasitic

CHAPTER 3 : PLANT KINGDOM

Directions: In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as:

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.

(d) If both Assertion and Reason are false.

1**. Assertion:** Pinus is monoecious.

Reason: Each sporophyll bears only one microsporangium.

2. Assertion: Archegonium is the female sex organ in bryophytes.

Reason: Algae also possess the archegonium.

3. Assertion: Mosses are of great ecological importance.

Reason: They prevent soil erosion by forming dense mat on the soil.

4. Assertion: Each group of algae show predominance of one pigment.

Reason: The algae are classified on this basis.

5. Assertion: The leaves in gymnosperm are well adapted to withstand extremes of temperature, humidity and wind.

Reason: Unlike bryophytes and pteridophytes, in gymnosperms, the male and female gametophytes do not have an independent free-living existence.

6.Assertion: Chlorella and Spirulina are used as a food supplement by space travellers.

Reason: These are rich in proteins

7. Assertion: Bryophytes and pteridophytes contain well-developed antheridia.

Reason: Biflagellate sperms are formed by their antheridia.

8. Assertion: Liverworts fail to spread to a new locality through fragmentation.

Reason: Gemmae are helpful in propagating liverworts in different locality.

9. Assertion: Sporophytes of pteridophyte are dominant individuals.

Reason: They do not show the formation of true root.

10. Assertion: In Liverworts, both male and female sex organs may be present on same thalli or different thalli.

Reason: A sporophyte is formed from the zygote which is differentiated into foot, seta and capsule.

11. Assertion: Zygote produces a multicellular sporophyte in pteridophytes.

Reason: The dominant phase in life cycle of pteridophytes is sporophyte.

12. Assertion: Selaginella and Salvinia are homosporous.

Reason: In Selaginella and Salvinia, similar kind of spores are produced.

13. Assertion: Bryophytes are claimed to be terrestrial amphibians.

Reason: They require an external layer of water on the soil surface for their existence.

14. Assertion: Plant body is usually grass green in colour in Chlorophyceae.

Reason: Members of Chlorophyceae possess chlorophyll a, c , carotenoids and xanthophyll.

15. Assertion: The male and female gametophytes do not have independent existence in gymnosperms.

Reason: They remain within the sporangia retained on the sporophyte.

CASE BASED QUESTIONS

16.Bryophyta (bryophytes) A division of plants which for some authors includes the mosses (Musci) and liverworts (Hepaticae), but is now often taken to include only the mosses; liverworts having been assigned divisional status as Hepatophyta. Bryophytes differ from algae in that the multicellular gametangium is surrounded by a protective jacket of sterile cells; gametangia of algae are usually unicellular and never have a protective jacket of sterile cells. Although bryophytes lack differentiated water-conducting vessels, and rely largely or entirely on water absorbed from rain falling on the plants, or from a moist atmosphere, some larger species may have simple water-conducting cells. They lack true roots, but possess root-like rhizoids which anchor them to a substrate and which can absorb water and minerals. The plants all show a heteromorphic alternation of generations,

with a green vegetative gametophyte (the familiar moss or liverwort plant) and a sporophyte which typically takes the form of a (usually stalked) capsule and which is partially or wholly parasitic on the gametophyte. Most bryophytes are land plants and are found worldwide in a range of habitats. They are known from Devonian rocks, but there is no evidence to link them with either the green algae or the more advanced pteridophytes.

16(i) A characteristic feature of bryophytes is:

(a) a dominant and parasitic sporophyte

(b) a dominant and spore-producing gametophyte

(c) a small sporophyte phase, which is dependent on the gametophyte

(d) sporophytes stay for a longer duration.

16**(ii)Find the true statement about bryophytes:**

(a) they have chloroplasts

(b) they have archegonia

(c) they are thalloid

(d) all of the above.

16(iii) Among the following which is not characteristics feature of bryophyte:

(a) Motile sperms

(b) Presence of archegonium

(c) Water essential for fertilization

(d) Independent sporophyte

16(iv)Bryophytes differ from pteridophytes in:

(a) Swimming antherozoids

(b) An independent gametophyte

(c) Archegonia

(d) Lack of vascular tissue

16(v)In bryophytes, antherozoids are-

(a)Biflagellate

(b)Multiflagellate

(c) Sometimes biflagellate and sometimes multiflagellate.

(d)Biflagellate in a few species and multiflagellate in the rest.

17.The conifer forests of the world cover huge areas of land and provide the largest terrestrial *carbon sink.* Conifers are also valued economically; their softwood is used for the production of timber, they are used to cultivate pine nuts, and the berries of the juniper bush are used to flavour gin. As in all other vascular plants, gymnosperms have a sporophyte dominant life cycle (the sporophyte is the diploid multicellular stage, which comprises the body of the plant, i.e., a leafy tree). The gametophyte phase is relatively short, and sees gametes produced on the reproductive organs.

17.(i) **For a plant species to be 'dioecious', it must:**

(a) Reproduce asexually

(b) Have both male and female organs

(c) Have separate male and female individuals

(d) Not reproduce

17(ii) Which division of the gymnosperms is most commonly used to create paper?

(a) Conifers

(b) Cycads

(c) Gnetophyta

(d) Gingkophyta

17(iii) **What role does the cone have in the gymnosperm life cycle?**

(a) It is the seed

(b)It is the male gametophyte

(c) It is the reproductive body

(d) It feeds the embryo

17(iv)Conifers are adapted to tolerate extreme environmental conditions because of-

(a) broad hardy leaves.

(b) superficial stomata.

(c) thick cuticle

(d) presence of vessels.

17(v)Cycas and Adiantum resemble each other in having:

(a) seeds

(b) motile sperms

(c) cambium

(d) vessels

18. Fusion of two motile gametes which are dissimilar in size is termed as

(a) Oogamy

(b) Isogamy

(c) Anisogamy

(d) Zoogamy

19. Holdfast, stipe and frond constitute the plant body in case of

(a) Rhodophyceae

(b) Chlorophyceae

(c) Phaeophyceae

(d) All of the above

20. A plant shows thallus level of organization. It shows rhizoids and is haploid. It needs water to complete its life cycle because the male gametes are motile. It may belong to:

(a) Pteridophytes

(b) Gymnosperms

(c) Monocots

(d) Bryophytes

21. A prothallus is:

(a) A structure in pteridophytes formed before the thallus develops

(b) A sporophytic free living structure formed in pteridophytes

(c) A gametophyte free living structure formed in pteridophytes

(d) A primitive structure formed after fertilization in pteridophytes.

22. Plants of this group are diploid and well adapted to extreme conditions. They grow bearing sporophylls in compact structures called cones. The group in reference is:

(a) Monocot

(b) Dicots

(c) Pteridophytes

(d) Gymnosperms

23. Protonema is:

(a) Haploid and is found in mosses

(b) Diploid and is found in liverworts

(c) Diploid and is found in pteridophytes

(d) Haploid and is found in pteridophytes.

24. The giant Redwood tree (Sequoia sempervirens) is a/an .

(a) Angiosperm

(b) Free fern

(c) Pteridophyte

(d) Gymnosperm

25.Most primitive vascular plants?

(a)Mosses

(b)Cycads

(c)Kelps

(d)Ferns

26. Plants that possess spores and embryo but lack vascular tissues and seeds?

(a)Rhodophyta

(b)Bryophyta

(c)Pteridophyta

(d)Phaeophyta

27. **Red colour of red algae is due to:**

(a) chlorophyll a,

(b) xanthophyll

(c) phycoerythrin

(d) phycocyanin

28. Plants reproducing by spores are grouped under:

(a)Bryophytes

(b)Sporophytes

(c)Cryptogams

(d)Thallophytes

29. Plants having vascular tissue without seeds:

(a)Angiosperm

(b)Pteridophytes

(c)Bryophytes

(d)Gymnosperms

30. The plant group that possess the largest ovule, largest gametes, and largest tree:

(a)Angiosperms

(b)Gymnosperms

(c)Pteridophytes

(d)Bryophytes

31. Zygotic meiosis is the characteristic of:

(a)Fucus

(b)Funaria

(c) Marchantia

(d)Chlamydomonas

32. Pick the mismatched pair:

(a)Cycas – Dioecious

(b)Equisetum – Homosporous

(c)Salvinia – Heterosporous

(d)Pinus – Dioecious

33. A colonial alga is:

(a)Volvox

(b)Chlorella

(c)Ulothrix

(d)Spirogyra

34. First plants to inhabit the land:

(a)Angiosperms

(b)Bryophytes

(c)Gymnosperms

(d)Pteridophytes

35. Agar is commercially obtained from:

(a)Blue-green algae

(b)Red algae

(c)Brown algae

(d)Green algae

36. Which one is responsible for the formation of peat?

(a) Riccia

*(b)*Sphagnum

*(c)*Marchantia

*(d)*Funaria

37. Isogamous condition with non-flagellated gametes is found in:

(*a)* Chlamydomonas

(b) Volvox

(c) Spirogyra

(d) Fucus

38. Which is the common characteristic of multicellular fungi, filamentous algae and protonema of mosses?

(a) Mode of nutrition

(b) Diplontic life cycle

(c) Multiplication by fragmentation

(d) Members of Plant Kingdom

39. The transport of male gametes in bryophytes and pteridophytes occurs through:

(a) Wind

(b)Water

(c) Birds

(d)Insects

40. An evolutionary important character of Selaginella is:

(a). Strobili

(b) Rhizophore

(c) Heterosporous nature

(d) Ligule

41. **Red algae resemble blue green algae in having:**

(a)Similar cell wall constituent

(b)Similar food reserve

(c)Similar mode of reproduction

(d)Phycobilin.

42. All algae possess:

(a) chlorophyll b and carotene

(b) chlorophyll a and carotene

(c) chlorophyll a and chlorophyll c (d) chlorophyll a and chlorophyll b

CHAPTER 4- ANIMAL KINGDOM

Assertion Reason Questions

Directions: In the following questions, a statement of assertion is followed by a statement of reason.
Mark the correct choice as:
(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false.

Q.1. Assertion: Radial symmetry in animal helps in detecting food and danger.
Reason: It enables the animal to respond to stimuli from any direction.

Q.2. Assertion: Animals that have an exoskeleton, lacks an endoskeleton.
Reason: Skeleton cells in the embryonic stage migrate to either stage and produce exoskeleton
or endoskeleton but never both.

Q.3. Assertion : Cold blooded animals do not have fat layer.
Reason : Cold blooded animals use their fat for metabolic process during hibernation.

Q.4. Assertion : The skeleton of sponges is made up of spicules.
Reason : Composition of spicules help in classification of sponges.

Q.5. Assertion : Sponges belong to Porifera.
Reason : Sponges have canal system.

Q.6. Assertion : Sponges have body organization of "cellular level".
Reason : There is some physiological division of labour.

Q.7. Assertion: Sponges exhibit cellular level of organization.
Reason: In sponges, cells are arranged as loose cell aggregates.

Q.8. Assertion: Leucosolenia shows ascon type of canal system.
Reason: Water passes through ostia → spongocoel → osculum in Leucosolenia.

Q.9. Assertion: Sponges do not show any animal nature.
Reason: Sponges are sessile having specialized structures for capturing food or eliminating wastes.

Q.10. Assertion: In ctenophores, digestion is chiefly extracellular.
Reason: Digestive tract is incomplete in ctenophores.

Q.11. Assertion: Cnidoblasts are present on the tentacles and the body in cnidarians.
Reason: Cnidoblasts are used for anchorage, defence and capture of the prey.

Q.12. Assertion: Coelenterates are known as Radiata.
Reason: These are bilaterally symmetrical organism.

Q.13. Assertion: Hydra is green in colour.
Reason: Green colour is due to the presence of chlorophyll in their body wall.

Q.14. Assertion: Nerve cells in coelenterata have complete co-ordination in their body.
Reason: True nerve cells occur for the first time in coelenterate.

Q.15. Assertion: Obelia is dimorphic in nature.
Reason: Polyp and gonangia form are exhibited by Obelia.

Case based questions:

1.On a rainy day, Raghav found small brownish worm like animals crawling slowly over the ground of his school. On close examination he found that the animal has faintly segmented body.

a) What is the possible identity of the animal ?
b) Why is it seen only in the rainy season ?
c) Name the phylum to which it belong.
d) Give two characteristic features of this organism.

2. Seeing a bat flying over the roof of her house, Saira asked her father
a) What is this night flying bird ?
b) How does it see during night ?
c) Name the phylum to which it belong.
d) What does it eat and how does it obtain the same ? What would be reply of her father?

Multiple choice questions:

Question 1.
Radula is found in
(a) Pila sp.
(b) Chiton sp.

(c) Lamellidens sp.
(d) Pinctada sp.

Question 2.
Sharks, skates, and rays are also called _____ fishes.
(a) Jawless
(b) Bony
(c) Cartilaginous
(d) Freshwater

Question 3.
Turtles are
(a) Arthropods
(b) Pisces
(c) Reptiles
(d) Molluscs

Question 4.
The clam nervous system is composed of
(a) labial palps
(b) one pair of ganglia
(c) two pairs of ganglia
(d) three pairs of ganglia

Question 5.
Choose the correct pair.
(a) Hippocampus – 3-chambered heart
(b) Rana – 2-chambered heart
(c) Crocodilus – 4-chambered heart
(d) Pavo – 3-chambered heart

Question 6.
Who wrote the book Systema Naturae?
(a) Lamarck
(b) Darwin
(c) Wallace
(d) Linnaeus

Question 7.
Which of the following statement is correct?
(a) Platypus lays eggs

(b) Camels have biconcave RBCs
(c) Whales respire by gills
(d) Bats do not fly

Question 8.
Osteichthyes belongs to
(a) class amphibia
(b) super class pisces
(c) super class tetrapoda
(d) division agnatha

Question 9.
Which one of the following groups of animals is correctly matched with its one characteristic feature without even a single exception?
(a) Mammalia : give birth to young ones
(b) Reptilia : possess 3-chambered heart with one incompletely divided ventricle
(c) Chordata : possess a mouth provided with an upper and a lower jaw
(d) Chondrichthyes : possess cartilaginous endoskeleton

Question 10.
Which one of the following phylum is characterized by absence of true coelom?
(a) Annelida
(b) Mollusca
(c) Echinodermata
(d) Nematoda

Question 11.
Which of the following is a pseudocoelomate?
(a) Platyhelminthes
(b) Aschelminthes
(c) Mollusca
(d) Hemi-chordates

Question 12.
Which kind of symmetry occurs in sea anemone?
(a) Bilateral
(b) Radial
(c) Asymmetry
(d) None of these

Question 13.
Phylum that doesnt have a true coelom is
(a) Platyhelminthes
(b) Annelida
(c) Echinoderms
(d) Arthropoda

Question 14.
Male mosquitoes usually feed on
(a) Garbage
(b) Human blood
(c) Flower sap
(d) All of the above

Question 15.
Bed Bugs contribute to the spread of
(a) Typhoid
(b) Yellow fever
(c) Typhus
(d) Trench fever

Question 16.
Which one of the following is NOT a characteristic of phylum Annelida?
(a) Ventral nerve cord
(b) Closed circulatory system
(c) Segmentation
(d) Pseudocoelom

Question 17.
_____ are devoid of respiratory, excretory and circulatory organs.
(a) Threadworms
(b) Sponges
(c) Tapeworms
(d) Liver fluke

Question 18.
Fluke infections are diseases of the _____ in humans.
(a) Blood
(b) Bile
(c) Digestive tract
(d) Lungs

Question 19.
Water-Vascular system is found in

(a) Sea-anemone
(b) Sea-pen
(c) Sea-cucumber
(d) Sea-horse

Question 20.

Special character of Coelenterates is

(a) polymorphism
(b) nematocytes
(c) flame cells
(d) hermaphroditism

Question 21.

Point out the non-parasite

(a) Tapeworm
(b) Mosquito
(c) Leech
(d) Sea anemone

Question 22.

What is true about all sponges without exception ?

(a) They are all marine
(b) They have flagellated collar cells
(c) They have a mixed skeleton consisting of spicules and spongin fibres
(d) They reproduce only asexually by budding.

Question 23.

In desert grasslands which type of animals are relatively more abundant?

(a) Arboreal
(b) Aquatic
(c) Fussorial
(d) Diurnal

Question 24.

In which of the following animal post anal tail is found?

(a) Earthworm
(b) Lower invertebrate
(c) Scorpion
(d) Cobra

Question 25.

Which one of the following characters is not typical of the class Mammalia?

(a) Thecodont dentition
(b) Alveolar lungs
(c) Ten pairs of cranial nerves
(d) Seven cervical vertebrae

CHAPTER 5- MORPHOLOGY OF FLOWERING PLANTS

Q1. Read the assertion and reason carefully.

Assertion: Root hairs are present on whole root surface.

Reason: Root hairs absorb water.

a. If both the assertion and the reason are true and the reason is a correct explanation of the assertion.
b. If both the assertion and reason are true but the reason is not a correct explanation of the assertion.
c. If the assertion is true but the reason is false.
d. If both the assertion and reason are false.
e. If the assertion is false but reason is true.

Q2. Read the assertion and reason carefully.

Assertion: Adventitious roots develop from any part of the plant.

Reason: In such plants tap root is not developed.

a. If both the assertion and the reason are true and the reason is a correct explanation of the assertion.
b. If both the assertion and reason are true but the reason is not a correct explanation of the assertion.
c. If the assertion is true but the reason is false.
d. If both the assertion and reason are false.
e. If the assertion is false but reason is true.

Q3. Read the assertion and reason carefully.

Assertion: Stems develop from hypocotyl of embryo.

Reason: Internodes bear axillary buds.

a. If both the assertion and the reason are true and the reason is a correct explanation of the assertion.
b. If both the assertion and reason are true but the reason is not a correct explanation of the assertion.
c. If the assertion is true but the reason is false.
d. If both the assertion and reason are false.
e. If the assertion is false but reason is true.

Q4. Read the assertion and reason carefully.

Assertion: Bud may form leaves and flowers.

Reason: Bud is a condensed shoot.

a. If both the assertion and the reason are true and the reason is a correct explanation of the assertion.
b. If both the assertion and reason are true but the reason is not a correct explanation of the assertion.
c. If the assertion is true but the reason is false.
d. If both the assertion and reason are false.
e. If the assertion is false but reason is true.

Q5. Read the assertion and reason carefully.

Assertion: In cymose branching growth of terminal bud stop after some time.

Reason: The growth of the main stem is definite.

a. If both the assertion and the reason are true and the reason is a correct explanation of the assertion.
b. If both the assertion and reason are true but the reason is not a correct explanation of the assertion.
c. If the assertion is true but the reason is false.
d. If both the assertion and reason are false.
e. If the assertion is false but reason is true.

Q6. Read the assertion and reason carefully.

Assertion: Runners are underground stem.

Reason: Runners bear nodes and Internodes.

a. If both the assertion and the reason are true and the reason is a correct explanation of the assertion.
b. If both the assertion and reason are true but the reason is not a correct explanation of the assertion.
c. If the assertion is true but the reason is false.

d. If both the assertion and reason are false.
e. If the assertion is false but reason is true.

Q7. Read the assertion and reason carefully.

Assertion: Sucker is an underground stem.

Reason: Sucker stem never comes above the ground.

a. If both the assertion and the reason are true and the reason is a correct explanation of the assertion.
b. If both the assertion and reason are true but the reason is not a correct explanation of the assertion.
c. If the assertion is true but the reason is false.
d. If both the assertion and reason are false.
e. If the assertion is false but reason is true.

Q8. Read the assertion and reason carefully.

Assertion: Phylloclades are modified leaves.

Reason: Phylloclades reduce transpiration.

a. If both the assertion and the reason are true and the reason is a correct explanation of the assertion.
b. If both the assertion and reason are true but the reason is not a correct explanation of the assertion.
c. If the assertion is true but the reason is false.
d. If both the assertion and reason are false.
e. If the assertion is false but reason is true.

Q9. Read the assertion and reason carefully.

Assertion: Phyllotaxy deals with morphology of leaves.

Reason: Foliage denotes all leaves of a plant.

a. If both the assertion and the reason are true and the reason is a correct explanation of the assertion.

b. If both the assertion and reason are true but the reason is not a correct explanation of the assertion.
c. If the assertion is true but the reason is false.
d. If both the assertion and reason are false.
e. If the assertion is false but reason is true.

Q10. Read the assertion and reason carefully.

Assertion: In spiral phyllotaxy many leaves are present on a node.

Reason: In opposite phyllotaxy two leaves are borne on a node.

a. If both the assertion and the reason are true and the reason is a correct explanation of the assertion.
b. If both the assertion and reason are true but the reason is not a correct explanation of the assertion.
c. If the assertion is true but the reason is false.
d. If both the assertion and reason are false.
e. If the assertion is false but reason is true.

Q11.Read the assertion and reason carefully.

Assertion: A simple leaf has undivided lamina.

Reason: Leaves showing pinnate and palmate venation have various type of incisions.

a. If both the assertion and the reason are true and the reason is a correct explanation of the assertion.
b. If both the assertion and reason are true but the reason is not a correct explanation of the assertion.
c. If the assertion is true but the reason is false.
d. If both the assertion and reason are false.
e. If the assertion is false but reason is true.

Q12.Read the assertion and reason carefully.

Assertion: Prickles of plant have a single role of protection of plant.

Reason: They are superficial in origin.

a. If both the assertion and the reason are true and the reason is a correct explanation of the assertion.

b. If both the assertion and reason are true but the reason is not a correct explanation of the assertion.
c. If the assertion is true but the reason is false.
d. If both the assertion and reason are false.
e. If the assertion is false but reason is true.

Q13.Read the assertion and reason carefully.

Assertion: Leaves of Bryophyllum, Begonia help in vegetative multiplication.

Reason: Leaves of these plants possess adventitious buds.

a. If both the assertion and the reason are true and the reason is a correct explanation of the assertion.
b. If both the assertion and reason are true but the reason is not a correct explanation of the assertion.
c. If the assertion is true but the reason is false.
d. If both the assertion and reason are false.
e. If the assertion is false but reason is true.

Q14.Read the assertion and reason carefully.

Assertion: Actinomorphic flowers show radial symmetry.

Reason: Zygomorphic flowers have bilateral symmetry.

a. If both the assertion and the reason are true and the reason is a correct explanation of the assertion.
b. If both the assertion and reason are true but the reason is not a correct explanation of the assertion.
c. If the assertion is true but the reason is false.
d. If both the assertion and reason are false.
e. If the assertion is false but reason is true.

Q15.Read the assertion and reason carefully.

Assertion: Maize is an albuminous seed.

Reason: Endosperm is completely absorbed by its growing embryo.

a. If both the assertion and the reason are true and the reason is a correct explanation of the assertion.
b. If both the assertion and reason are true but the reason is not a correct explanation of the assertion.
c. If the assertion is true but the reason is false.
d. If both the assertion and reason are false.
e. If the assertion is false but reason is true.

CASE BASED QUESTIONS

Q16. Alex used to go to vegetable market with his grandfather, a retired biology teacher. Grandfather told Alex that brinjal, chillies and tomato belong to the same family of plants and asked him to find out the similarity in these plants. Alex found that it's a large family, commonly called as the ' potato family'. Plants belonging to this family are mostly herbs, shrubs and rarely small trees. Many plants belonging to this family are source of food, spice, medicine, fumigatory, and ornamental.

Answer the following questions:

(I). The name of this family is

a. Solanaceae
b. Fabaceae
c. Liliaceae
d. Brassica ear.

(II). Fruits of this family are known as

a. Berry or capsule
b. Legume
c. Endosperm
d. Cotyledon.

(III). Aestivation in calyx and corolla of this family is

a. Valvate
b. Imbricate
c. Twisted
d. Vexillary.

(IV). Stamens of the flowers belonging to this family are mostly attached with petals.

This condition is known as

a. Epipetalous
b. Epiphyllous
c. Polyandrous
d. Monoadelphous.

(V). Medicinal plants belonging to this family are

a. Belladonna, Ashwagandha
b. Aloe, Asparagus
c. Tobacco, Petunia
d. Muliathi, Spice.

Q17. John was reading a chapter on different parts of a green plant. His mother asked him about the functions of roots. He replied that roots are meant for anchorage and absorbing water and minerals from soil. Then mother showed him carrot, radish and turnip and asked him about the additional functions that the roots perform. John was surprised to find that roots in some plants change their shape and structure and become modified to perform additional functions like support, storage of food and respiration.

Answer the following questions:

(I). Carrot is a

a. Tap root
b. Fibrous root
c. Adventitious root
d. Stilt root.

(II). Hanging structures that support a banyan are

a. Prop
b. Tuber
c. Rhizome
d. Stilt

(III). Supporting structures coming out of the lower nodes of the stems of maize and sugarcane are

a. Stilt
b. Tendrils
c. Runner
d. Prop

(IV). Which function is performed by the modified roots of Asparagus?

a. Storage
b. Support
c. Respiration
d. Transpiration.

(V). Pneumatophores are found in

a. Rhizophora
b. Asparagus
c. Sugarcane
d. Maize.

Q18. Roots developed from parts of the plant other than the radical are called

a. Tap roots
b. Fibrous roots
c. Adventitious roots
d. Nodular roots.

Q19. Venation is a term used to describe the pattern of arrangement of

a. Floral organs
b. Flower in inflorescence
c. Veins and veinlets in a lamina
d. All the above.

Q 20. Endosperm, a product of double fertilisation in angiosperms, is absent in the seeds of

a. Gram
b. Orchids
c. Maize
d. Castor.

Q21. Many pulses of daily use belong to which of the following families

a. Solanaceae
b. Fabaceae
c. Liliaceae
d. Poaceae.

Q22.The placenta is attached to the developing seed near the

a. Testa
b. Hilum
c. Micropyle
d. Chalaza.

Q23. In an inflorescence where flowers are borne laterally in an acropetal succession the position of the youngest floral bud should be

a. Proximal
b. Distal
c. Intercalary
d. Anywhere.

Q24. The mature seeds of plants, such as gram and peas possess no endosperm because

a. These plants are not angiosperms
b. There is no double fertilisation in them
c. Endosperm is not formed in them
d. Endosperm is being used up by the developing embryo during seed development.

Q25. Rearrange the following zones as seen in the roots in vertical section and choose the correct option

A. Root hair zone

B. Zone of meristems

C. Rootcap zone

D. Zone of maturation

E. Zone of elongation.

Options

a. C, B, E, A, D
b. A, B, C, D, E
c. D, E, A, C, B
d. E, D, C, B, A

Q26. Roots that arise from the base of the stem are

a. Fibrous roots
b. Primary roots
c. Prop roots
d. Lateral roots.

Q 27. Sweet potato is a modified

a. Stem
b. Adventitious root
c. Tap root
d. Rhizome.

Q28. Roots play insignificant role in absorption of water in

a. Pea
b. Wheat
c. Sunflower
d. Pistia.

Q 29. Pneumatophores are found in

a. The vegetation which is found in marshy and saline lake
b. The vegetation found in acidic soil
c. Xerophytes
d. Epiphytes.

Q30. In Bougainvillea, thorns are the modifications of

a. Adventitious root
b. Stem
c. Leaf
d. Stipules.

Q31. Which of the following is not a stem modification?

a. Tendrils of cucumber
b. Flattened structures of Opuntia
c. Pitcher of Nepenthes
d. Thorns of citrus.

Q32. Stems modified into flat green organs performing the function of leaves are known as

a. Phylloclades
b. Scales
c. Cladode
d. Phyllodes.

Q33. An example of edible underground stem is

a. Carrot
b. Groundnut
c. Sweet potato
d. Potato.

Q34. Sweet potato is homologous to

a. Potato

b. Colocacia
c. Ginger
d. Turnip.

Q35. Which one of the following is a xerophytic plant in which the stem is modified into the flat green and succulent structure?

a. Opuntia
b. Casuarina
c. Hydrilla
d. Acacia.

Q36. What is the eye of potato?

a. Axillary bud
b. Accessory bud
c. Adventitious bud
d. Apical bud.

Q37. New banana plants develop from

a. Rhizome
b. Sucker
c. Stolen
d. Seed.

Q38. Leaves become modified into spines in

a. Onion
b. Silk cotton
c. Opuntia
d. Peam

Q39. How many plants among China rose, Oscimum, Sunflower, Mustard, Alstonia, Guava, Calotropis and Nerium have opposite phyllotaxy?

a. Three
b. Four
c. Five
d. Two.

Q40. Phyllode is present in

a. Asparagus

b. Euphorbia
c. Australian Acacia
d. Opuntia.

Q41. Whorled, simple leaves with reticulate venation is present in

a. Calotropis
b. Neem
c. China rose
d. Alstonia.

Q42. Inflorescence is racemose in

a. Brinjal
b. Tulip
c. Aloe
d. Soyabean.

Q43. Inflorescence is cymose in

a. Solanum
b. Sesbania
c. Trifolium
d. Brassica.

Q44. Long filamentous threads protruding at the end of a young cob of maize are

a. Hairs
b. Anthers
c. Styles
d. Ovaries.

Q45. Hair found in the inflorescence of Zea mays are the modifications of

a. Styles
b. Stigma
c. Spathe
d. Filaments.

Q46. Hypanthodium is specialised type of

a. Fruit
b. Inflorescence
c. Thalamus

d. Ovary.

Q47. Ray florets have

a. Inferior ovary
b. Superior ovary
c. Hypogynous ovary
d. Half inferior ovary

Q48. The ovary is half inferior in

a. Brinjal
b. Mustard
c. Sunflower
d. Plum

Q49. Placentation in which ovules develop on the inner wall of the ovary or in peripheral part is

a. Free central
b. Basal
c. Axile
d. Parietal.

Q 50. Free-central placentation is found in

a. Dianthus
b. Argemone
c. Brassica
d. Citrus.

CHAPTER 7- STRUCTURAL ORGANISATION IN ANIMALS

Directions: In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as:

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false

1. **Assertion:** Presence of connective tissue inside the brain is essential for conduction of nerve impulse.

   Reason: Connective tissue hold together the nerve cells of brain.

2. **Assertion:** Cell junctions are present in the epithelium and other tissues.

   Reason: Among cell junctions, adhering junctions help to stop substances from leaking across a tissue.

3. **Assertion** : Specialization of cells is advantageous for the organisms.
   Reason : It increases the operational efficiency of an organism.

4. **Assertion:** Neurons protect and support the neuroglial cells.

   Reason: Neuroglial cells make up ninety per cent neural tissue in our body.

5. **Assertion :** The squamous epithelium is made of a single thin layer of flattened cells with irregular boundaries.

   Reason : They are found in walls of blood vessels and air sacs of wings

6. **Assertion:** Thigh muscles can get tired but not the muscles of ventricle of heart.

   Reason: Muscles of thigh are voluntary whereas that of heart are involuntary muscles.

7. **Assertion:** In skeletal muscles, a sheath of tough connective tissue encloses several bundles of muscle fibres.

   Reason: These are involuntary in their action.

8. **Assertion:** Materials cannot be exchanged between epithelial cells.

Reason: Blood vessels are present in epithelial tissue.

9**. Assertion:** Non-striated muscles are said to be voluntary in nature.

Reason: Non-striated muscles can be moved according to will.

10. **Assertion:** Smooth muscles are known as involuntary muscles.
Reason: Smooth muscles are controlled by autonomic nervous system.

11.**Assertion:** Neuroglial cells protect and support the neurons.

Reason: When neuron is suitably stimulated, an electrical disturbance is generated which travels along its cytoplasm.

12. **Assertion:** Muscle cells are also called myofibrils.
Reason: Muscle cells are very thick and elongated.

13. **Assertion :** Intercalated discs are important regions of cardiac muscle cells.

Reason : Intercalated discs function as boosters for muscle contraction waves.

14. **Assertion:** Hardest tissue of the body is bone

Reason: Hardness of the bone is due to the calcification of its matrix.

15. **Assertion:** Connective tissues are most abundant and widely distributed in the body of complex animals.

Reason: Connective tissues link and support other tissues or organs of the body.

Case based Questions

16. Structure of human body is made up of different type of cells .These cells predominantly consist of forms two states of matter solid and Liquid with gaseous state dissolve in its one type of tissue. This all three form of matter in human body form the basis of human body structure. How beautifully nature has already connected Chemistry and Biology.

Many famous players like Sachin Tendulkar ,Raffel Nadal,suffered from muscle and bone detachment problems which also shows the significance of connective tissue for athletes too.

Based on above paragraph answer the following:

1. Name the connective tissue present in liquid form in our body.
2. Which tissue connects bones to muscles is _____
3. The liquid connective tissue contains no-
   a. Fibre
   b. Matrix

c. Cell

d. all the above

4. Areolar tissue connects _____

a. Two Bones

b. Muscle & Bone

c. Muscle & fat tissue

d. muscles and their compounds

5. Tip of the nose and external ears have

a. Areolar tissue

b. Ligament

c. cartilage

d. bone

17**. Muscles and nerve fibers allow a person to move their body and enable the internal organs to function. There are more than 600 muscles in the human body. A kind of elastic tissue makes up each muscle, which consists of thousands, or tens of thousands, of small muscle fibers. Each fiber comprises many tiny strands called fibrils.**

Impulses from nerve cells control the contraction of each muscle fiber. A muscle's strength depends mainly on how many fibers are present.

(i). Major protein constituent of muscle fibre is

(a) Actin

(b) Tropomyosin

(c) Myosin

(d) Calnexin

(ii).Myofibrils show dark and light band in

(a) cardiac muscle

(b) Striped muscle

(c) cardiac muscle and unstriated muscle

(d) cardiac muscle and striped muscle

(iii). Unstriped muscle present in the

(a) Intestinal muscle

(b) Leg muscle

(c) Muscle of fore limb

(d) Heart muscle

(iv). Which of the following muscle gets into fatigue very early

A) Skeletal muscle

B) Smooth muscle

C) Cardiac muscle

D) All the above

(v). The structural and functional unit of the striated muscle fibre is called

A) Sarcolemma

B) Sarcomere

C) Sarcoplasm

D) Myofibril

18 Cuboidal epithelium with brush border of microvilli is found in

a. Lining of intestine
b. Ducts of salivary glands
c. Proximal convoluted tubule of nephron
d. Eustachian tube

19 Goblet cells of alimentary canal are modified from

a. Squamous epithelial cells
b. Columnar epithelial cells
c. Chondrocytes
d. Compound epithelial cells

20 **The characteristic of simple eqithelium is that**

(a) the cells are loosely placed

(b) they are single – layered in thickness

(c) cells are tightly packed with no intercelluar spaces

(d) cells are generally ciliated

21. The ciliated epithelium in our body may be found in

(a) trachea

(b) ureter

(c) bile duct

(d) intestine

22 _____ are blood cells that transport oxygen through the bloodstream

A) Leukocytes

b) Erythrocytes

c) Platelets

d) None of the above…

23 The ciliated epithelial cells are required to move particles ormucus in a specific direction. In humans these cells are mainly present in

a. Bronchiole and fallopian tube
b. Bile duct and bronchiole
c. Fallopian tube and pancreatic duct
d. Eustachian tube and salivary duct

24 Match the cell structure with its characteristics feature.

(A) Tight junctions	(i)Cement neighbouring cells together to Form sheet
(B) Adhering junctions	(ii)Transmit information through chemical another cells
(C) Gap junctions	(iii)Establish a barrier to prevent leakage of fluid across epithelial cells
(D) Synaptic junctions	(iv)Cytoplasmic channel to facilitate communication between adjacent cells

Select correct option from the following

	(A)	(B)	(C)	(D)
a.	(ii)	(iv)	(i)	(iii)
b.	(iv)	(ii)	(i)	(iii)
c.	(iii)	(i)	(iv)	(ii)
d.	(iv)	(iii)	(i)	(ii)

25 Which type of tissue correctly match with its location

	Tissue	**Location**
a.	Transitional epithelium	tip of nose
b.	Cuboidal epithelium	Lining of stomach
c.	Smooth muscle	Wall of intestine
d.	Areolar tissue	Tendons

26. Which of the following is true regarding epithelial tissue?

a) No free surface
b) No intercellular matrix
c) No blood supply
d) No nerve supply

27 On what basis is epithelial tissue categorized?

a. On basis of basis of structural modification
b. On basis of type f matrix
c. On basis of function
d. On basis of voluntary and non voluntary action

28 Which of the following is not a location of simple cuboidal epithelium

a. Ducts of smaller glands
b. Pancreatic ducts
c. Tubular part of nephron
d. d. Germinal epithelium

29. Smooth muscles are :-

a) Involuntary, cylindrical, striated

b) Voluntary, spindle–shaped, uninucleate

c) Involuntary, fusiform, non-striated

d) Voluntary, multinucleate, cylindrical

30 Ligament connects the following:

(a) bone to bone

(b) muscle to muscle

(c) cartilage to muscle

(d) bone to muscle

31 The only connective tissue without fibroblast is

a. Cartilage
b. Bone
c. Blood
d. Areolar connective tissue

32 Dense connective tissue can be found

a. Joining bone to bone
b. Joining bone to muscle
c. In skin
d. All of the above

33 In which tissue cells are enclosed in lacunae

a. Muscular tissue
b. Bone tissue
c. Cartilage
d. Both band c

34 Mast cells are associated with

a. Exocrine gland
b. Endocrine gland
c. Areolar connective tissue
d. Neural tissue

35 Cillia , flagella and microvilli are associated with the

a. Connective tissue
b. Epithelial tissue
c. Nervous tissue
d. Muscular tissue

36 The avascular nature of cartilage is responsible for its

a. Flexibility
b. Slow repair
c. Stability for embryonic endoskeleton
d. Transparent consistency

37 The inability to absorb digested nutrients may be due to damage of which type of epithelium

a. Ciliated columnar
b. Simple columnar
c. Simple squamous

d. Simple cuboidal

38 The most appropriate definition of Neuroglial cells are that they are

a. Neurosensory supporting cells
b. Secretory cells
c. Sensory cells
d. Sensory and supporting cells

39 Which of t he following statemaents are wrong

(i) Leucocytes disintegrate inthe spleen and liver
(ii) RBC,WBC and blood platelets are produced by bone marrow
(iii) Neutrophills bring about destruction and detoxification of toxins of protein origin
(iv) The important function of lymphocytes is to produce antibodies

a. (i) and (ii) b. (i) and (iv)

c (i) and (iii) only d. (ii) and (iii) only

40 Sarcolemma is the outer membrane of ... .

a) Muscle fibre

b) Cartilage

c) Nerve fibre

d) Collagen fib

41 Transitional epithelium is found in ... ...

a) Larynx

b) Vein

c) Kidney

d) Ureter and renal pelvis

42 **In connective tissue sheaths, this is the correct sequence stretching from the outermost to the innermost layer**

(a) epineurium, endoneurium, perineurium

(b) perineurium, epineurium, endoneurium

(c) perineurium, endoneurium, epineurium

(d) epineurium, perineurium, endoneurium

43 A salivary gland that secretes saliva is a _ _ _ _ _ Glandular epithelium.

a. Unicellular cuboidal.

b. Unicellular columnar.

c. Multicellular cuboidal.

d. Multicellular columnar.

44 Specialised connective tissue which stores fat is:

a. Areolar tissue.

b. Adipose tissue.

c. Blood.

d. Bones.

45 Cardiac muscles in the heart contract and relaxes at the same time due to:

a. Tight junctions.

b. Adhering junctions.

c. Gap junctions as intercalated discs.

d. All three.

46 Most abundant and widely distributed tissue in the bodies of complex animals is

a. Epithelium
b. Connective
c. Muscular
d. Neural

47 Pavement epithelium is the name of:

(a) Cuboidal epithelium
(b) Squamous epithelium
(c) Columnar epithelium
(d) Ciliated epithelium

48 **Which one of the following types of cell is involved in making of the inner walls of blood vessels?**

a. Cuboidal epithelium

b. Columnar epithelium

c. Squamous epithelium

d. Stratified epithelium

49 **Choose the correctly matched pair :** …

a) Areolar tissue - Loose connective tissue

b) Cartilage -Loose connective tissue

c) Tendon -Specialized connective tissue

d) Adipose tissue -Dense connective tissue

50 **The membrane covering cartilage is known as-**

(a) periosteum

(b) perichondrium

(c) tunica tercia

(d) peritoneum

CHAPTER 8-CELL : THE UNIT OF LIFE

Directions: In the following questions, a statement of assertion is followed by a statement of reason.
Mark the correct choice as:

Q1. Assertion: The number of cells in a multicellular organism is inversely proportional to size of body.

Reason: All cells of biological world are alive.

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.

(d) If both Assertion and Reason are false.

Q2. Assertion: Smaller cells are usually metabolically active cells.

Reason: Smaller cell nucleocytoplasmic ratio and surface volume ratio is higher.

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.

(d) If both Assertion and Reason are false.

Q3. Assertion: Schleiden and Schwann were the first to observe the cells and to put forward cell theory.

Reason: The cells are always living unit.

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.

(d) If both Assertion and Reason are false.

Q4. Assertion: Prokaryotes have a one envelop system.

Reason: There is not even a single membrane that surrounds the prokaryotic cell.

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.

(d) If both Assertion and Reason are false.

Q5. Assertion: Eukaryotic cells have more DNA than prokaryotic cells.

Reason: Eukaryotes are genetically more complex than prokaryotes.

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.

(d) If both Assertion and Reason are false.

Q6. Assertion: Ribosomes are non-membrane bound organelles found in the prokaryotic cells only.

Reason: These are present only in the cytoplasm.

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.

(d) If both Assertion and Reason are false.

Q7. Assertion: As per Schwann, cell wall is a unique character of the plant cell.

Reason: Body of plants and animals are composed of cells and products of cells.

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.

(d) If both Assertion and Reason are false.

Q8. Assertion: Eukaryotic cells have membrane bound organelles.

Reason: Prokaryotic cells lack membrane bound organelles.

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.

(d) If both Assertion and Reason are false.

Q9. Assertion: Organisms are made up of cells.

Reason: Cells are structural unit of living organisms. A cell keeps its chemical composition steady within its boundary.

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.

(d) If both Assertion and Reason are false.

Q10. Assertion: Mitochondria and chloroplasts are semiautonomous organelles.

Reason: They are formed by division of pre-existing organelles and contain DNA but lack protein synthesising machinery.

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.

(d) If both Assertion and Reason are false.

Q11. Assertion: Centrosome does not form any compartment in a cell.

Reason: Centriole is a non-membranous cell organelle.

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.

(d) If both Assertion and Reason are false.

Q12. Assertion: Chloroplast is a semi-autonomous organelle.

Reason: Ribosomes of chloroplast are smaller than cytoplasmic ribosomes.

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.

(d) If both Assertion and Reason are false.

Q13. Assertion: Lipids are arranged within the cell membrane with the hydrophobic tails towards the inner part.

Reason: This ensures that the non-polar tail of saturated hydrocarbons is protected from the aqueous environment.

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.

(d) If both Assertion and Reason are false.

Q14. Assertion: The endoplasmic reticulum which lacks ribosomes is called smooth endoplasmic reticulum (SER).

Reason: SER is mainly involved in protein synthesis.

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.

(d) If both Assertion and Reason are false.

Q15. Assertion: Plant cells have very large vacuoles.

Reason: In plant cells, vacuoles are full of cell sap.

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.

(d) If both Assertion and Reason are false.

Case based/ source based/passage based/ integrated questions

Directions : Read the passages below and answer questions from 16 to 25.

Cell membrane, also called plasma membrane, thin membrane that surrounds every living cell, delimiting the cell from the environment around it. Enclosed by this cell membrane are the cell's constituents, large, water-soluble, highly charged molecules such as proteins, nucleic acids, carbohydrates, and substances involved in cellular metabolism. Cell membranes are composed primarily of fatty-acid-based lipids and proteins. Membrane lipids are principally of two types, phospholipids and sterols (generally cholesterol). Both types share the defining characteristic of lipids—they dissolve readily in organic solvents—but in addition they both have a region that is attracted to and soluble in water.

Q16. Plasma membrane is made up of

(a) A protein, a lipid and a cellulose layer

(b) Bimolecular lipid layer surrounded by protein layers

(c) A protein layer between two lipid layers

(d) A lipid layer between two protein layers

Q17. Fluid mosaic model of cell was put forward by –

(a) Danielli and Dawson

(b) Singer and Nicolson

(c) Garner and Allard

(d) Watson and Crick

Q18. **Which of the following statements best describes the chemical composition of plasma-membrane?**

(a) Plasma membrane is composed of two layers—one layer of phospholipids and one layer of proteins.

(b) Plasma membrane is composed of equal numbers of phospholipids, proteins, and carbohydrates.

(c) Plasma membrane is bilayers of proteins with associated lipids and carbohydrates.

(d) Plasma membrane is bilayers of phospholipids with associated proteins and carbohydrates.

Q19. Most abundant lipid in the cell membrane is

(a) phospholipids

(b) cerebrosides

(c) glycolipids

(d) None of these

Q20. Cell recognition and adhesion are facilitated by components of plasma membrane. These components are generally

(a) glycolipids and glycoproteins

(b) both lipids and proteins

(c) glycolipids

(d) None of these

Structures of the bacterial ribosome have provided a framework for understanding universal mechanisms of protein synthesis. However, the eukaryotic ribosome is much larger than it is in bacteria, and its activity is fundamentally different in many key ways. All ribosomes are composed of two subunits, both of which are built from RNA and protein. Bacterial ribosomes, for example of *Escherichia coli*, contain a small subunit (SSU) composed of one 16S ribosomal RNA (rRNA) and 21 ribosomal proteins (r-proteins) and a large subunit (LSU) containing 5S and 23S rRNAs and 33 r-proteins. In contrast to their bacterial counterparts, eukaryotic ribosomes are much larger and more complex, containing additional rRNA in the form of so-called expansion segments (ES) as well as many additional r-proteins and r-protein extensions.

Q21. Ribosomes are present in

(a) Eukaryotes only

(b) Eukaryotes and prokaryotes

(c) Prokaryotes only

(d) Eukaryotes, prokaryotes and viruses

Q22. In 70S ribosomes, 'S' stands for

(a) SI unit

(b) Solubility factor

(c) Svedberg unit

(d) all of these

Q23. 80 S ribosomes occur in

a) Eukaryotic cells of animals

b) Eukaryotic cells of animals and plants

c) Both Eukaryotic cells and prokaryotic cells

d) all of these

Q24. Ribosomes are made up of

a) RNA only

b) RNA and proteins

c) RNA, DNA and proteins

d) Nucleic acids, proteins and lipids

Q25. Polysomes are

a) multiple units of ribosomes

b) attachment of many ribosomes to a common mRNA

c) attachment of many mRNA to a common ribosome

d) lysosomal aggregations

MCQs

Q26. Which group of organelles is involved in synthesis of substances needed by cell?

(a) RER, lysosome, vacuole

(b) Ribosome, RER, SER

(c) Lysosome, vacuole, ribosome

(d) None of these

Q27. Which one of the following combinations is mismatched?

(a) Pili - Reproduction

(b) Cell wall - Protective, determines shape, prevents from bursting

(c) Flagella, Pili and Fimbriae - Surface structures of bacterial cell

(d) Glycocalyx - may be capsule or slime layer

Q28. The cell organelle involved in glycosylation of protein is

(a) peroxisome

(b) mitochondria

(c) peroxisome endoplasmic reticulum

(d) ribosome

Q29. The outer layer of vacuole is called

(a) plasma layer

(b) leucoplast

(c) cell wall

(d) tonoplast

Q30. Which of the following cell organelle remains enveloped by a single unit membrane?

(a) Chloroplast

(b) Lysosomes

(c) Mitochondria

(d) Nucleus

Q31. Cell wall shows

(a) complete permeability

(b) semi - permeability

(c) differential permeability

(d) impermeability

Q32. Smooth endoplasmic reticulum is well developed in the cells which synthesize

(a) steroids

(b) carbohydrates

(c) proteins

(d) all of these

Q33. **Which of the following feature is not associated with centrosome?**

(a) Two cylindrical structures

(b) centriole

(c) Lipid bilayer covering

(d) Pericentriolar material

Q34. What is the site of DNA and centriole duplication respectively?

(a) Nucleus, nucleolous

(b) Nucleus, cytoplasm

(c) Cytoplasm, nucleus

(d) Nucleus, nucleus

Q35. Cell wall

(a) present only in plants

(b) Contains minerals like calcium carbonate in certain algae

(c) Helps in cell to cell interaction

(d) All are correct

Q36. **Golgi bodies are involved in**

(a) Modification of proteins

(b) Synthesis of glycolipids

(c) Recycling of broken plasma membrane during endocytosis

(d) All of the above

Q37. In plant cells, peroxisomes are associated with

(a) photorespiration

(b) phototropism

(c) photoperiodism

(d) photosynthesis

Q38. Name of Schleiden and Schwann are associated with

(a) protoplasm as the physical basis of life

(b) cell theory

(c) theory of cell lineage

(d) nucleus functions as control centre of cell

Q39. Membranous bag with hydrolytic enzymes which is used for controlling intracellular digestion of macromolecules is

(a) endoplasmic reticulum

(b) nucleosome

(c) lysosome

(d) phagosome

Q40. Golgi apparatus is absent in

(a) higher plants

(b) yeast

(c) bacteria and blue-green algae

(d) None of the above

Q41. Inner membrane convolutions of a mitochondrion are known as

(a) lamellae

(b) thylakoids

(c) grana

(d) cristae

Q42. Organelles having flattened membrane bound cisternae and lying near the nucleus is

(a) centriole

(b) mitochondrion

(c) Golgi apparatus

(d) nucleolus

Q43. Organelle/organoid involved in genetic engineering is

(a) plasmid

(b) mitochondrion

(c) Golgi apparatus

(d) lomasome

Q44. The prokaryotic flagella possess

(a) unit membrane enclosed fibre

(b) protein membrane enclosed fibre

(c) '9+2' membrane enclosed structure

(d) helically arranged protein molecule

Q45. In chloroplasts, chlorophyll is present in the

(a) outer membrane

(b) inner membrane

(c) thylakoids

(d) stroma

Q46. The main organelle involved in modification and routing of newly synthesized proteins to their destinations is

(a) chloroplast

(b) mitochondria

(c) lysosome

(d) endoplasmic reticulum

Q47. The nucleolus is the site of formation of

(a) ribosomes

(b) spindle fibres

(c) chromosomes

(d) peroxisomes

Q48. Ribosomes were discovered by

(a) Golgi

(b) Porter

(c) de Roberts

(d) Palade

Q49. Protein synthesis in an animal cell occurs

(a) only on the ribosomes present in cytosol

(b) only on ribosomes attached to the nuclear envelope and endoplasmic reticulum

(c) on ribosomes present in the nucleolus as well as in cytoplasm

(d) on ribosomes present in cytoplasm as well as in mitochondria

Q50. Select the wrong statement from the following

(a) both chloroplasts and mitochondria contain an inner and an outer membrane

(b) both chloroplasts and mitochondria have an internal compartment, the thylakoid space bounded by the thylakoid membrane

(c) both chloroplasts and mitochondria contain DNA

(d) the chloroplasts are generally much larger than mitochondria

CHAPTER 9 – BIOMOLECULES

1.**Assertion: The exoskeleton of arthropods is made up of a complex polysaccharide called chitin**

Reason: Plant cell walls are made up of Cellulose

A. If both assertion and reason are true and reason is the correct explanation of assertion
B. If both assertion and reason are true but reason is not the correct explanation of assertions
C. If assertion is true but reason is false
D. If both assertion and reason or false

1. **Assertion: All enzymes are not proteins**
   Reason: RNA molecules that possess catalytic activity are called ribozymes.

A. If both assertion and reason are true and reason is the correct explanation of assertion
B. If both assertion and reason are true but reason is not the correct explanation of assertions
C. If assertion is true but reason is false
D. If both assertion and reason or false

2. **Assertion: Hydrolases are enzymes which catalyze the hydrolysis of ester, peptide, Glycosidic bonds.**
   Reason: Lyases are enzymes catalyzing the linking together of two compounds like joining of C-O, C-N, P-O etc. bonds

A. If both assertion and reason are true and reason is the correct explanation of assertion
B. If both assertion and reason are true but reason is not the correct explanation of assertions
C. If assertion is true but reason is false
D. If both assertion and reason or false

3. **Assertion: Each enzyme has a substrate binding site in its molecule which forms highly reactive enzymes substrate complex.**
   Reason: The enzyme substrate complex is long lived and dissociates into its product and unchanged enzyme.

A. If both assertion and reason are true and reason is the correct explanation of assertion
B. If both assertion and reason are true but reason is not the correct explanation of assertions
C. If assertion is true but reason is false
D. If both assertion and reason or false

4. **Assertion: The living state is an equilibrium steady state to be able to perform work.**
   Reason: Living process is a constant effort to prevent falling into non-equilibrium

A. If both assertion and reason are true and reason is the correct explanation of assertion
B. If both assertion and reason are true but reason is not the correct explanation of assertions
C. If assertion is true but reason is false
D. If both assertion and reason or false

5. **Assertion: A protein is a heteropolymer.**
   Reason: Dietary proteins are a source of non-essential amino acids

A. If both assertion and reason are true and reason is the correct explanation of assertion
B. If both assertion and reason are true but reason is not the correct explanation of assertions
C. If assertion is true but reason is false
D. If both assertion and reason or false

6. **Assertion: The heterocyclic compounds in nucleic acids are the nitrogenous bases.**
   Reason: Adenine and guanine are substituted pyrimidines while uracil, cytosine and thymine are substituted purines.

A. If both assertion and reason are true and reason is the correct explanation of assertion
B. If both assertion and reason are true but reason is not the correct explanation of assertions
C. If assertion is true but reason is false
D. If both assertion and reason or false

7. **Assertion: The protein part of the enzyme is called apoenzyme and the non-protein part of the enzyme is called cofactor.**
   Reason: Zinc is a cofactor for the proteolytic enzyme carboxy peptidase.

A. If both assertion and reason are true and reason is the correct explanation of assertion
B. If both assertion and reason are true but reason is not the correct explanation of assertions
C. If assertion is true but reason is false
D. If both assertion and reason or false

8. **Assertion: Inorganic catalyst work efficiently at high temperature.**
   Reason: Enzymes get damaged at high temperature.

A. If both assertion and reason are true and reason is the correct explanation of assertion
B. If both assertion and reason are true but reason is not the correct explanation of assertions
C. If assertion is true but reason is false
D. If both assertion and reason or false

9. **Assertion: In competitive inhibition inhibitor binds reversibly to the same site that the substrate would normally occupy.**
   Reason: Cyanide kills an animal by inhibiting cytochrome oxidase by non-competitive inhibition.

A. If both assertion and reason are true and reason is the correct explanation of assertion
B. If both assertion and reason are true but reason is not the correct explanation of assertions
C. If assertion is true but reason is false
D. If both assertion and reason or false

10. **Assertion: The bonds attaching second and third phosphates of higher nucleotides are energy bonds**
    Reason: Second and third phosphates of higher nucleotides are attached against forces of repulsion between similarly charged phosphate radicals.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If both assertion and reason are true but reason is not the correct explanation of assertions
C. If assertion is true but reason is false
D. If both assertion and reason or false

11. Assertion: Starch iodine complex gives blue colour but Cellulose does not.
Reason: Starch forms helical secondary structure in which it can hold iodine molecules but Cellulose cannot do so as it does not contain complex helices.

A. If both assertion and reason are true and reason is the correct explanation of assertion
B. If both assertion and reason are true but reason is not the correct explanation of assertions
C. If assertion is true but reason is false
D. If both assertion and reason or false

12. Assertion: Co-factors play a crucial role in catalytic activity of the enzyme.
Reason: Catalytic activity is lost when the cofactor is removed from the enzyme.

A. If both assertion and reason are true and reason is the correct explanation of assertion
B. If both assertion and reason are true but reason is not the correct explanation of assertions
C. If assertion is true but reason is false
D. If both assertion and reason or false

13. Assertion: Prosthetic groups are non-protein organic factors which are firmly attached to the Apoenzymes
Reason: FMN and FAD coenzymes loosely attached to the enzyme.

A. If both assertion and reason are true and reason is the correct explanation of assertion
B. If both assertion and reason are true but reason is not the correct explanation of assertions
C. If assertion is true but reason is false
D. If both assertion and reason or false

14. Assertion: The long protein chain is folded upon itself like a hollow ball giving rise to the tertiary structure.
Reason: Tertiary structure gives a three-dimensional view of a protein.

A. If both assertion and reason are true and reason is the correct explanation of assertion
B. If both assertion and reason are true but reason is not the correct explanation of assertions
C. If assertion is true but reason is false
D. If both assertion and reason or false

15. Polysaccharides or the macro molecules consisting of long chains of sugar. Only carbohydrates they are not sweet and are insoluble in water. The two ends of the polysaccharide chain are called reducing and non-reducing ends. Based upon their monomeric units these are homo polysaccharides or heteropolysaccharides. Depending upon their location polysaccharides play multiple functions in living world few examples of polysaccharides include Cellulose, chitin, inulin etc.

i) All the listed polysaccharides are homopolymers except
A) Starch
B) glycogen

C) Chitin
D) Cellulose

ii) Inulin is a polymer of

A) glucose
B) fructose
C) glucose and sucrose
D) fructose and galactans

iii) Murein is a heteropolysaccharide like

A) araban
B) xylan
C) hyaluronic acid
D) agar

iv) **A polysaccharide found in the exoskeleton of crabs is**

A) Cellulose
B) pectin
C) murine
D) chitin

v) **The right end of the polysaccharide chain is called**

A) reducing end
B) non-reducing end
C) right end
D) none of these

16. Lipids form a heterogeneous group but all are made up of carbon hydrogen and oxygen. These are insoluble in water and soluble in organic solvents like acetone, ether, alcohol etc. The number of oxygen atoms is very small compared to carbon atoms. They need a large amount of oxygen for their oxidation to release energy. They could be simple lipids, compound lipids, and derived lipids. Simple lipids are esters of fatty acid and alcohol. Compound lipids are formed when simple lipids combine with another compounds for example glycolipids, phospholipids and lipoproteins. Derived lipids are of various types and important example being steroids.

i) Lipids mainly consist of

A) Carbon only
B) carbon hydrogen and nitrogen
C) carbon hydrogen and oxygen
D) Hydrogen only

ii) **Among the given options non-polymeric molecule is**

A) Nucleic acids
B) proteins
C) Lipids
D) polysaccharides

iii) An example of unsaturated fatty acid is

A) oleic acid
B) stearic acid
C) Linoleic acid
D) both a and c

iv) **The number of carbon atoms as compared to oxygen atoms in lipids is**

A) same
B) much less
C) much more
D) none of these.

v) **Steroids are an example of**

A) derived lipids
B) conjugated lipids
C) simple lipids
D) lipo proteins

MULTIPLE CHOICE QUESTIONS

17. Two monosaccharides are bound together by

A) alcohol group
B) Glycosidic bond
C) Ketone group
D) Removal of water

18. Unsaturated fatty acids have

A) high melting point
B) one or more double bonds
C) oleic acid
D) Palmitic acid

19. tRNA is found in

A) nucleus
B) Cytoplasm
C) membranes
D) mitochondria

20. The RNA contains a base uracil in place of

A) adenine
B) guanine
C) cytosine
D) thymine

22 Magnesium is important because it is present in

A) chlorophyll
B) cell membranes
C) hemoglobin
D) bones

23 The proteins associated with nucleic acids are

A) albumins
B) globulins
C) histones
D) scleroproteins

24. Glycogen differs from starch in

A) kind of bonds
B) kinds of molecules
C) structure of molecules
D) being present in animals only

25. An amino acid is essential because it is

A) used in metabolic pathways
B) an enzyme
C) must be taken in food
D) being present in all plants

26. Beta pleated structure of a molecule can be seen in the following level of protein

A) primary
B) secondary
C) tertiary
D) quaternary

27. If on one helix of DNA the base is cytosine the other helix could have

A) guanine
B) adenine
C) thymine
D) uracil

28. Activity of an enzyme is least affected by

A) Temperature
B) Concentration of substrate
C) concentration of enzyme
D) original activation energy of the system

29. An organic substance which binds to enzyme & is essential for activity of enzyme is

A) Coenzyme
B) Isoenzyme
C) Holoenzyme
D) Apoenzyme

30. Quaternary structure of proteins have
A) four subunits
B) either alpha or beta forms
C) No relation to protein function
D) Depends on primary structure of individual polypeptides

31. Classes of enzymes contained in lysosome is
A) Lyases
B) Ligases
C) Hydrolases
D) Transferases

32 Transition state structure of substrate formed during an enzyme reaction is
A) Permanent and stable
B) Transient and stable
C) Permanent and unstable
D) Transient and unstable

33 Proteins which help other proteins to fold properly are called
A) Chaperones
B) Actins
C) Porins
D) synthases

34 Sulphur containing amino acid is
A) Cysteine
B) Isoleucine
C) Leucine
D) Lysine

35 Benedict test is conducted to confirm presence of
A) Polysaccharide
B) Reducing sugar
C) Lipid
D) Protein

36 An essential fatty acid is
A) Palmitic acid
B) Arachidonic acid
C) Stearic acid
D) Arachidic acid

37 When we homogenize any tissue in an acid, the acid soluble pool represents
A) Cytoplasm
B) Cell membrane
C) Nucleus
D) Mitochondria

38. A pure protein will normally have
A) two ends
B) one end
C) three ends
D) no ends

39 Glycogen is a homopolymers made of
A) glucose units
B) galactose units
C) ribose units
D) amino acids

40 The most abundant chemical in living organisms could be
A) Protein
B) Water
C) Sugars
D) Nucleic acids

41 One of the elements not found in living organisms either free or in form of compounds is
A) Magnesium
B) Sodium
C) Iron
D) Silicon

42 Nicotine and Cocaine are
A) Peptides
B) Tannins
C) Alkaloids
D) Resins

43 Helical structure of protein is stabilized by
A) Hydrogen bonds
B) Disulphide bonds
C) Peptide bonds
D) None of these

44 Oils are rich in
A) Esters and fatty acids
B) Saturated fatty acids
C) Glycerol that possess three hydroxyl groups
D) Fats that are generally liquids at room temperature

45 The most basic amino acid is
A) Arginine
B) Glycine
C) Histidine
D) Glutamine

46 Protein synthesis in an animal cell takes place in
A) Only in cytoplasm
B) In nucleolus as well as cytoplasm
C) In cytoplasm as well as mitochondria
D) Only in ribosomes attached to the nuclear envelope

47 ATP is a
A) Nucleotide
B) Nucleosome
C) Nucleoside
D) Purine

48 Conjugated proteins containing carbohydrates as prosthetic group are known as
A) Chromoproteins
B) Glycoproteins
C) Lipoproteins
D) Nucleoproteins

49 Enzymes are absent in
A) Algae
B) Fungi
C) Cyanobacteria
D) Viruses

50 A segment of DNA has 120 adenines and 120 cytosine bases the total number of nucleotides present in the segment is
A) 120
B) 240
C) 60
D) 480

ANSWER KEY

CHAPTER- THE LIVING WORLD

Answer 1: D (Living organisms are regarded as open system as energy flow is the key function of an ecosystem**.)**

Answer 2: B (The species is genetically distinct and reproductively isolated natural population. Sexual reproduction is absent in prokaryotes and some protists. In such cases morphological differences, cytotaxonomy and chemo-taxonomy are resorted to.)

Answer 3: (B) All the members of a species have similar karyotype (cytotaxonomy) - there is similarity in the number, size, shape and behaviour of chromosomes. At the molecular level, there is similarity in the types of proteins, enzymes, hormones and other biochemicals**.**

Answer 4: (B) In animals that do not contain a circulatory system, the transport of substances occurs by cell to cell diffusion. Bacteria, Protista do not have circulatory system. These organisms live in moist and watery environment.

Answer 5: (B) Anatomy is the study of internal structure which can be observed with unaided eye after dissection. By studying anatomy of large number of organisms, it is useful for knowing phylogenetic similarity (homology) and phylogenetic dissimilarity (analogy).

Answer 6: (C) Taxonomy is the science of identification, nomenclature and classification of organisms. But taxonomy and systematics are different terms. Systematics is the branch of biology that deals with diversity of organisms at every level of classification.

Answer 7: (C) Growth is the act or process, or a manner of growing; development; gradual increase. It is an exclusive event in majority of the higher animals and plants. In plants, growth occurs continuously throughout their life span and in animal, growth is seen only up to a certain age. In living organisms, growth is from inside. Therefore, it cannot be taken as a defining property of living organisms**.**

Answer 8: (B) Species refer to a group of organisms with fundamental similarities. A species is distinguished from the other closely related species based on distinct morphological differences. e.g., *Mangifera indica* (Mango), *Solanum tuberosum* (potato) and *Panthera leo* (lion). Therefore, all the three names, *indica*, *tuberosum* and *leo*, represent the specific epithets, while the first words *Mangifera*, *Solanum* and *Panthera* are genera.

Answer 9: (B) All organisms, from primitive prokaryotes to most advanced and complex eukaryotes, are able to sense and respond to environmental factors. The stimuli are perceived by sense organs in higher animals through sensory receptors e.g. eyes, ears, nose. Plants do not possess such sense organs. However, they do respond to external factors such as light, water, temperature, pollutants, other organism, etc. Human beings have an additional facility of self consciousness (awareness of self). Consciousness and response to stimuli are said to be the defining properties of living organisms.

Answer 10: (B) In fungi, vegetative reproduction occurs by fragmentation, budding (yeast), sclerotia, rhizomorphs, etc. Asexual reproduction occurs through formation of asexual spores such as zoospores, sporangiospores, chlamydospores, oidia, coidia, etc.

Answer 11: (A) Living organisms are made up of atoms and molecules which follow physical and chemical laws, so to understand them basic knowledge of physics and chemistry is required.

Answer 12: (C) Binomial nomenclature is the system of providing organisms with appropriate and distinct names consisting of two words, first generic and second specific.

Answer 13: (A) All organisms from primitive prokaryotes to most advanced and complex eukryotes are able to sense and respond to environmental factors. The stimuli are perceived by sense organs in higher animals through sensory receptors. Consciousness and response to stimuli are said to be the defining properties of living organism.

Answer 14: (A) It is nearly impossible to study all the living organisms. Classification refers to the process by which individuals are grouped into categories. So, classification makes it possible to study all the living organisms by studying the categorywise characteristics

Answer 15: (B) Living beings are objects exhibiting growth, development, responsiveness and other characteristics of life. They have their own specific form and structure. Living organisms exhibit properties such as metabolism, growth, reproduction, consciousness, etc. Thus, living organisms are considered as self replicating, evolving and self regulatory interactive systems capable of responding to external stimuli, sharing a common genetic material to varying degree both horizontally and vertically.

Answer 16: (I) A

Answer 16: (II) B

Answer 16: (III) D

Answer 16: (IV) C

Answer 16: (V) B

Answer 17: (I) C

Answer 17: (II) B

Answer 17: (III) C

Answer 17: (IV) D

Answer 17: (V) C

Answer 18: B (Reproduction ensures the continuity of the species, generation after generation. Genetic variation is created and inherited during reproduction.)

Answer 19: A (All living organisms are continuously making or breaking biomolecules, such conversions are due to chemical reactions, and sum total of all such chemical reactions, occurring in the body is called metabolism. Each metabolic pathway in the cell is tightly regulated by enzymes.)

Answer 20: A

Answer 21: C (The name of genus starts with capital letter and name of species starts with small letter. Scientific name is written in italics)

Answer 22: A (The order generally ends with ales. Order being a higher category is the assemblage of families which exhibit a few similar characters.)

Answer 23: D (All living beings share certain unified and basic characteristics. These include organisation, energy utilization, regulation or homeostasis, growth, development, reproduction and adaptation.)

Answer 24: C (The term biodiversity is used for the variety and variability among all forms of living organisms like plants, animals, and microorganisms present in a given region under natural conditions. Biodiversity can be defined as the totality of genes, species and ecosystem of a region. India is very rich in biodiversity.)

Answer 25: A

Answer 26: B

Answer 27: B (ICZN -International code of zoological nomenclature.)

Answer 28: D (Taxon is a grouping of organisms of any level in hierarchial classification which is based on some common characteristics. It represents real biological objects placed in any category while category itself is an abstract term.)

Answer 29: D (Kingdom is the largest taxon and order is smallest .)

Answer 30: C (In printed scientific names, only the genus is capitalized. Genus is an assembly of related species which evolved from a common ancestor and have certain common characters. Eg, Solanum tuberosum and Solanum

Answer 31: D (Taxonomic hierarchy is the sequence of arrangements of taxonomic categories in a descending order during the classification of organisms. Each category of taxonomic hierarchy refers to as a unit of classification. Classification is the process by which anything is grouped into convenient categories based on some easily observable characters. Systematics(term coined by Linnaeus) is the study of historical relationships of groups of biological organisms. Nomenclature is giving distinct scientific names to various structures including living organisms for their identification.)

Answer 32: C (Growth is the act or process, or a manner of growing; development; gradual increase. It is an exclusive event in majority of the higher animals and plants. In plants, growth occurs continuously throughout their life span and in animal; growth is seen only up to a certain age. In living organisms, growth is from inside. Therefore, it cannot be taken as a defining property of living organisms.)

Answer 33: D (All the statements regarding nomenclature are correct. Nomenclature is giving distinct scientific names to various structures including living organisms for their identification. It is a set of rules used for forming the names or terms in a particular field of arts or sciences. Nomenclature is only possible when the organism is described correctly and we know to what organisms the name is attached to.)

Answer 34: A

Answer 35: A (In plants, growth by cell division occurs continuously throughout their life span.)

Answer 36: B (Genus comprises a group of related species which has more characters in common in comparison to species of other genera. Organisms placed in the same genus are most closely related.)

Answer 37: D (Biodiversity is the term used to describe the variety of life found on Earth and all of the natural processes. This includes ecosystem, genetic and cultural diversity, and the connections between these and all species. The different aspects of biodiversity all have a very strong influence on each other.)

Answer 38: B (An isolated metabolic reaction(s) outside the body of an organism, performed in a test tube is neither living nor non living. Metabolism is the sum total of all chemical reactions occuring in our body.)

Answer 39: C (The term ‘taxon’ is used to refer to any rank or level or category of the classification.)

Answer 40: D (All the given statements are correct. All living organisms have the ability to respond the environment stimuli which could be physical, chemical or biological. Plant responds to external factors like light, water, temperature etc. Photoperiod is defined as the developmental responses of plants to the relative lengths of light and dark periods. It exclusively affects the reproduction in seasonal breeders, both plants and animals .Human being is the only organism who has self – consciousness.)

Answer 41: A (All the given descriptions are related to taxonomic category called species. Species, the lowest category in the taxonomic hierarchy, is the basic unit of taxonomy. It is the group of individual organisms with fundamental similarities.)

Answer 42: D (Taxon is a group of one or more population of organisms.
Kingdom, division and species come under taxon but Biodiversity is a term used to describe variety of all the species of living organisms on earth.

ANSWER KEY

Chapter 2– Biological Classification

1.A 2.A 3.C 4.B 5.C 6.D 7.B 8.C 9.A 10.A 11.A 12.B 13.D 14.D 15.C
16.C 17.D 18.B 19.A 20.D 21.D 22.C 23.A 24.B 25.C 26.C 27.B 28.B 29.A 30.B
31.D 32.C 33.B 34.B 35.C 36.A 37.C 38.D 39.D 40.C 41.D 42.D 43.A 44.A 45.B
46.C 47.B 48.B 49.D 50.C

CHAPTER3 - PLANT KINGDOM

ANSWER KEY

1. (c) Pinus is monoecious for it bears both types of cones on the same tree on separate branches. The male cone comprises of a number of small spirally arranged microsporophyll's. Each microsporophyll bears two microsporangia or pollen sacs on the lower surface of its horizontal position.

2. (c) Archegonium is the female sex organ of the bryophytes. It appears for the first time in the liverworts and mosses and continues in the pteridophytes. Archegonium is absent in thallophytes (algae and fungi). Sex organs in them are male gametes and female gametes

3. (b) Mosses and lichens are the first organisms to colonise rocks and hence, are of great ecological importance. They cause decomposition of rocks making the substrate suitable for the growth of higher plants. Mosses form dense mats on the soil, and reduce the impact of falling rain and prevent soil erosion.

4. (a) The colour of the algal thallus is due to the presence of definite chemical compounds in their cells and varies in different classes of algae. These are called pigments. Each pigment has its own characteristic colour. The particular colour of an alga is due to the predominance of one pigment in a combination of several others. Each group of algae has its own particular combination of pigments and a characteristic colour which is not found in other algal groups.

5.(b) The leaves in gymnosperm are well adapted to withstand extremes of temperature, humidity and wind. In conifers, the needle like leaf reduces the surface area. Their thick cuticle and sunken stomata also help to reduce the water loss. Unlike bryophytes and pteridophytes, in gymnosperms, the male and female gametophytes do not have an independent free-living existence. They remain within the sporangia retained on the sporophytes.

6. (a) Unicellular algae Chlorella and Spirulina are rich source of proteins and hence are used as food supplement by space travellers

7. (d) In bryophytes, antheridia are well developed and often possess a stalk. In pteridophytes, antheridia are less developed and are generally devoid of a stalk. Pteridophytes have

multiflagellate sperm formed from androcyte cell of antheridium. Bryophytes have biflagellate sperm.

8.(b) Fragmentation leads to an increase in the number of plants in a locality but it does not permit the spread of the plant to an entirely new locality. Gemmae are easily carried as they are small and sufficiently buoyant. They spread by water and wind currents to new habitats when detached, where each grows into a new individual immediately.

9. (c) In the pteridophytes, the sporophyte gains physiological independence and develops into the dominant, typically photosynthetic phase of the life cycle. It is organized into stem, leaves and roots.

10. (b) In Liverworts, antheridia(male) are produced on antheridiophore and archegonia(female) are borne on special stalked structure called archegoniophore. Both male and female sex organs may be present on same thalli or different thalli. Sporophyte is formed from the zygote which is differentiated into foot, seta and capsule

11. (b) Gametophyte's bear male and female sex organs called antheridia and archegonia, respectively in pteridophytes. Water is required for transfer of the male gametes released from the antheridia, to the mouth of archegonium. Fusion of male gamete with the egg present in the archegonium results in the formation of zygote. Zygote thereafter produces a multicellular well differentiated sporophyte, the dominant phase of the pteridophytes.

12. (d) All the spores are of similar kinds in majority of the pteridophytes; such plants are called homosporous. Genera like Selaginella and Salvinia produce two kinds of spores i.e., macro (large) spores and micro (small) spores, hence, are known as heterosporous

13. (a) Bryophytes require an external layer of water on the soil surface for their existence and thus are called terrestrial amphibians. The external supply of water is required for

(a) dehiscence of antheridia and archegonia

(b) swimming of male gametes to reach archegonia

(c) protection from transpiration and desiccation as the plant body is not covered by cuticle
(d) supply of water to all plants through capillarity in the absence of vascular tissues.

14. (c) Chlorophyceae are commonly called green algae. The plant body may be unicellular, colonial or filamentous. They are usually grass green in colour due to the dominance of pigments, chlorophyll a and b.

15. (a) Gametophytes are retained within sporangia in gymnosperms.

16.(i) c the defining features of bryophytes are: Their life cycles are dominated by a multicellular gametophyte stage. In a bryophyte, all the vegetative organs belong to the gametophyte, which is the dominant and most familiar form; the sporophyte appears for only a short period. The sporophyte is dependent on the gametophyte and remains permanently attached to it in order to gain nutrition and protection.

16(ii)d

16(iii)d The sporophyte is dependent on the gametophyte and remains permanently attached to it in order to gain nutrition and protection.

16(iv)d. In Bryophytes vascular tissue (i.e., xylem and phloem) are completely absent. Water and nutrients enter cell by diffusion when in pteridophytes vascular tissue consists of xylem (without true vessels) and phloem (without companion cells).

16(v) A Male sex organ is globular called antheridium and produces biflagellate sperms (antherozoids). Both flagella are similar, attached apically and are whiplash type.

17.(i) c. A species that is dioecious has individuals that are either male or female. Many plants have both male and female reproductive organs within the same individual.

17 (ii)a is correct. Conifers, such as pines, produce softwood, which is used to make paper and timber products.

17(iii)c is correct. The cone is the reproductive body of the gymnosperm. Gymnosperms have male and female cones, which are different in appearance.

17(iv)c is correct. Conifers (Gymnosperms) are adapted to tolerate extreme environmental condition because of thick cuticle, sunken stomata and needle like leaves.

17(v)b is correct. Cycas is a gymnosperm and Adiantum is a pteridophyte. ... Both Cycas and Adiantum resemble each other in having multi-ciliated sperms.

18. (c) Fusion of two motile gametes which are dissimilar in size is termed as anisogamy.
19.(c) The plant body of phaeophyceae is usually attached to the substratum by a holdfast, and has a stalk, the stipe and leaf like photosynthetic organ—the frond.
20. (d) A plant shows thallus level of organization. It shows rhizoids and is haploid. It needs water to complete its life cycle because the male gametes are motile. It may belong to

bryophytes.

21. (c) In pteridophytes, meiosis or occurs at the time of spore formation. The spores germinate to give rise to inconspicuous, small but multicellular, free-living, mostly photosynthetic thalloid gametophytes called prothallus. Prothallus represents the gametophytic phase in pteridophytes.

22. (d) Plants of this group are diploid and well adapted to extreme conditions. They grow bearing sporophylls in compact structures called cones. The group in reference is gymnosperms.

23. (a) The predominant stage of the life cycle of a moss is the gametophyte which consists of two stages. The first stage is the protonema stage (juvenile stage) and the second stage is the leafy stage. Moss protonema resembles to multicellular green algae in structure. Moss plant develops from protonema.

24.(d) One of the gymnosperms, the giant redwood tree Sequoia is one of the tallest tree species.

25.(d) Primitive vascular plants come under the pteridophytes. They are commonly called ferns.

26.(b) Bryophytes are the plants which produces spores and embryos but they do not have vascular tissue system.

27.(c) Red algae are red because of the presence of the pigment phycoerythrin; this pigment reflects red light and absorbs blue light.

28. (b)Spore bearing plants such as mosses and ferns belong to cryptogams because instead of reproducing by flowers and seeds they reproduce by means of spores.

29. (b) Pteridophytes and gymnosperms do have vascular tissues. However, gymnosperms bear seeds while pteridophytes not bear seeds. Algae and bryophytes do not possess vascular tissues.

30. (b)Gymnosperms refers to the group of naked seed-bearing vascular plants. Their seeds are naked as these are not enclosed in an ovary, like that of the angiosperms. This group includes large trees, like the pines, conifers, cycads and Ginkgo.

31. (d) Chlamydomonas

In zygotic meiosis, meiotic division happens in zygote resulting in the development of haploid individuals. Thallophytes have dominant gametophytic generation i.e., the proximity

of haploid individuals. As Chlamydomonas pertains to kingdom Plantae and division Thallophyta, zygotic meiosis is the characteristic feature observed in them.

32. (d)Pinus the gymnosperm which possess both male and female reproductive parts and thus called monoecious. Whereas Cycas posses either male or female reproductive part, Equisetum produces the same type spore (homosporous) and Salvinia produces different types of spores (heterosporous).

33. (a)Volvox is a unicellular green alga found in freshwater bodies.

34.(b) bryophytes are the first plant to inhabit the land.

35.(b) Agar, also called agar-agar, gelatin-like product made primarily from the red algae Gelidium and Gracilaria (division Rhodophyta). Agar is isolated from the algae as an amorphous and translucent product sold as powder, flakes, or bricks.

36.(b) Peat is mainly an accumulation of partially decayed vegetation or organic matter and Sphagnum accumulations can store water since both living and dead plants can hold large quantities of water and living matter (like meat eggs) for long distance transport inside their cells hence, it is responsible for peat formation.

37.(c) Isogamy is found in Spirogyra in which both gametes are non-motile. Isogamous: a condition in which the sexual cells, or gametes, are of the same form and size and are usually indistinguishable from each other.

38. (c)Multicellular fungi, filamentous algae and protonema of mosses all show multiplication by fragmentation. Multicellular fungi, filamentous algae and protonema of mosses all show multiplication by fragmentation.

39.(b) *Bryophytes and Pteridophytes* require water for fertilization and have motile *male gametes*.

40.(c) Evolutionary important character of Selaginella is heterosporous nature. Heterospory in the life cycle of Selaginella leads to the formation of seed habit.

41. **(d)** A water-soluble accessory pigment found in red algae and cyanobacteria is phycobilin.

42. (b)chlorophyll a and carotene

ANSWER KEY
Chapter 4 Animal Kingdom

Answer:1
(a) Radial symmetry is advantageous for an animal in responding to stimuli from any direction thereby allowing it to detect food and danger easily.

Answer:2
(d) Many animals have an endoskeleton and exoskeleton such as Chelon-turtle or Testudo-tortoise. Exoskeleton of other animals include chitinous plate, calcareous shell, horny scales, feathers, hair, claws, nails, hoofs, horns and antlers.

Answer: 3
(c) Cold blooded animals do not need to stay warm and can let their body temperatures get closer to that of their surroundings. Thus, they do not need to have extra insulation.

Answer:4
(b) Spicules help in making skeleton of sponges. These are made up of silica, calcium or spongin substances. The structure of spicules also help in classification of sponges.

Answer: 5
(b) Sponges belong to Porifera and they have characteristic canal system.

Answer: 6
(b) Sponges are multicellular but they have cellular level of body organization i.e., true tissue, movable parts, or appendages are not formed. Although, there is some physiological division of labour, accompanied with structural differentiation amongst body cells. But here, similar cells are arranged neither in permanent layer nor masses to form tissues.

Answer: 7
(a) All members of animalia are multicellular, but all of them do not exhibit the same pattern of organization of cells. In sponges, the cells are arranged as loose cell aggregates, i.e., they exhibit cellular level of organisation while, higher animals have tissue or further organ system level of organization.

Answer: 8
(a) Leucosolenia shows simplest type of canal system. In this, surrounding water enters the canal system through ostia. This water of sea enters into the spongocoel and is pushed out

readily through osculum. Course taken by the water current in the body of sponge may be shown as under.
Ingressing → Spongocoel → To outside

Answer: 9
(d) Robert Grant (1857) was the first to recognise and prove the true animal nature of sponges. The animal nature of sponges was well established on the following grounds-
(i) Sponges feed on in water solid particles. Their mode of nutrition is truly holozoic.
(ii) Sponge cells are devoid of cellulose cell walls.
(iii) Life cycle of sponges include swimming ciliated larval stages resembling those of other marine animals. Sponges are sessile and digestion is very simple without any apparent way of capturing food or eliminating wastes.

Answer:10
(d) Digestive tract in ctenophores consists of mouth, pharynx or stomodaeum, stomach or infundibulum, anal canals and two anal pores. Since there are mouth and anal pores present, the digestive tract is complete. Thus, digestion is both extracellular and intracellular.

Answer:11
(b) Cnidoblast cells are present on the tentacles and the body of cnidarians. A cnidoblast (also called nematoblast) has nematocyst known as 'stinging organ' (consisting of capsule, shaft and thread tube) used for anchorage, defence and offence.

Answer:12
(c) Coelenterata is the phylum of acoelomate and radially symmetrical lower invertebrates. Due to their radial body symmetry, they are also known as radiata. Bilateral symmetry starts from the phylum platyhelminthes.

Answer:13
(c) H. viridis is green in colour. Its bright green colour is not because of chlorophyll containing chloroplasts, but due to the presence of symbiotic zoochlorallae, Chlorella vulgaris, a unicellular green alga, that lives in its gastrodermal cells.

Answer:14
(a) Coelenterates possess a very primitive type of nervous system. This system is composed of many nerve cells. In coelenterates, separate mechanisms for digestion, respiration, excretion and reproduction etc. have evolved for the first time. Thus, there is a constant need to maintain coordination between these systems. Nerve cells are developed for this purpose, for the first time in coelenterates.

Answer 15.
(a) Hydroid colony of Obelia is dimorphic, exhibiting two types of individuals or zooids which differ both morphologically as well as physiologically. These two zooids are-
(i) Polyps – the nutritive zooid of the colony
(ii) Gonangium – the reproductive zooid.

Case study:
Answer1.
a)The identity of the crawling animal is earthworm.
b) it lives in burrows inside the soil. In rainy season, the burrows get filled up with rain water. So the earthworms come out of them.
c) annelida.
d) metamerism, long segmented body, triploblastic bilateral symmetrical.

Answer:2.

a)Bat is not a bird. It is a mammal that has patagia in the fore limbs to function as wings and help in flight.
b)Bat does not require sharp vision for its flight. It flies through écholocation or sending echo waves that are interpreted to know the obstacles. Bat, therefore, "sees through its ears."

c) Chordata
d)Bat feeds on small flying insects. The insects are located through sound waves produced by them. Feeding on insects functions as biocontrol method on the population of night flying insects. It is rule of nature and keeps ecological balance.

Multiple choice questions
Q1.Answer: (a) Pila sp.

Question 2.
Answer: (c) Cartilaginous

Question 3.
Answer: (c) Reptiles

Question 4.
Answer: (d) three pairs of ganglia
Answer: (c) Crocodilus – 4-chambered heart
Explanation:
Hippocampus (sea horse) belongs to class osteichthyes. It has 2-chambered heart (one auricle and one ventricle).

Rana (frog) belongs to class amphibia. It has a 3-chambered heart (two auricles and one ventricle).
Crocodilus (crocodile) belongs to class reptilia. It is an exception in reptiles.
Pavo (peacock) belongs to class aves. It has 4-chambered heart.

Question 6.
Answer: (d) Linnaeus

Question 7.
Answer: (a) Platypus lays eggs

Question 8.
Answer: (b) super class pisces

Question 9.
Answer: (d) Chondrichthyes : possess cartilaginous endoskeleton

Question 10.
Answer: (d) Nematoda

Question 11.
Answer: (b) Aschelminthes
Explanation:
Aschelminthes is a pseudocoelomate.

Question 12.
Answer: (b) Radial

Question 13.
Answer: (a) Platyhelminthes

Question 14.

Answer: (c) Flower sap

Question 15.
Answer: (c) Typhus

Question 16.
Answer: (d) Pseudocoelom

Question 17.

Answer: (b) Sponges

Question 18.
Answer: (c) Digestive tract

Question 19.
Answer: (c) Sea-cucumber

20. Special character of Coelenterates is

Answer : b

21.
Answer : d

22.
Answer : b
23
Answer : c

24
Answer : d

25..
Answer : c

CHAPTER 5- MORPHOLOGY OF FLOWERING PLANTS

ANSWER KEY

Q1. e (The assertion is false but reason is true).

Q2. c (The assertion is true but the reason is false).

Q3. d (Both the assertion and reason are false).

Q4. a (Both the assertion and the reason are true and the reason is a correct explanation of the assertion).

Q5. a (Both the assertion and the reason are true and the reason is a correct explanation of the assertion).

Q6. e (The assertion is false but reason is true.

Q7. c (The assertion is true but the reason is false).

Q8. e (The assertion is false but reason is true).

Q9. e (The assertion is false but reason is true).

Q10. e (The assertion is false but reason is true).

Q11. b (Both the assertion and reason are true but the reason is not a correct explanation of the assertion).

Q12. e (The assertion is false but reason is true).

Q13. a (Both the assertion and the reason are true and the reason is a correct explanation of the assertion).

Q14. a (Both the assertion and the reason are true and the reason is a correct explanation of the assertion).

Q15. c (The assertion is true but the reason is false).

Q16. (I). a (Solanaceae).

(II). a (Berry or Capsule).

(III). a (Valvate).

(IV). a (Epipetalous).

(V). a (Belladonna, Ashwagandha).

Q17. (I). a (Tap Root).

(II). a (Prop).

(III). a (Stilt).

(IV). a (Storage).

(V). a (Rhizophora).

Q18. c (Adventitious roots).

Q19. c (Veins and veinlets in a lamina).

Q20. b (Orchids).

Q21. a (Fabacea).

Q22. b (Hilum).

Q23. b (Distal).

Q24. d (Endosperm is being used up by the developing embryo during seed development).

Q25. a (C, B, E, A, D).

Q26. a (Fibrous roots).

Q27. b (Adventitious root).

Q28. d (Pistia).

Q29. a (The vegetation found in marshy and saline lakes).

Q30. b (Stem).

Q31. c (Pitcher of Nepenthes).

Q32. a (Phylloclades).

Q33. d (Potato).

Q34. d (Turnip).

Q35. a (Opuntia).

Q36. a (Axillary bud).

Q37. b (Sucker).

Q38. c (Opuntia).

Q39. a (Three).

Q40. c (Australian Acacia).

Q41. d (Alstonia).

Q42. d (Soyabean).

Q43. a (Solanum).

Q44. c (Styles).

Q45. a (Style).

Q46. b (Inflorescence).

Q47. a (Inferior).

Q48. d (Plum).

Q49. d (Parietal).

Q 50. a (Dianthus).

CHAPTER7- STRUCTURAL ORGANISATION IN ANIMALS

ANSWER KEY

Question no	1	2	3	4	5	6	7	8	9	10
Answer	D	C	A	D	C	B	C	D	D	A
Question no	11	12	13	14	15	16(1)	16(2)	16(3)	16(4)	16(5)
Answer	C	D	A	A	B	Blood	Tendon	A	D	C
Question no	17(1)	17(2)	17(3)	17(4)	17(5)	18	19	20	21	22
Answer	C	D	A	A	B	C	B	B	A	B
Question No	23	24	25	26	27	28	29	30	31	32
Answer	A	C	C	C	A	B	B	A	C	D
Question No	33	34	35	36	37	38	39	40	41	42
Answer	D	C	B	D	D	A	C	A	D	D
Question no	43	44	45	46	47	48	49	50		
Answer	D	B	C	B	B	C	A	B		

CHAPTER 8 - CELL-THE UNIT OF LIFE

ANSWER KEY

Question No	1	2	3	4	5	6	7	8	9	10
Answer	**d**	**a**	**d**	**c**	**a**	**d**	**b**	**b**	**a**	**d**
Question No	11	12	13	14	15	16	17	18	19	20
Answer	**a**	**a**	**a**	**c**	**a**	**b**	**b**	**d**	**a**	**a**
Question No	21	22	23	24	25	26	27	28	29	30
Answer	**b**	**c**	**b**	**b**	**b**	**b**	**a**	**c**	**d**	**b**
Question No	31	32	33	34	35	36	37	38	39	40
Answer	**a**	**a**	**c**	**b**	**d**	**d**	**a**	**b**	**c**	**b**
QUESTION NO	41	42	43	44	45	46	47	48	49	50
Answer	**d**	**c**	**a**	**d**	**c**	**d**	**a**	**d**	**d**	**b**

ANSWER KEY

CHAPTER 9- BIOMOLECULES

1-b.	11-a.	17. (i)-c.	23-c.	33-a.	43-a
2-b.	12-a.	(ii)-c.	24-d.	34-a.	44 -d
3-c.	13-a.	(iii)d.	25-c.	35-b.	45-a
4-c.	14-b.	(iv)-d.	26-b.	36-b.	46-c
5-a.	15-d.	(v)-a.	27-a.	37-a.	47-a
6-c.	16. (i)-c.	18-b.	28-d.	38-a.	48-b
7-a.	(ii)-b.	19-b.	29-a.	39-a.	49-d
8-b.	(iii)-d.	20-b.	30-d.	40-b.	50-d
9-b.	(iv)-d.	21-d.	31-c.	41-d	
10-b.	(v)-a.	22-a.	32-d.	42-c	