BRAIN INTERNATIONAL SCHOOL

SESSION 2024-25

CLASS: XI **ANNUAL SAMPLE PAPER 1** **SUBJECT: BIOLOGY**

General Instructions:

1. All questions are compulsory.
2. The question paper has five sections and 33 questions. All questions are compulsory.
3. Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4 marks each; and Section–E has 3 questions of 5 marks each.
4. There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
5. Wherever necessary, neat and properly labeled diagrams should be drawn.

Section A

1. Taxonomic key is one of the taxonomic tools in the identification and classification of plants and animals. It is used in the preparation of [1]

   a) Fauna
   b) Monographs and Flora
   c) Monographs
   d) Flora

2. Which one of the following is also known as antidiuretic hormone? [1]

   a) Calcitonin
   b) Adrenaline
   c) Vasopressin
   d) Oxytocin

3. Length of DNA with 23 base pairs is _____. [1]

   a) 78.2 A^o
   b) 78.4 A^o
   c) 74.8 A^o
   d) 78 A^o

4. Open bundle is found in which of the following? [1]

   a) Monocot stem
   b) Dicot leaf
   c) Monocot root
   d) Dicot stem

5. Respiratory process is regulated by certain specialized centres in the brain. One of the following centres can reduce the inspiratory duration upon stimulation: [1]

   a) Medullary inspiratory centre
   b) Apneustic centre

c) Chemosensitive centre
d) Pneumotaxic centre

6. Carotenes protect plants from: [1]

a) Photosynthesis
b) Photo-oxidation
c) Photorespiration
d) Desiccation

7. During micturition, the muscles of urinary bladder, and urethral sphincters will: [1]

a) Keep expanding
b) Show fatigue
c) Contract and relax respectively
d) Relax and contract respectively

8. Platelets are formed from the_____. [1]

a) Haemocytes
b) Microkayocytes
c) Thrombocytes
d) Megakaryocytes

9. Which of the following gibberellic acid is used for malting process in the brewing industry? [1]

a) GA_1
b) GA
c) GA_2
d) GA_3

10. Which of the following includes a diploid structure? [1]

a) Gametophyte and antheridia
b) Gametophyte and spore mass
c) Gametophyte and Capsule
d) Gametophyte and oospores

11. Rahul is anaemic and a few days ago suffered from massive haemorrhage. Now, what problems he may face: [1]

a) No glomerular filteration
b) Accumulation of waste products in body
c) All of these
d) Very low blood pressure

12. Which is the main organ of respiration in amphibians? [1]

a) Lungs
b) Skin
c) Gills
d) Both Skin and Lungs

13. **Assertion (A):** Protoplasmic continuity is maintained in perforated septum.
Reason (R): Usually a small pore remains in the centre of the septum.

[1]

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

14. **Assertion (A):** Oxyhaemoglobin carries 1 - 4 molecules of oxygen in the blood. **[1]**

Reason (R): The capacity of oxyhaemoglobin depends on the degree of (Fe^{2+}) saturation with oxygen.

a) Both A and R are true and R is the correct explanation of A
b) Both A and R are true but R is not the correct explanation of A
c) A is true but R is false.
d) A is false but R is true.

15. **Assertion (A):** Ice melts into water or water becomes a vapour are physical processes.
Reason (R): A physical change simply refers to a change in shape without breaking of bonds.

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

b) Both A and R are true but R is not the correct explanation of A

c) A is true but R is false.

d) A is false but R is true.

16. **Assertion (A):** Inspiration is initiated by the contraction of the diaphragm which increases the volume of the thoracic chamber in the anteroposterior axis. [1]

Reason (R): The contraction of external intercostal muscles lifts up the ribs and the sternum causing an increase in the volume of the thoracic chamber in the dorsoventral axis.

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

b) Both A and R are true but R is not the correct explanation of A

c) A is true but R is false.

d) A is false but R is true.

17. Explain epidermal tissue system of plant. [2]
18. How do different senses work in frog? Explain in brief. [2]
19. Write short note on the function of Thymosins [2]
20. What are the two basic functions of biological classification? [2]
21. Does moonlight support photosynthesis? [2]

OR

How many molecules of carbondioxide, ATP and NADPH are required to make one molecule of glucose?

Section C

3 Marks

22. What are the main division of kingdom Plantae?
23. Differentiate between:
    i. Acoelomate and pseudocoelomate
    ii. Notochord and nerve cord
    iii. Polyp and medusa
24. Succinic dehydrogenase is an enzyme that causes the substrate, succinate, to breakdown into fumarate. Malonate is a substance that resembles succinate and inhibits the activity of succinic dehydrogenase.
    i. State the type of inhibition of succinic dehydrogenase by malonate.
    ii. Explain how this type of inhibition affects the activity of the enzyme.

25. Distinguish between Auxins and Gibberellins.

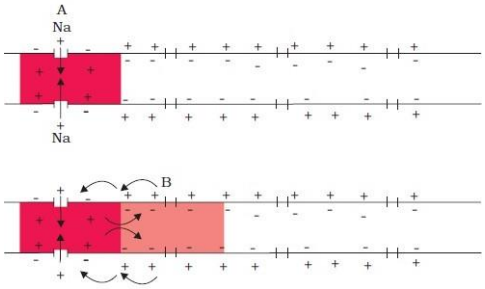
26. Differentiate between a ball and socket joint and a pivot joint.

27. Explain the chemical events that take place to form a blood clot to seal the wound.

OR

Write a note on regulation of cardiac activity.

28. Examine the following diagram and answer the following questions:



i. What is the diagram representing?

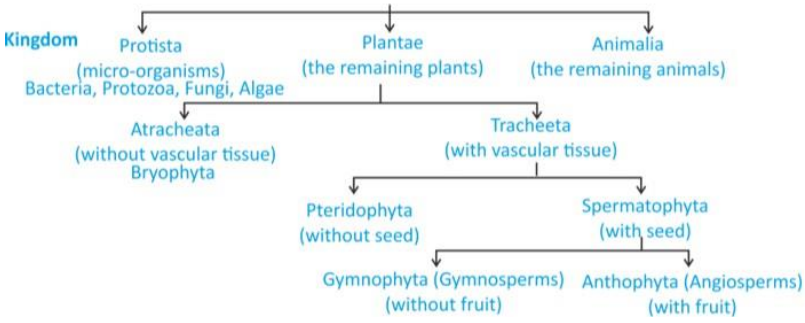
ii. When point A becomes permeable to Na^+, what change occurs in the polarity of the membrane.

iii. What is the potential difference at point A called?

Section D

29. **Read the following text carefully and answer the questions that follow:**

Linnaeus gave two kingdom classification/which consists of kingdom Plantae and kingdom Animalia. This classification was based on the mode of nutrition/ reproduction/ presence or absence of cell wall. However, this system had many drawbacks like there was no distinction between eukaryotes and prokaryotes. Then, came the three-kingdom classification in which single-celled bacteria and protozoans were kept in the kingdom Protista. This system also failed to classify all living organisms into appropriate categories. Finally a five Kingdom classification was proposed by dividing all the organisms into five kingdom and it will be accepted as modern system of classification.



i. We know that Haeckel proposed the term Protista for unicellular organisms. Observe the given flowchart and mention what are advantages does the five-kingdom classification have over the two-kingdom classification? (1)

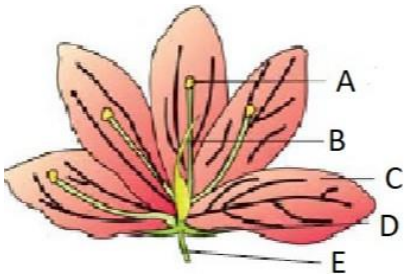
ii. All eukaryotic unicellular organisms belong to which kingdom? Also, mention its two characteristics. (1)

ed the five-kingdom classification? And which criteria were used to classify organism in the 5-kingdom system? (2)

30. Read the following text carefully and answer the questions that follow:

Each flower normally has four floral whorls, viz., calyx, corolla, androecium and gynoecium. The calyx is the outermost whorl of the flower and the members are called sepals. Corolla is composed of petals. Petals are usually brightly coloured to attract insects for pollination. The mode of arrangement of sepals or petals in floral bud with respect to the other members of the same whorl is known as aestivation. The main types of aestivation are valvate, twisted, imbricate. The shape and colour of corolla vary greatly in plants. Corolla may be tubular,

bell- shaped, funnel-shaped or wheel-shaped and vexillary.



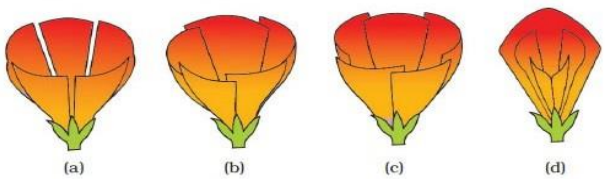
i. Observe the given figure mentioned A, B, C and D. Also mention its function. Identify D and mention its example. (1)

ii. Ganosepalous, Ganopetalous, Polysepalous, Polypetalous, Imbricate. (1)

iii. What is Valvate and twisted aestivation? (2)

OR [4]

Which of the following shows imbricate? Explain imbricate aestivation? (2)



Section E 5 Marks

31. Explain, why a pair of homologous chromosomes is genetically different, but a pair of sister chromatids is genetically identical before crossing over in meiosis.

OR

Describe meiosis II with the help of suitable diagrams.

32. Explain ETS

OR

How do plants manage the exchange of gases? Give an overview of respiration in plants.

33. What is the difference between cell wall and ribosomes of a prokaryotic and a eukaryotic cell?

OR

Give a detail description of plastids with the help of suitable diagram

BRAIN INTERNATIONAL SCHOOL

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CLASS: XI **ANNUAL SAMPLE PAPER 2** **SUBJECT: BIOLOGY**

General Instructions:

1. All questions are compulsory.
2. The question paper has five sections and 33 questions. All questions are compulsory.
3. Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4 marks each; and Section–E has 3 questions of 5 marks each.
4. There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
5. Wherever necessary, neat and properly labeled diagrams should be drawn.

Section A

1. A group of plants with similar traits of any rank is _____. [1]

   a) Species b) Genus

   c) Order d) Taxon

2. The following substances are the excretory products in animals. Choose the least toxic form among them. [1]

   a) Carbon dioxide b) Ammonia

   c) Urea d) Uric acid

3. Double helix model of DNA was proposed by proposed by: [1]

   a) Kornberg b) Holley and Nirenberg

   c) Nirenberg d) Watson and Crick

4. Dicot leaves are also known as _____. [1]

   a) Bilateral leaves b) Dorsiventral leaves

   c) Isobilateral leaves d) Dorsal leaves

5. The solubility of carbon dioxide is: [1]

   a) 20 - 25 times lower than that of oxygen b) 10 - 15 times lower than that of oxygen

   c) 20 - 25 times higher than that of oxygen d) 10 - 15 times higher than that of oxygen

6. C_4 plants differ from C_3 plants with respect to: [1]

   a) Type of soil b) First product

   c) Number of ATP molecules produced d) Water availability

7. People with chronic kidney disease are usually affected by anaemia. It happens because a damaged kidney doesn't secrete sufficient: [1]

a) Erythropoietin
b) Angiotensin II
c) Angiotensin I
d) Atrial natriuretic factor

8. Frog shows which kind of excretion? [1]

a) Ammonotelic in water and ureotelic on land
b) Ureotelic
c) Uricotelic
d) Ammonotelic

9. Coconut water contains: [1]

a) Auxin
b) ABA
c) Cytokinin
d) Gibberellin

10. Which one is peat moss? [1]

a) Marchantia
b) Sphagnum
c) Equisetum
d) Chara

11. Which of the following pairs is wrong? [1]

a) Ammonotelic - Tadpole
b) Uricotelic - Birds
c) Ureotelic - Elephant
d) Ureotelic - Insects

12. Select out of the following that group which includes only anaerobes in it. [1]

a) Silverfish, Fasciola, Echinococcus, Periplanata
b) Yeast, Planaria, Amoeba, Agaricus
c) Taenia, Saccharomyces, Ascaris, Liver fluke
d) Roundworm, Tapeworm, Starfish, Cockroach

13. **Assertion (A):** Viruses are nucleoproteins and lack cell organelle, etc.
Reason (R): Viruses are not considered organisms. [1]

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

14. **Assertion (A):** When pure oxygen given to a patient for long time he will die. [1]
Reason (R): The role of oxygen in the regulation of respiratory rhythm is quite insignificant.

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

15. **A**

ssertion (A): Grape contains fructose.

Reason (R): Fructose is called fruit sugar. [1]

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

b) Both A and R are true but R is not the correct explanation of A

c) A is true but R is false

d) A is false but R is true

16. **Assertion (A):** Emphysema is a chronic disorder in which alveolar walls are damaged due to which respiratory surface is decreased.

Reason (R): One of the major causes of this is cigarette smoking.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

[1]

Section B

17. Write components of a stele. [2]
18. Frogs are beneficial for mankind, justify the statement. [2]
19. Distinguish between Hormone and vitamin. [2]
20. Write any three advantages of scientific names. [2]
21. Why does not photorespiration take place in C_4 plants? [2]

OR

In chloroplast what are sites for light reactions and dark reactions?

Section C

22. Write a note on economic importance of algae and gymnosperms. [3]
23. What is the relationship between germinal layers and the formation of body cavity in case of coelomate, acoelomates and pseudocoelomates? [3]
24. Nucleic acids exhibit secondary structure. Describe through Watson-Crick Model. [3]
25. State the three phases of growth. [3]
26. What makes the synovial joint freely movable? List any two types of synovial joints. [3]
27. Compare the effect of sympathetic nerves and vagus on the heart. [3]

OR

What is meant by double circulation? What is its significance?

28. Why is conduction in a nerve called on the electric phenomenon? [3]

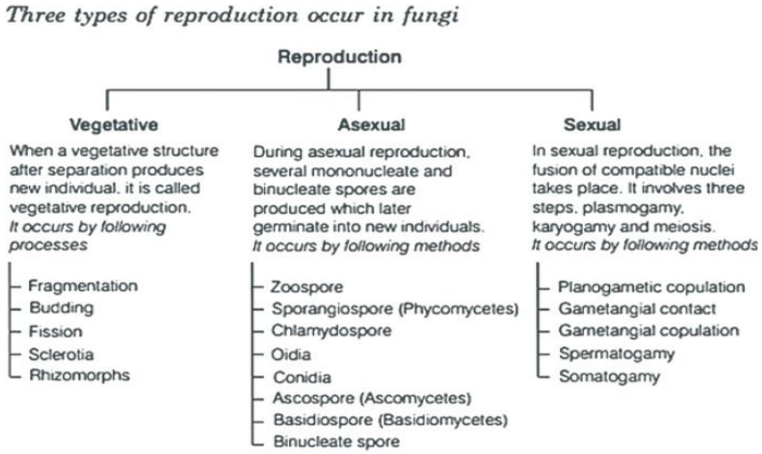
Section D

29. Read the following text carefully and answer the questions that follow:

The fungi constitute a unique kingdom of heterotrophic organisms. They show a great diversity in

morphology and habitat. Fungi are cosmopolitan and occur in air, water, soil, and on animals and plants. [4]
They prefer to grow in warm and humid places. Most fungi are heterotrophic and absorb soluble organic matter from dead substrates and hence are called saprophytes. When a fungus reproduces sexually, two haploid hyphae of compatible mating types come together and fuse. In some fungi, the fusion of two haploid cells immediately results in diploid cells (2n). The fungiform fruiting bodies in which reduction division occurs, leading to the formation of haploid

spores. Symbionts - in association with algae as lichens and with roots of higher plants as mycorrhiza.



i. Observe the given flow chart of reproduction and mention which steps involves in the sexual cycle of fungi. (1)

ii. What is Rhizopus? Also, mention Rhizopus - wheat rush a correct match? (1)

iii. What is Mycorrhiza? And mention its function. (2)

OR

In which form Fungi Stores Food Material? Do fungi have food vacuoles? (2)

30. Read the following text carefully and answer the questions that follow:

The flower is the reproductive unit in the angiosperms. It is meant for sexual reproduction. A typical flower has four different kinds of whorls arranged successively on the swollen end of the stalk or pedicel, called thalamus or receptacle. These are calyx, corolla, androecium and gynoecium. Calyx and corolla are accessory organs,

while androecium and gynoecium are reproductive organs. In symmetry, the flower may be actinomorphic (radial symmetry) or zygomorphic (bilateral symmetry). Based on the position of calyx, corolla and androecium in respect of the ovary on the thalamus, the flowers are described as hypogynous, perigynous and epigynous. A flower may be trimerous, tetramerous or pentamerous when the floral appendages are in multiple of 3, 4 or 5, respectively.

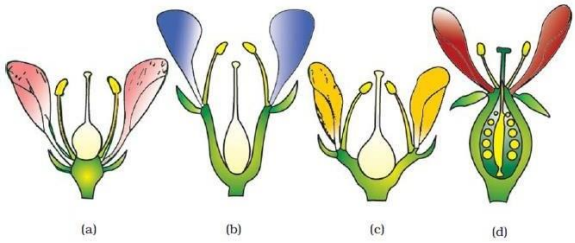
i. Observe the diagram given below. and mention what happens after the given stage. (1)

ii. Is Actinomorphic - datura the incorrect match? (1)

iii. When the ovary is superior it is called? (2)

OR

Which of the following represents epigynous? Also, mention what an epigynous flower is (2)



Section E 5 Marks

31. Mitosis results in producing two cells that are similar to each other. What would be the consequence if each of the following irregularities occur during mitosis?

i. Nuclear membrane fails to disintegrate

ii. Duplication of DNA does not occur

iii. Centromeres do not divide

iv. Cytokinesis does not occur.

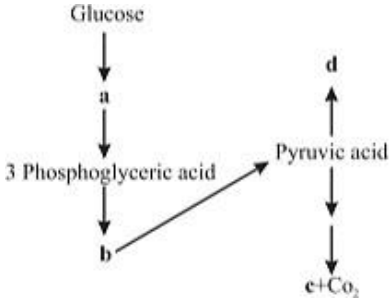
OR

Explain meiosis-II in an animal cell.

32. Describe the pentose phosphate pathway.

OR

In the following flow chart, replace the symbols a,b,c and d with appropriate terms. Briefly explain the process and give any two application of it.



33. Describe the structure of the following with the help of labelled diagrams.

i. Nucleus

ii. Centrosome

OR

Eukaryotic cells have organelles which may

i. not be bound by a membrane

ii. bound by a single membrane

iii. bound by a double membrane

Group the various sub-cellular organelles into these three categories.

BRAIN INTERNATIONAL SCHOOL

SESSION 2024-25

CLASS: XI **ANNUAL SAMPLE PAPER-3** **SUBJECT: BIOLOGY**

General Instructions:

1. All questions are compulsory.
2. The question paper has five sections and 33 questions. All questions are compulsory.
3. Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4 marks each; and Section–E has 3 questions of 5 marks each.
4. There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
5. Wherever necessary, neat and properly labeled diagrams should be drawn.

Section A

1. In a scientific name, the name of the author is printed in _____. [1]

   a) Abbreviated
   b) Bold
   c) Capital letters
   d) Italics

2. Urea cycle operates in: [1]

   a) Liver
   b) Lungs
   c) Skin cells
   d) Sweat glands and sebaceous glands

3. Proteins perform many physiological functions. For example, some function as enzymes. Which of the following represents an additional function that some proteins discharge? [1]

   a) Antibiotics
   b) Pigments making colours of flowers
   c) Pigment conferring colour to skin
   d) Hormones

4. What happens when stomata open? [1]

   a) Water enters the guard cell and Potassium exits from it
   b) Water and Potassium enter the guard cell
   c) Water exits from the guard cell and Potassium enters it
   d) Water and Potassium exit from the guard cell

5. Respiration in insects is called direct because: [1]

   a) Tracheal tubes exchange O_2/CO_2 directly with the haemocoel which then exchange with tissues.
   b) The tissues exchange O_2/ CO_2 directly with coelomic fluid.

c) The tissues exchange O_2/ CO_2 directly with the air outside through the body surface.

d) The cell exchange O_2/ CO_2 directly with the air in the tubes.

6. The C_4 plants show higher rate of photosynthesis in: [1]

a) Low temperature

b) High temperature

c) Optimum temperature

d) Absence of temperature

7. What is the average amount of urine produced by a human in a day? [1]

a) 1.4 litres

b) 15 litres

c) 18 litres

d) 180 litres

8. The lymph in frog lacks: [1]

a) RBC and plasma

b) Plasma and WBCs

c) WBCs and few proteins

d) RBCs and few proteins

9. Growth can be measured in various ways. Which of these can be used as parameters to measure growth? [1]

a) Increase in cell size

b) All of these

c) Increase in length and weight

d) Increase in cell number

10. Pteridophytes differ from mosses in having: [1]

a) Independent and dominant sporophyte

b) Dependent gametophyte

c) Independent gametophyte

d) Flagellate antheriozoids

11. The filtration fraction is the ratio of GFR to RPF where both the values are in ml/min and FF is expressed in percentage. Calculate FF for a normal adult human being, if RPF= 600ml/min: [1]

a) 2.08%

b) 10.38%

c) 20.73%

d) 20.83%

12. Insect of the family Chironomidae like Chironomous larvae are also known as bloodworms since: **[1]**

a) They contain haemocyanin as their respiratory pigment

b) They are blood parasites

c) They have only blood

d) They contain haemoglobin as their respiratory pigment

13. **Assertion (A):** Individuals of subphylum sporozoa lack locomotory organelles.

Reason (R): All sporozoa are parasites. [1]

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

b) Both A and R are true but R is not the correct explanation of A

c) A is true but R is false.

d) A is false but R is true.

14. **Assertion (A):** A sigmoid curve is obtained when percentage saturation of hemoglobin with O_2 is plotted against the $P_{o2.}$

Reason (R): Saturation is affected by factors like P_{co2} > H^+ concentration, etc

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

15. **Assertion (A):** Coenzyme A is a nucleotide.

Reason (R): CoA carries hydrogen.

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

b) Both A and R are true but R is not the correct explanation of A

c) A is true but R is false

d) A is false but R is true

16. **Assertion (A):** A person has died because of carbon monoxide poisoning.

Reason (R): A person slept in a closed room with a lamp burning. [1]

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

b) Both A and R are true but R is not the correct explanation of A

c) A is true but R is false

d) A is false but R is true

Section B

17. What is the difference between monocot and dicot leaves? [2]
18. Draw a well labelled diagram of both ventral and dorsal views of the brain of the frog. [2]
19. Describe the endocrine functions of the thymus. [2]
20. What makes species a basic taxonomic category? [2]
21. Explain the role of water in photosynthesis. [2]

OR

Can girdling experiments be done in monocots? If yes, How? If no, why not?

Section C

22. Bryophytes are found in which diverse habitats. Describe briefly. [3]
23. Differentiate between Exoskeleton and Endoskeleton: [3]
24. i. Name the category to fats belong?
    ii. What is cholesterol?
    iii. What are the two forms of cholesterol?

25. What induces ethylene formation in plants? Give two different actions of ethylene on plants. [3]

26. Distinguish between Single unit and Multiunit muscles. [3]

27. What is an artificial pacemaker? Explain. [3]

OR

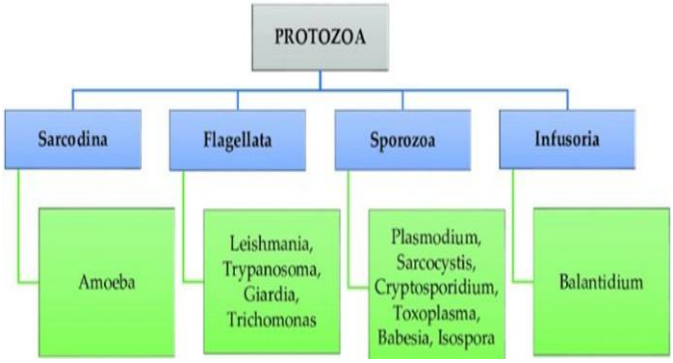
Differentiate between pulmonary and systemic circulation.

28. Name the parts of human forebrain indicating their respective functions. [3]

Section D

29. **Read the following text carefully and answer the questions that follow:**

Sarcodines are unicellular/jelly-like protozoa found in fresh or sea water and in moist soil. Their body lacks a periplast. Therefore, they may be naked or covered by a calcareous shell. They usually lack flagella and have temporary protoplasmic outgrowths called pseudopodia. These pseudopodia or false feet help in movement and capturing prey. They include free-living forms such as Amoeba or parasitic forms such as Entamoeba. Zoo flagellates ciliates and I sporozoans are other groups of protozoan protists. They are all unicellular and heterotrophic. They may be holozoic, saprobic or parasitic.



i. Write two lines about flagellated protozoans and also mention some flagellated protozoans. (1)

ii. Observe the given protozoan classification and mention what is the basis of protozoan classification. (1)

iii. Mention some locomotory organs of protozoa. (2)

OR

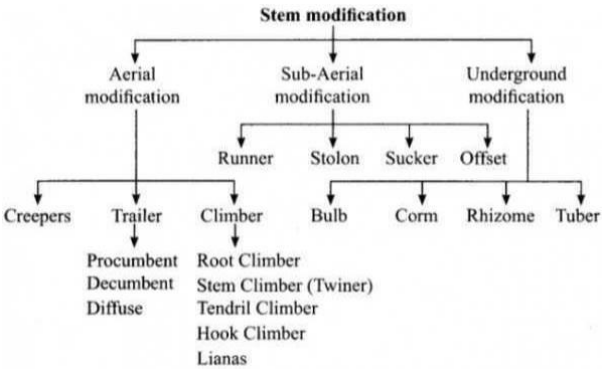
Which protozoan group has two nuclei, macronucleus, and micronucleus? Mention characteristics of it. (2)

30. Read the following text carefully and answer the questions that follow: (4)

Various parts of the plant such as stems leaves, and even fruits are modified into underground parts to perform various functions such as stems, leaves, and even fruits.

The stems in ginger and banana are underground and swollen due to storage of food. They are called rhizome. Rhizome of ginger is a modification of stem because it bears nodes, internodes, terminal buds, scaly leaves and buds, which give rise to aerial shoots. It is not a root because root does not have nodes and internodes. Also, rhizome does not perform the function of roots i.e. anchorage and absorption, rather it serve as reservoir for storage of food. Similarly, corm is an underground stem in Colocasia (jimikand) The tips of the underground

stem in potato become swollen due to accumulation of food and forms tuber.



i. Observe the given flow chart and mention what are the four types of Underground stem modification also mention one example of each. (1)

ii. Ginger is an underground stem but why it is distinguished from a root? (1)

iii. Why do the tips of modified stems in potatoes become swollen? (2)

OR

Are all underground parts of a plant roots? (2)

Section E

31. With the help of suitable diagrams describe mitosis. [5]

OR

What do you mean by cell cycle? Explain cell cycle and interphase in detail.

32. Does pyruvic acid enter the Krebs' cycle directly? [5]

OR

Explain the formation of NADH and ATP during glucolysis in aerobic respiration. [5]

33. Write the functions of the following

i. Centromere

ii. Cell wall

iii. Smooth ER

iv. Golgi Apparatus

v. Centrioles

OR

Discuss the basic structural organisation of a typical cell.