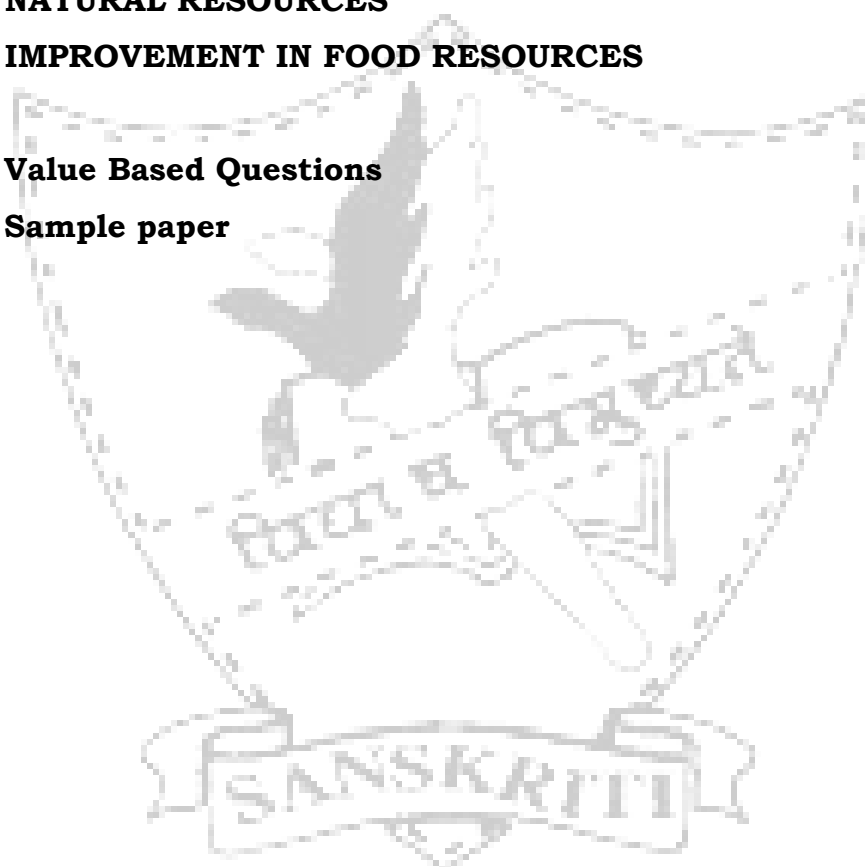


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SYLLABUS
COURSE STRUCTURE
CLASS IX

Units Marks

I	Food	13
II	Organisation in Living World -Cell Basic Unit of Life -Tissue	18
I	Organisation in Living World - Diversity in Plants and animals. - Health and Diseases	25
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Theme : Food

Unit : Food

Plant and animal breeding and selection for quality improvement and management; use of fertilizers, manures; protection from pests and diseases; organic farming.

Theme: The World of The Living

Unit: Organization in the living world.

Cell - Basic Unit of life: Cell as a basic unit of life; prokaryotic and eukaryotic cells, multicellular organisms; cell membrane and cell wall, cell organelles; chloroplast, mitochondria, vacuoles, endoplasmic reticulum, Golgi apparatus; nucleus, chromosomes - basic structure, number.

TISSUES, Organs, Organ System, Organism Structure and functions of animal and plant tissues (four types in animal tissues; meristematic and permanent tissues in plants).

Theme : The World of The Living

Unit: Organization in the living World.

Biological Diversity: Diversity of plants and animals - basic issues in scientific naming, basis of classification. Hierarchy of categories / groups, Major groups of plants (salient features) (Bacteria, Thalophyta, Bryo phyta, Pteridophyta, gymnosperms and Angiosperms). Major groups of animals (salient features) (Non-chordates upto phyla and chordates upto classes).

Health and Diseases: Health and its failure. Infectious and Non-infectious diseases,

their causes and manifestation. Diseases caused by microbes (Virus, Bacteria and protozoans) and their prevention, Principles of treatment and prevention. Pulse polio programmes.

Theme : Natural Resources**Unit : Our environment**

Physical resources: Air, Water, Soil.

Air for respiration, for combustion, for moderating temperatures; movements of air and its role in bringing rains across India. Air, water and soil pollution (brief introduction). Holes in ozone layer and the probable damages.

Bio-geochemical cycles in nature : Water, oxygen, carbon and nitrogen

PRACTICALS**List of Experiments**

1. To test (a) the presence of starch in the given food sample (b) the presence of the adulterant metanil yellow in dal.
2. To prepare stained temporary mounts of (a) onion peel and (b) human cheek cells and to record observations and draw their labeled diagrams.
3. To identify parenchyma and sclerenchyma tissues in plants, striped muscle fibers and nerve cells in animals, from prepared slides and to draw their labeled diagrams.
4. To determine the mass percentage of water imbibed by raisins.
5. To study the characteristic of *spirogyra/Agaricus*, Moss/Fern, *Pinus* (either with male or female cone) and an Angiospermic plant. Draw and give two identifying features of groups they belong to.
6. To observe and draw the given specimens-earthworm, cockroach, bony fish and bird. For each specimen record
 - a. one specific feature of its phylum.
 - b. one adaptive feature with reference to its habitat.
7. To study the external features of root, stem, leaf and flower of monocot and dicot plants.
8. To study the life cycle of mosquito.

Value Based Questions**For Class IX**

The Board has decided to assess students for 5 percent weighting in each subject at the Summative Assessment level in Class IX through questions which will be integrated with the content of the subject and analysed on the basis of the values it reflect

Chapter 5

THE FUNDAMENTAL UNIT OF LIFE**Assignment No. 5**

Q1. Match the following:

I. Single matching

Column I	Column II
a) Nucleus	i. Cellulose
b) Mitochondria	ii. Double membrane
c) Cell wall	iii. Cell sap
d) Vacuole.	iv. Power house

II. Double matching

Column I	Column II	Column III
a) Multicellular organisms	i. Lipids	1. Suicide bags
b) Plasma membrane	ii. Plants	2. Inner folded membrane
c) Mitochondria	iii. Digestive enzymes	3. Proteins
d) Lysosomes	iv. Outer porous membrane	4. Animals.

Q2. Name the organelles that contain genetic material.

Q3. Why are lysosomes called as suicidal bags?

Q3. Name the three types of plastids and the functions they perform.

Q4. Expand: RER, SER, DNA, ATP and ER.

Q5. Shape and size of cells are related to the function they perform. Explain with example.

Q6. A special process helps in the intake of oxygen inside the cells and release of carbon dioxide from the cells. Name the process.

Q7. Define Osmosis and Plasmolysis.

Q8. *Amoeba* is able to engulf its food due to the flexibility of the cell membrane. What is this process called as?

Q9. Egg membranes from three eggs were carefully taken out and labeled as A, B and C. Each of these membranes were filled with 1% solution of sugar. Membrane A was immersed in 0.5% sugar solution, Membrane B was immersed in 1% sugar solution and Membrane C was immersed in 2% sugar solution. Predict the behaviour of the three membranes.

Q10. Give four differences between the eukaryotic and prokaryotic cells.

Q11. Differentiate between plant cell and animal cell on the basis of:

Cell wall, vacuole and plastids.

Q12. Give the functions of the following (in one line)

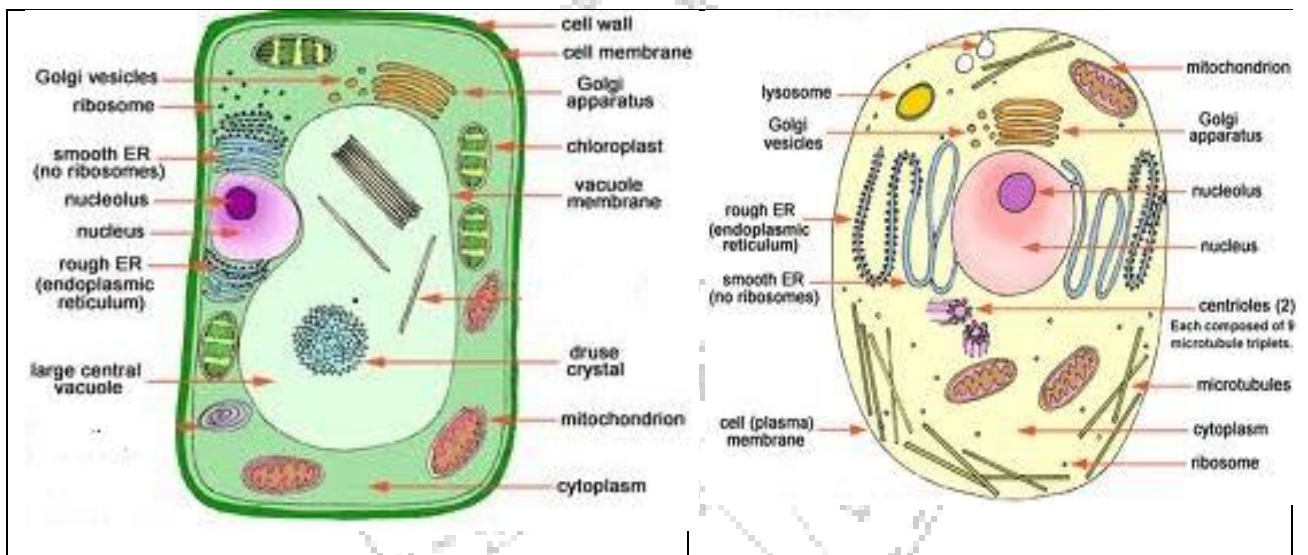
- a) Cell wall
- b) Cell membrane
- c) Nucleus
- d) Mitochondria
- e) Golgi apparatus
- f) Lysosomes
- g) Plastids
- h) SER
- i) RER
- j) Ribosomes

Q13. State the similarity between mitochondria and plastids.

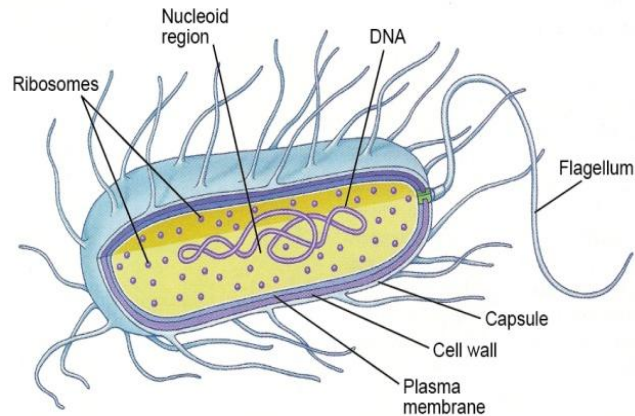
Q14. Name the substances stored in Vacuole.

Q15 .What is the percentage of plant cell volume does the central vacuole occupy?

Q16. Different parts of a cell are shown in the following diagram. Study the parts and in the table given write the names of each part in the appropriate column.



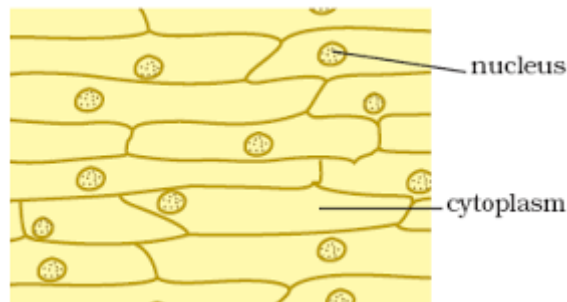
Found in plant cells only	Found in animal cells only	Found both in plant and animal cells



PROKARYOTIC CELL

Multiple choice questions Based on Practical Skills: Temporary Mount

- In order to locate the specimen under the compound microscope the objective lens to be used is
 - 10X
 - 40X
 - 100X
 - fine adjustment and 40X
- If the power of eyepiece is 10X and that of objective lens is 40X, then the total magnification of microscope will be
 - 10X
 - 400X
 - 100X
 - 4X
- The correct identification of the spot shown below is:



- Onion peel
 - Cheek cells
 - Sclerenchyma
 - Parenchyma
- While preparing the temporary mount of cheek cell the tissue that is scrapped from the inner side of cheek is:
 - epithelial tissue
 - muscular tissue
 - connective tissue
 - nervous tissue
 - The stain used in preparing temporary mount of cheek cell is
 - glycerine
 - safranin
 - water
 - methylene blue

- 6) Which of the following organelle is visible in the temporary mount of cheek cell
a) nucleus b) mitochondria c) golgi body d) lysosomes
- 7) To avoid air bubble during the preparation of temporary slide one should
(a) use needle to place the cover slip
(b) allow the slide to fall gently on the cover slip
(c) remove air bubbles using the brush
(d) none of the above
- 8) After staining onion peel for 2-3 minutes what will be the colour of the peel
a) colourless b) red c) blue d) yellow
- 9) Use of tooth pick in preparing temporary mount of cheek cell is
a) to scrap the inner lining of cheek
b) to place the cover slip
c) to remove the air bubble
d) none of the above
- 10) The stain used in preparing temporary mount of onion peel is
a) glycerine b) safranin c) water d) methylene blue
- 11) Which of the following organelle is visible in the temporary mount of onion peel
a) nucleus b) mitochondria c) golgi body d) lysosomes
- 12) Soham while observing an onion peel slide under the microscope noted the following characteristics.
a) Presence of a single nucleus in a cell
b) Cells attached edge to edge without any intercellular spaces
c) Presence of cell wall around each cell
d) All of these
- 13) Human cheek cell was stained, mounted and observed under the compound microscope. The components of the cell which would be seen are :-
a) Cell wall, nucleus and cytoplasm
b) Plasma membrane, cytoplasm, nucleus
c) Plasma membrane, nucleus, mitochondria
d) Cell wall, nucleus, vacuole
- 14) Use of brush in preparing temporary mount of onion peel is-
a) to paint the peel
b) to transfer the peel
c) to remove the air bubble
d) to clean the slide
- 15) Microscopic observation of onion peel shows nucleus at the periphery the reason for this is
a) large nucleus
b) large vacuole
c) lack of cytoplasm
d) improper staining

Endosmosis by raisins

1. Students A, B and C were given five raisins each of equal weight. The raisins were soaked in distilled water at room temperature. A removed the raisins after, 20 minutes, B after two hours and C after 40 minutes. If P_A , P_B & P_C denotes percentage absorption of water obtained by Students A, B and C respectively then,

- (a) $P_A > P_B > P_C$
- (b) $P_A < P_B < P_C$
- (c) $P_A < P_B > P_C$
- (d) $P_A = P_B = P_C$

2. A student dissolved 1 g of sugar in 10 mL of distilled water in a beaker A. He dissolved 10 g of sugar in 100 mL of distilled water in beaker B. Then he dropped a few raisins, in each. After two hours he found the raisins

- (a) Swollen in A and shrunken in B.
- (b) Shrunken in A and swollen in B.
- (c) Swollen in both.
- (d) Shrunken in both.

3. A student dissolved 5 g of sugar in 100 mL of distilled water in beaker A. She dissolved 100 g of sugar in 100 mL of distilled water in beaker B. Then she dropped a few raisins of equal weight in each beaker. After two hours she found the raisins in A swollen and those in B shrunken.

The inference drawn is that

- (a) Sugar concentration of raisins is lower than that of solution A and higher than that of solution B.
- (b) Sugar concentration of raisins is higher than that of solution A and lower than that of solution B.
- (c) In B the cell membrane of raisins was damaged resulting in leaching.
- (d) In A the permeability to water of the cell membrane of raisins was enhanced.

4. While performing an experiment with raisins, a student recorded the following data.

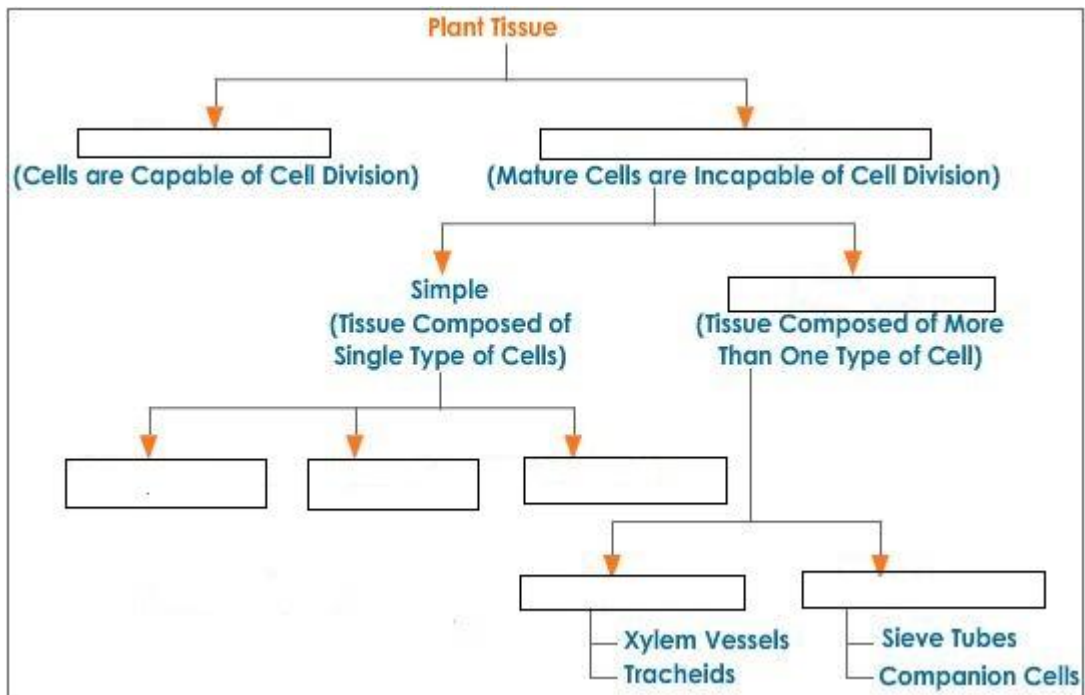
Mass of water taken in the beaker = 50 g
Mass of raisins before soaking = 20 g
Mass of raisins after soaking = 30 g
Mass of water in the beaker left after experiment = 40 g
The % of water absorbed by the raisin is

- (a) 10 %.
 - (b) 20 %.
 - (c) 45 %.
 - (d) 50 %
5. 5g of raisins were placed in distilled water for 24 hours. The weight of soaked raisins was found to be 7g. The correct percentage of water observed by raisins is
- a) 20 %
 - b) 25 %
 - c) 40 %
 - d) 45 %

Chapter 6**TISSUES****Assignment No. 6.1****Plant Tissues**

Q1. What is a tissue?

Q2. Complete the following:



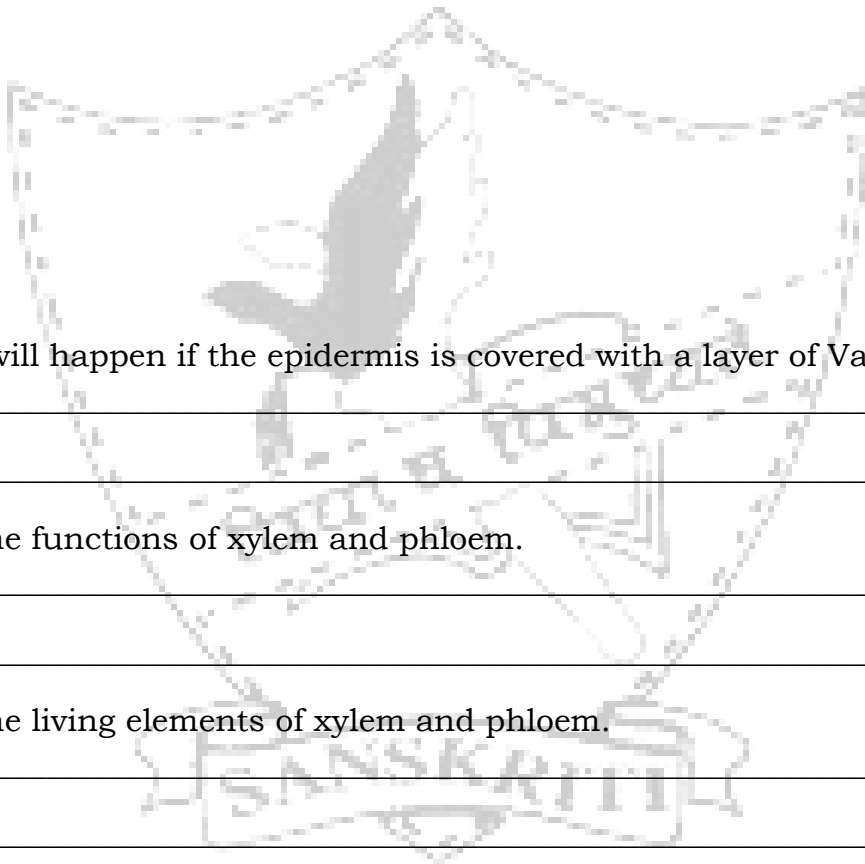
Q3. Name the Complex Permanent Tissue. Why are they called as complex tissues?

Q4. Give the various elements of Xylem and Phloem.

Q5. State true or false, if the statement is false correct it and rewrite the correct statement.

- (i) Tissue consisting of loosely packed cells with large intercellular spaces is parenchyma.
- (ii) Tissue consisting of regular thickening in the cells is Collenchyma.
- (iii) Chlorenchyma consists of large air cavities.
- (iv) Sclerenchyma consists of chlorophyll which makes it hard.
- (v) Small pores in the epidermis of leaf are called as stomata.
- (vi) Cork cells contain lignin.

Q6. Draw a well labelled diagram of stomata showing guard cells.



Q7. What will happen if the epidermis is covered with a layer of Vaseline?

Q8. Give the functions of xylem and phloem.

Q9. Name the living elements of xylem and phloem.

Chapter 6**TISSUES****Assignment No. 6.2****Animal Tissues**

Q1. Give reasons:

(i) Why is it essential for the oxygen to reach each and every cell of the body?

(ii) Matrix of bone is made up of calcium.

(iii) Presence of contractile protein in the muscles.

(iv) Why are unstriated muscles called so?

(v) Neurons are long cells.

(vi) Animals of colder region and fishes of cold water have thick layer of subcutaneous fat.

Q2. Complete the following:

Types of Animal Tissues →

Name

Location

Types of

Epithelial Tissues →

Q3. Give the functions and components of blood.

Q4. Differentiate between:

(i) Bone and Cartilage

(ii) Tendons and ligaments

(iii) Striated muscles and Cardiac muscles

(iv) Unstriated muscles and skeletal muscles.

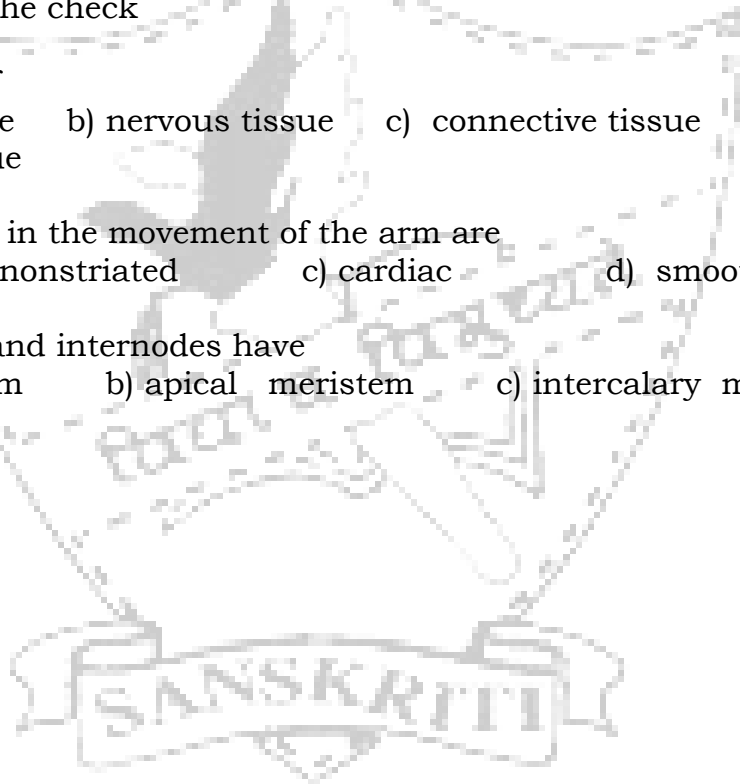
Q5. Give the function of axon and dendrite.

Q6. What is the role of Adipose tissues in our body?

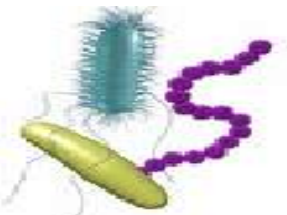
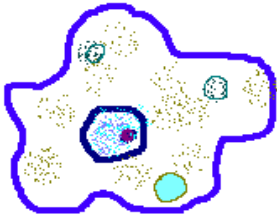

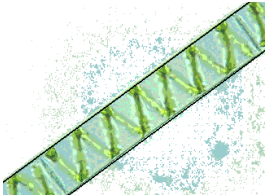
Multiple choice questions based on practical skills
Permanent slides

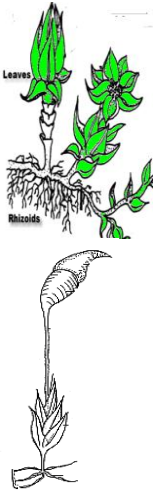

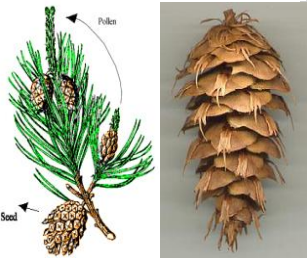

- 1) You are shown a slide of plant tissue with both parenchyma and collenchyma. You can identify the collenchyma by
 - a) Location of nucleus
 - b) Position of vacuole
 - c) Thickness of the cell wall
 - d) Size of cell
- 2) The permanent plant tissue which is living and thin walled is
 - a) Parenchyma
 - b) Sclerenchyma
 - c) Collenchyma
 - d) Xylem
- 3) Which of the following is the packing tissue of the plant?
 - a) Collenchyma
 - b) Parenchyma
 - c) Sclerenchyma
 - d) Phloem


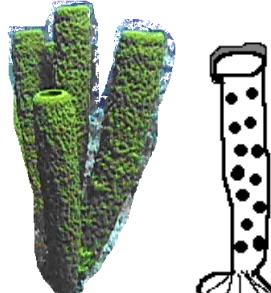
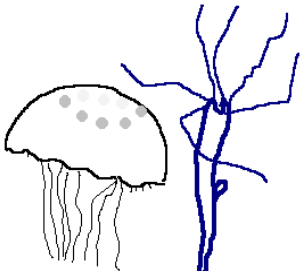
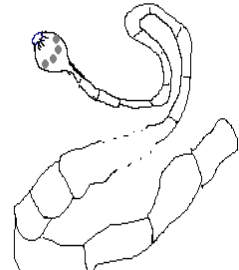

- 4) Striated muscles are called so because they have
- inconspicuous nucleus
 - alternate light and dark bands
 - light bands only
 - none of the above
- 5) Kusum observed nerve cells under the microscope, and labeled the sketch. The mistake in her labeling is
- Cilia
 - Dendrites
 - Nucleus
 - Cytoplasm
- 6) Continuously dividing tissues are called as
- meristmatic tissues
 - sclerenchyma
 - xylem
 - epithelial
- 7) Cuboidal epithelial cells are found in
- tongue
 - kidney tubules
 - stomach
 - inner lining of the cheek
- 8) Blood is a type of
- epithelial tissue
 - nervous tissue
 - connective tissue
 - muscular tissue
- 9) Muscles involved in the movement of the arm are
- striated
 - nonstriated
 - cardiac
 - smooth
- 10) Bases of leaves and internodes have
- lateral meristem
 - apical meristem
 - intercalary meristem
 - none

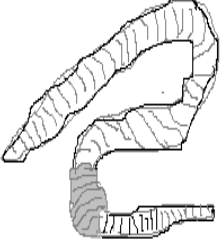






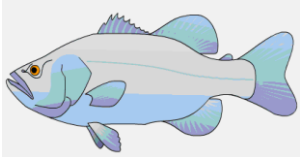



Chapter 7**DIVERSITY IN LIVING ORGANISMS****Diversity Chart**


S No.	Organism	Identify specimen	Kingdom & / Division / Phylum	Two Characteristics : Kingdom / & Division / Phylum / Class
1.				
2.				
3.				
4.	<p data-bbox="309 1563 576 1637">CRYPTOGAMAE (spores)</p> 			
5.	<p data-bbox="279 2016 544 2042">CRYPTOGAMAE</p>			

				
<p>6.</p>	<p>CRYPTOGAMAE</p> 			
<p>7.</p>	<p>PHANEROGAMAE (seed)</p> 			
<p>8.</p>	<p>PHANEROGAMAE</p> 			
<p>9.</p>	<p>PHANEROGAMAE</p>			

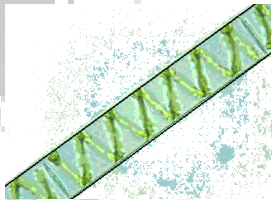
				
10.				
11.	<p>ACOELOMATE</p> 			
12.	<p>ACOELOMATE</p> 			
13.	<p>PSEUDOCOELOMATE</p> 			
14.	<p>COELOMATE- with</p>			

	<p>body cavity</p> 			
15.				
16.				
17.	<p>NO NOTOCHORD</p> 			

<p>18.</p>	<p>NOTOCHORD</p> 			
<p>19.</p>	<p>NOTOCHORD replaced by Vertebral column</p> 			
<p>20.</p>				
<p>21.</p>				
<p>22.</p>				

23.				
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Multiple choice questions based on Practical Skills
Specimens

- 1) The common feature that assigns Honey bee and Cockroach to the same phylum is:
 a) Wings
 b) Three pairs of legs
 c) Jointed appendages
 d) Antennae
- 2) The Amphibians of the plant kingdom are
 a) Bryophytes b) Gymnosperm c) Pteridophytes d) Angiosperm
- 3) Neha observed the following under the microscope. Identify the organism and the group
- 
- a) Fern; Pteridophytes b) Spirogyra; Algae
 c) Spirogyra; Fungi d) Moss; Bryophytes
- 4) Correct classification of Moss is:
- a) Kingdom : Plantae
 Sub Kingdom: Phanerogamae
 Division : Pteridophyta
 Class : Mosses
- b) Kingdom : Plantae
 Sub Kingdom: Cryptogamae
 Division : Pteridophyt
 Class : Mosses
- c) Kingdom : Planta
 Sub Kingdom: Cryptogamae
 Division :Bryophyta
 Class : Mosses
- d) Kingdom : Plantae
 Sub Kingdom : Cryptogamae
 Division : Thallophyta
 Class : Mosses

Chapter 13**WHY DO WE FALL ILL****Assignment : 13**

Q1 a. What is a disease?

b. Give common methods of transmission of diseases?

Q2. Differentiate between Infectious and Non-infectious diseases?

Q3. What are Infectious agents? Give example.

Q4. Give the infectious agents and their names of the following diseases:

a. Kala- azar.

b. Acne.

c. Sleeping sickness

d. Peptic ulcer.

Q5. What kind of disease will be called as chronic disease?

Q6. What is the effect of the following on our health :-

a. Acute disease.

b. Chronic disease.

c. Poor hygiene conditions.

Q7. What are Ulcers?

Q8. Give reasons for the following :

a. A drug will not work against microbes belonging to different groups.

b. Penicillin has different effect on Bacteria and Us?

c. If someone is suffering from cold and cough in the class, it is likely that the children sitting around will be exposed to the infection. But all of them do not actually suffer from the same.

c. Prevention is better than cure.

Q9. What are pathogens?

Q10. Give the common diseases caused by the following pathogens :

a. Virus.

b. Bacteria.

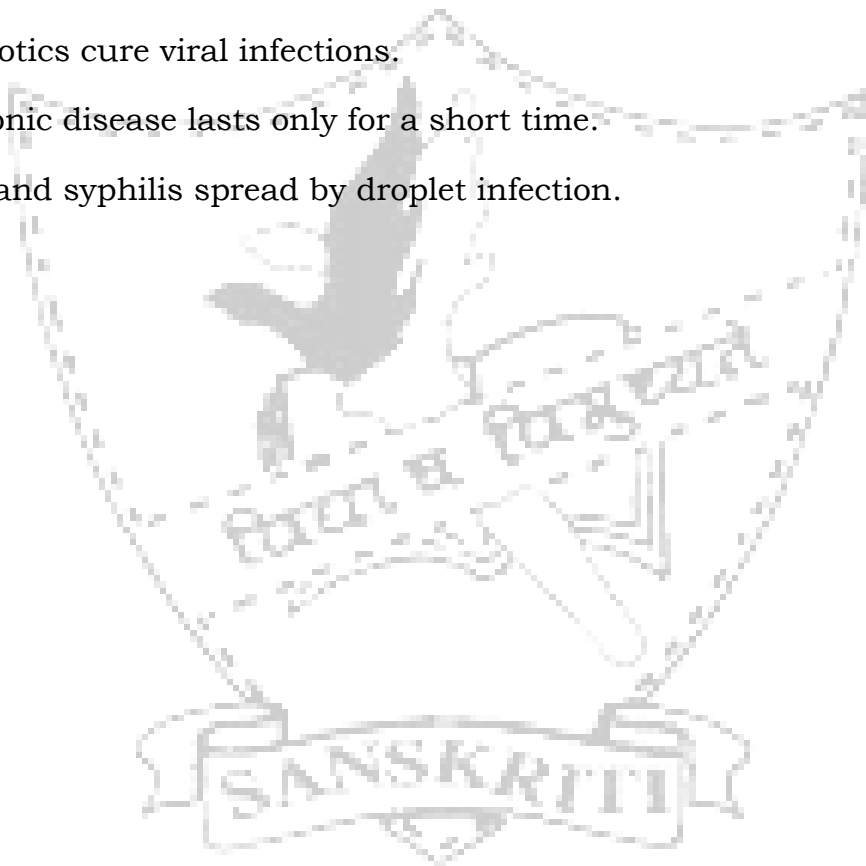
c. Protozoan.

d. Fungi

Q11. Write short notes on AIDS?

Q12. Mark the statements true or false:

- a) Unhygienic conditions breed germs.
- b) People of all ages need to do the same amount of exercise.
- c) Antibiotics cure viral infections.
- d) A chronic disease lasts only for a short time.
- e) AIDS and syphilis spread by droplet infection.



Chapter 14

NATURAL RESOURCES

Mineral riches in the soil

Biogeochemical Cycle

Assignment No. 14

Q1. What is soil? How is soil formed?

Q2. Life on earth will be affected if the top soil is removed. Justify.

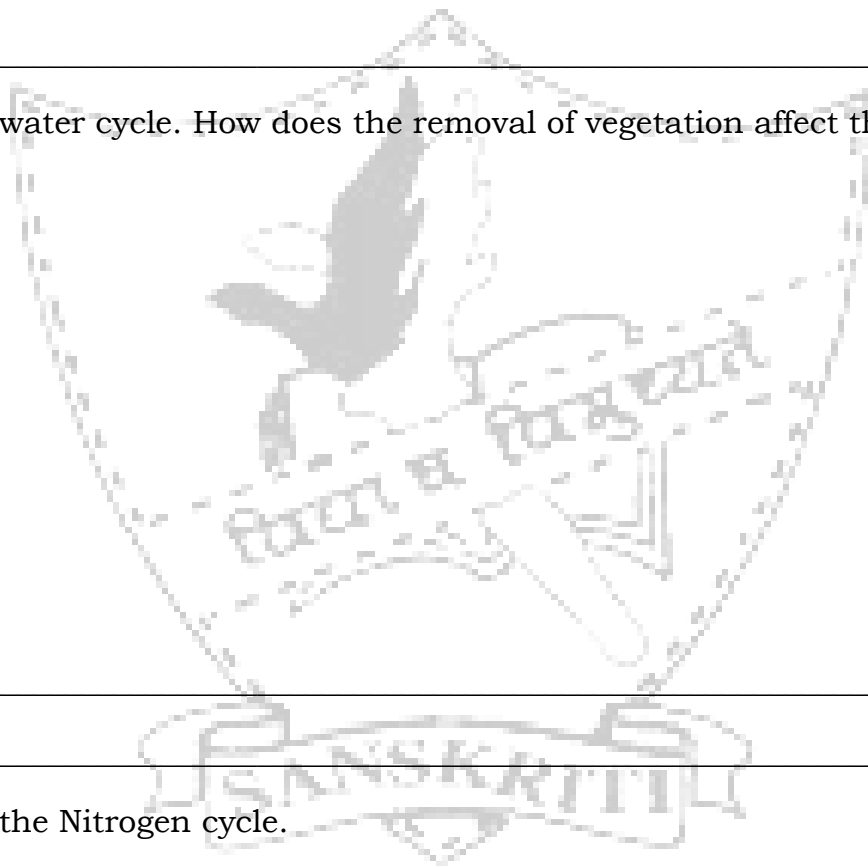
Q3. What are the causes of soil pollution?

Q4. Define soil erosion. How does soil erosion affect agriculture?

Q5. Give three ways by which soil erosion can be controlled.

Q6. What do you mean by Biogeochemical Cycle?

Q7. Draw water cycle. How does the removal of vegetation affect the water cycle?



Q8. Draw the Nitrogen cycle.

Q9. What are Nitrogen-fixing bacteria? Give examples.

Q10. What is Green House Effect?

Multiple choice questions

- 1) Living organisms that help in the formation of the soil are
a) Lichens b) Big trees c) Both the above d) None of the above
- 2) Humus
a) makes the soil porous
b) allows water and air to penetrate deep underground
c) allows only water to enter the soil
d) both a and b
- 3) Mineral nutrients found in a soil depends on
a) its parent rock b) only top soil c) only sub soil d) none of the above
- 4) Nutrients used by the organisms during their life cycle are returned to the environment this can be understood by
a) biogeochemical cycles b) soil erosion c) Photosynthesis d) all of the above
- 5) Harmful UV rays of the sun are absorbed by
a) carbon dioxide b) Ozone c) Oxygen d) helium
- 6) One of the important gases that is responsible for the green house effect is
a) CO₂ b) O₂ c) N₂ d) CO
- 7) Depletion of forests results in
a) less rainfall b) soil erosion c) loss of fertility d) all of the above
- 8) Air contains maximum percentage of
a) Nitrogen b) Oxygen c) Carbon dioxide d) Hydrogen
- 9) *Rhizobium* helps in
a) Biological Nitrogen Fixation b) Photosynthesis c) Rainfall d) Both b and c
- 10) Biosphere includes
a) Hydrosphere b) Lithosphere c) Atmosphere d) None of the above

Chapter 15**IMPROVEMENT IN FOOD RESOURCES****Assignment No. 15**

Q1. Why is it essential to include cereals, pulses and oil in our food?

Q2. Give two examples each of: cereals, pulses and oil seeds.

Q3. Name two crops that are used as food for the livestock.

Q4. Describe Kharif and Rabi crops. Give example of each of them.

Q5. What are the three steps that help in improving crop yields?

Q6. Name two methods for improving crop variety.

Q7. Scientists have worked on improvement in the seed quality. Name six such factors for which variety improvement has been achieved.

Q8. Differentiate between :
a) Fertilizers and Manures.

b) Mixed Cropping and Inter Cropping.

Q9. What is organic farming?

Q10. Mention the various ways by which irrigation is achieved in India.

Q11. What are weeds? Give example and explain why they are harmful?

Q12. Write the factors responsible for the spoilage of grains. How can these be controlled?

Q13. What is Animal Husbandry?

Q14. Give the advantage of cattle husbandry.

Q15. Name the cattle variety:

- a) useful for long lactation period
- b) resistance to diseases.

Q16. Give the food requirement of dairy animals.

Q17. Mention the cross breeding programme with respect to the Poultry farming.

Q18. What are Broiler chickens.

Multiple choice questions

- 1) Sustainable agriculture involves
a) Mixes Farming b) Crop rotation c) Both d) None
- 2) Pisciculture is

- a) Bee Keeping b) Fish Production c) Pearl culture
d) Broiler Production
- 3) Broilers are
a) Ornamental fishes b) Used for meat c) Dairy products
d) Used for Bee keeping
- 4) Sahiwal is a
a) Cattle breed b) Poultry breed c) Dairy product d) Fish
- 5) Weeds are
a) Herbs b) useful crops c) harmful d) both a and c
- 6) Selection of crop for rotation depends on
a) Moisture conditions b) Rainy season c) Both d) none
- 7) Legume crop is sown before a cereal crop to
a) Have two crops in an year b) improve the crop variety
c) to maintain soil fertility d) None of the above
- 8) Apiaries are
a) place to keep apes b) place to keep bees
c) place to keep any living organism d) all of the above
- 9) Aseel is an indigenous Fowl
a) True b) False c) it is an exotic breed
d) it is a type of fish
- 10) Pomphret is a marine fish
a) False b) True
c) Pomphret is actually found in fresh and marine water both
d) None of the above



Crossword Puzzle

Instructions:

- Solve the given puzzle with the help of clues provided and mark them at appropriate places inside the box.

V	E	R	M	I	C	O	M	P	O	S	T	I	N	G
O	F	I	R	Y	A	R	I	A	P	O	S	I	M	E
L	G	V	H	E	R	G	Y	R	A	F	Z	O	F	T
V	A	E	L	S	B	A	A	T	S	C	R	O	P	S
S	L	R	A	U	O	N	G	H	M	A	T	E	Y	U
B	G	L	I	M	N	I	L	E	L	S	Y	A	P	U
A	P	I	C	E	S	C	A	N	A	L	S	I	G	H
P	I	F	H	G	M	F	Q	I	P	U	Z	E	R	A
E	N	T	R	E	C	A	T	U	B	L	K	O	S	G
I	M	P	A	R	E	R	Y	M	R	I	G	A	L	S
B	A	R	K	L	O	M	B	S	O	P	U	S	G	M
F	M	L	W	R	T	I	P	A	T	E	S	E	T	A
G	U	R	K	D	I	N	V	U	D	A	L	E	H	T
R	E	P	R	T	A	G	U	R	N	S	I	L	C	E

CLUES:

1. Process of decomposition involving earthworm.(15)
2. Farming system with minimal or no use of chemicals. (14)
3. Indian variety of poultry. (5)
4. An example of weed. (10)
5. Water is drawn directly from rivers. (9)

**Value Based Questions
Practice Questions**

1. During a field-trip some students visited an agricultural farm and saw a few birds eating earthworms. They enjoyed the scene and then they also started picking and killing the earthworms for pleasure. The farmer strongly objected and asked them to leave the field.
 - What could be the reason behind such a behavior of the farmer?
 - What values do you find missing in the student's behavior?
 - Which phylum do earthworm belong to?
 - Write two identifying features of earthworm.

2. Anshul is having a beautiful pet dog 'Ginger'. One day, he observed a small insect between his toes. He removed it carefully from the toe and observed it curiously as chapter titled 'Diversity In Living Organisms' was being taught in the school.
 - Identify the phylum to which the insect belong to.
 - Enlist any two characteristic features of this phylum.
 - Comment on Anshul's behavior.

3. Radhey was suffering from respiratory disorder since long time. His daughter Sarita took him to a doctor. After studying his case, the doctor came to know that Radhey was residing near a very busy road.
 - What could be the possible reason for Radhey's respiratory disorder?
 - Which major pollutants are present in exhaust of vehicles?
 - Write the preventive measures that should be taken.

4. In a school assembly, the students were asked to wear full sleeves shirts, full pants and socks pulled till knees, use mosquitoes repellants cream during day time.
 - Name the disease, about which preventive instruction are given in the assembly.
 - Name the vector of this disease.
 - Give two preventive environmental measures.
 - Which two values were given in assembly related to society?

5. Ram Avatar is a farmer residing on the outskirts of Delhi. Upon a visit to a fertilizer shop, the salesmen inquired of Ram Avatar of the crop he anticipated to cultivate in the coming season. During the conversation, the crop concerned was conveyed. The salesman suggested that urea and other nitrogenous fertilizer be used. Shreshth, quietly but keenly listening the conversation intervened and told Ram Avatar that for the concerned crop nitrogenous fertilizers shall not be required. Respond to the following questions using the information provided above:
 - What values are shown by Shreshth?
 - What can be the concerned crop possibly?
 - What can be the reason for Shreshth's suggestion?

6. A priest of temple collected dried garlands, holy old books and some statues. He asked his son to throw in the river. But instead of throwing, he buried them in the soil.
 - In the situation above, who wins your support: the priest or the son? Justify your answer by giving two reasons.
 - What are the values reflected in the behavior of son?

SAMPLE PAPER
Subject- Science (Theory)
First Term (SA-I)
Class- IX
Set-1

Time- 3 hr

Max. Marks: 90

General instructions-

- 1 The question paper comprises of 2 sections A and B. You are to attempt both the sections.
- 2 All questions are compulsory.
- 3 There is no overall choice. However internal choice has been provided in all the questions of the five marks category. Only one option in such questions is to be attempted.
- 4 All questions of Section A and all questions of Section B are to be attempted separately.
- 5 Questions 1 to 3 are 1mark questions to be answered in one word or one sentence.
- 6 Q 4-7 are 2mark questions to be answered in about 30 words.
- 7 Q 8- 19 are three mark questions to be answered in about 50 words.
- 8 Q 20-24 are five mark questions to be answered in about 70 words.
- 9 Q 25-42 are in Section B are multiple Choice questions based on Practical skills. Each question is a one mark question. You are to choose the most appropriate response out of the four provided to you. In your answer only write the correct option and NOT the complete answer.

This paper has 8 printed sides and 42 questions.

SECTION A

- 1 Arrange the following on the basis of their particle size(descending order)- (1)
Milk, solution of potassium permanganate, sand and water.
- 2 A father has mass of 80 kg and the mass of his son is 40 kg. What will be (1)
the ratio of the inertia of the father to the inertia of his child?
- 3 What is the function of the cell wall?(any one) (1)
- 4 Classify the following as types of changes- (2)
 - a) Turning milk into curd
 - b) Kneading flour into a dough
 - c) Mixing sand and salt
 - d) Heating iron and sulphur

- 5 A sheet of paper and a crumpled paper are dropped from the same height and time is noted. Which one will take the more time to reach the bottom of the container and why? (2)
- 6 (a) What is the role of stomata in plants? (2)
(b) Differentiate between aerenchyma and chlorenchyma.
- 7 List any two membrane bound organelles. Write any one difference between them. (2)
- 8 Give reasons for the following- (3)
a) Perfume bottle if left open, the smell fills the room.
b) Common salt is compound.
c) Evaporation is a surface phenomenon.
- 9 a) Define 'latent heat of fusion'. (3)
b) Why does the temperature remain constant when a substance melts?
- 10 From the velocity-time graph of uniformly accelerated motion, establish the second equation of motion. (3)
- 11 State Newton's third law of motion. Are the forces mentioned in the law balanced forces? Why? Will they always produce accelerations of equal magnitude? Why? (3)
- 12 (a) When you jump on a concrete surface, your feet hurt more than you jump on sand. Give reasons. (3)
(b) From a rifle of mass 4 kg, a bullet of mass 50 g is fired with an initial velocity of 35 m/s. Calculate the recoil velocity of the rifle.
- 13 (a) What happens to force between two objects if the distance between the object is tripled and the masses of both objects are doubled? (3)
(b) Write two differences between the mass of an object and its weight.
- 14 (a) What is free fall? Give an expression for the acceleration due to gravity. (3)
(b) What happens to the value of 'g' as we go (i) to higher altitude
(ii) deep inside the earth.
- 15 (a) What are two ways by which fish are gathered on a commercial scale? (3)
(b) What is the major problem faced in fish farming? How can it be overcome?

- 16 Name the following: (3)
- (a) Connective tissue that stores fat in our body.
 - (b) Connective tissue that connects bone to bone.
 - (c) Muscular tissue present in the heart.
 - (d) Connective tissue with matrix made up of calcium and phosphorous.
 - (e) Epithelial tissue found in the lining of kidney tubule.
 - (f) Epithelial tissue with cilia.
- 17 (a) Draw a neat diagram of an animal cell and label the following parts - (3)
Power house of the cell, , suicide bag
(b) What will happen when this cell is placed in a very dilute sugar solution and why?
- 18 (a) Differentiate between fertilizers and manures.(Any two) (3)
(b) What is organic farming?
- 19 (a) Differentiate between xylem and phloem on the basis of their function. (3)
(b) Write the location and function of apical meristem.
- 20 a) What is 'solubility of a solute'? (5)
b) What would happen to the solubility of a solute on heating the solution?
c) When solution is called saturated?
d) To make a solution, 72g of sodium chloride is dissolved in 200g of water at 293K. Calculate its mass percentage at this temperature.
- OR
- a) Differentiate between compounds and mixtures.
 - b) Kerosene and petrol can be separated by distillation while air can be separated by fractional distillation. Explain this observation.
 - c) How will you separate a mixture containing chalk powder, sodium chloride and iron filings?
- 21 a) Differentiate between the three states of matter on the basis of (5)
density, rate of diffusion, interparticle spaces and kinetic energy of particles.
b) Write an activity to show that interparticle spaces increase with temperature.

OR

Differentiate between-

- a) gas and vapour
- b) Boiling and evaporation

State the factors on which rate of evaporation depends.

- 22 (a) The velocity of a body in motion is recorded every second (5)

Time(s)	0	1	2	3	4	5	6	7	8
Velocity (m/s)	48	42	36	30	24	18	12	6	0

Plot v-t graph and Calculate

- i) Acceleration
- ii) Distance covered by the body between $t=2s$ to $t=7s$ from the graph.

- (b) Write two physical quantities which possess same units.

OR

A body moves with a velocity of $2m/s$ for $5s$, and then its velocity increases uniformly to $10 m/s$ in next $5s$. Thereafter its velocity begins to decrease at a uniform rate until it comes to rest after $5s$.

- (i) Plot a velocity-time graph for the motion of the body.
- (ii) From the graph find the total distance covered by the body after $2s$ and $12s$.

- 23 a) Show that the Newton's first law of motion is contained in the second law of motion. (5)

b) State the law of Conservation of momentum. Prove this law for a head on collision of two balls, using the laws of motion.

OR

a) State Newton's second law of motion. Apply this law to obtain the unit of force and define it.

b) A stone of $1 kg$ is thrown with a velocity of $2 m/s$ across the frozen surface of a lake and comes to rest after traveling a distance of $50m$. What is the force of friction between the stone and the ice?

- 24 (a) Name two macro-nutrients and two micro-nutrients. (5)

(b) Mention two preventive measures to control loss of grains during storage.

(c) What is pasturage?

OR

(a) Explain mixed cropping method with the help of an example. Give any one advantage of using such a method.

(b) Name any two fodder crops which are raised as food for livestock.

(c) What is hybridization?

SECTION B

- 25 A mixture contains sand, common salt and camphor. The substance/s which get(s) separated by sublimation is/are- (1)
- Sand and camphor
 - Common salt only
 - Camphor only
 - Common salt and camphor
- 26 A student by mistake mixed iron filings and sulphur powder. He wanted to separate them. The method you would advise him to use is to dissolve the mixture in- (1)
- Boiling water
 - Cold water
 - Carbon disulphide
 - Alcohol
- 27 Which of the following will form a colloid? (1)
- Water-soap
 - Water-sand
 - Water-sugar
 - Water-salt
- 28 An iron nail was kept in copper sulphate solution for sometime. The colour changes from- (1)
- Blue to light green
 - Light green to blue
 - Blue to red
 - Red to blue
- 29 On burning magnesium ribbon, a white ash is obtained the solution of which turns red litmus blue. The white ash is- (1)
- Magnesium hydroxide and basic in nature
 - Magnesium oxide and acidic in nature
 - Magnesium oxide and basic in nature
 - Magnesium chloride and acidic in nature

- 30 Observe the following observation table of determination of boiling point of water. (1)

Time(min.)	Temp.(°C)
0	27
1	42
2	56
3	71
4	86
5	95
6	98.5
7	99
8	99

The boiling point of the given sample is-

- a) 95°C
b) 99°C
c) 98.5°C
d) 98.8°C
- 31 A student added dilute hydrochloric acid to granulated zinc in a test tube. He observed that - (1)
- a) The gas formed had a smell of rotten eggs
b) Brown fumes were formed
c) The gas burnt with a dazzling flame
d) The gas burns with a pop sound
- 32 A test tube contains a mixture of copper sulphate and water. By observing the sample, a student concludes- (1)
- a) Mixture is homogeneous and leaves no residue on filtration
b) Mixture is homogeneous and copper sulphate is left behind on the filter paper
c) Mixture appears heterogeneous but cannot be filtered
d) Mixture is heterogeneous and copper sulphate can be filtered
- 33 What is the colour of the precipitate obtained when sodium sulphate solution is added to barium chloride solution? (1)
- a) Red
b) Black
c) Blue
d) White
- 34 Which of these is/are a chemical change? (1)

- a) Mixing iron and sulphur
b) Heating lead nitrate
c) Mixing ammonium chloride and common salt
d) Adding water to common salt
- 35 Whenever two bodies interact, action and reaction act on (1)
(a) the same body
(b) different bodies
(c) no force is experienced by either of the body
(d) net force is zero.
- 36 In an experiment "to study the third law of motion using two spring (1)
balance" a student used a pan of 40 g mass and put weights 160g from
weight box in the pan. The reading shown by each of the two balances is
(a) 200 g
(b) 100 g
(c) 120 g
(d) 60 g.
- 37 Plant tissue which provides mechanical strength and consists of dead cells (1)
is
(a) parenchyma
(b) aerenchyma
(c) collenchyma
(d) sclerenchyma
- 38 20 gm of raisins were soaked in 40ml of water. Volume of water after (1)
absorption was 30ml and the weight of raisins was 30gm. The % of water
absorbed by raisins was
(a) 100%
(b) 50%
(c) 25%
(d) 75%
- 39 The correct order of the parts of a nerve cell through which nerve impulse (1)
is transmitted starting from dendrites
(a) Dendrites, nerve endings, axon, cell body
(b) dendrites, cell body, axon, nerve endings
(c) dendrites, nerve endings, cell body, axon
(d) dendrites, cell body, axon, nerve endings
- 40 Seema on adding a solution "X" to rice extract observed the conversion of (1)
colour of solution to bluish black. Identify "X"

- (a) bromine solution
 - (b) iodine solution
 - (c) distilled water
 - (d) salt solution
- 41 Seema bought arhar dal from the market. On adding water to the dal the water became yellow in colour. To this she added a few drops of HCl. The sample became pink. This confirmed that the adulterant to the dal was. (1)
- (a) Turmeric
 - (b) Metanil yellow
 - (c) Potassium dichromate
 - (d) Yellow dye
- 42 Animal cells are commonly stained with (1)
- (a) Methylene blue
 - (b) Acetocarmine
 - (c) Safranin
 - (d) Iodine solution



16. What is meant by reverberation? Suggest two ways of reducing reverberation. Why is the reverberation time larger for an empty hall than for a crowded hall? 3
17. State three modifications in Dalton's atomic theory. 3
18. a) Write the chemical formula of ammonium chloride. 3
- b) Calculate its formula mass. (Atomic mass of nitrogen=14u, hydrogen=1u and chlorine=35.5u).
- c) How many moles are there in 64.5g of ammonium chloride?
19. You must have observed the following animals in your surrounding environment or in a zoo. 3
Mention the class to which they belong and give one characteristic feature of the class mentioned.
- a) Frog
b) Lizard
c) *Scoliodon*
20. Explain the principle of immunization. Name any four diseases for which vaccines are available in the market. 3
21. A. Give one point of difference between the following: 2
- a) Acute and chronic diseases.
b) Communicable and non communicable diseases. 1
- B. Explain how antibiotics help in treating bacterial diseases.
22. What is inflammation? Give any two local effects of inflammation on human body. 3
23. Define kinetic energy. Derive an expression for kinetic energy of an object of mass 'm' and moving with a velocity 'v'? 5

What is the work to be done to increase the velocity of a car from 36 km/h to 54 km/h if the mass of the car is 1000 kg.

OR

Prove that the energy remains constant in case of a freely falling body.

What is the commercial unit of energy?

An electric bulb of 60 W is used for 6 hours per day. How many units of energy is consumed in one day by the bulb?

24. (i) How many valence electrons are there in a chloride ion? (atomic mass of chlorine=17) 5
What is the maximum number of electrons that can be accommodated in the shell-L?

Arun wrote the configuration of Calcium as

K	L	M
2	8	10

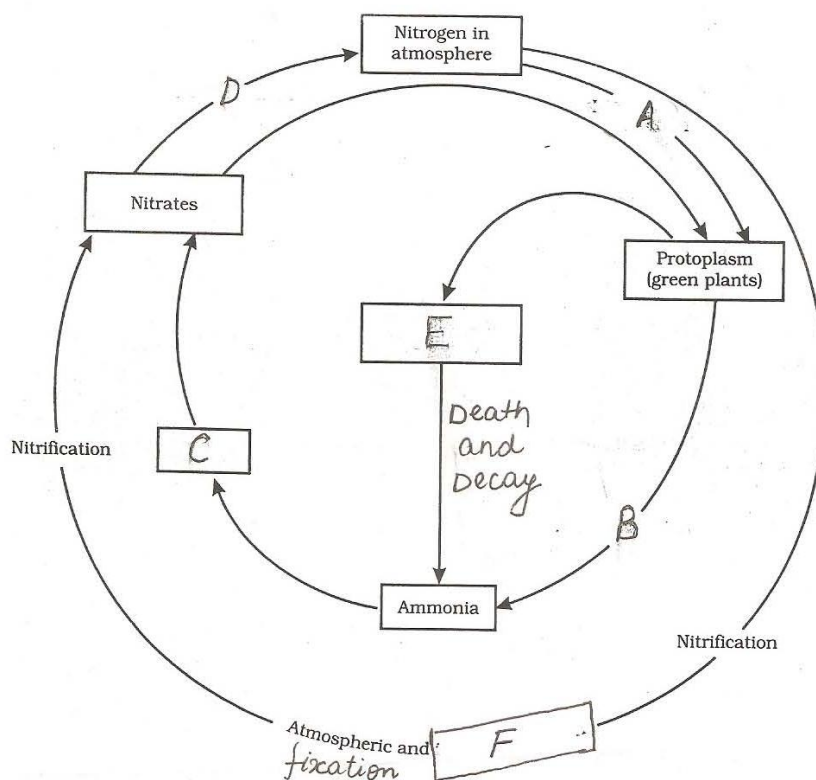
What is wrong with this representation?

- (ii) Illustrate the postulates of Neil Bohr's model of an atom.

OR

Give reason for the following-

- a) Isotopes of an element are chemically similar
 - b) An atom is electrically neutral
 - c) Noble gases show least reactivity
 - d) Nucleus of an atom is heavy and positively charged.
 - e) Ions are more stable than atoms.
25. Observe the given diagram and answer the questions that follow: 5



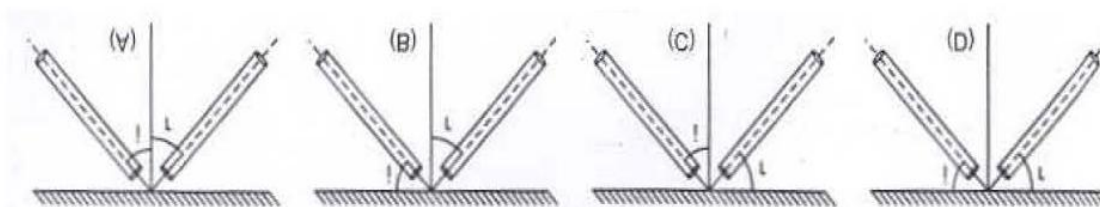
- a) Fill in the blanks A to F.
- b) Give two examples of nitrogen rich biologically important compounds.
- c) Organisms play an important role in nitrogen fixation. Explain.

OR

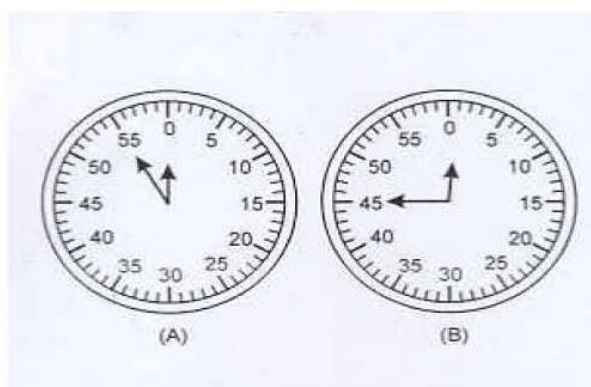
- a) Draw the oxygen cycle in nature.
 b) Can elemental oxygen be poisonous to some forms of life? Support your answer with a suitable explanation.

Section B

26. In an experiment to observe and compare the pressure exerted by a solid iron cuboid on sand, a student used an iron cuboid of dimension $10\text{ m} \times 6\text{ m} \times 4\text{ m}$. The weight of cuboid is 960 N . Then the values of minimum and maximum pressure exerted by cuboid on sand are
- (a) 0.016 Pa , 0.004 Pa (b) 16 Pa , 40 Pa
 (c) 160 Pa , 400 Pa (d) 1600 Pa , 4000 Pa
27. While doing the experiment of verification of law of reflection of sound, four students A, B, C and D measured the angles i and r as shown in the diagram. The correct measurement of angle of incidence and angle of reflection has been done by which student?

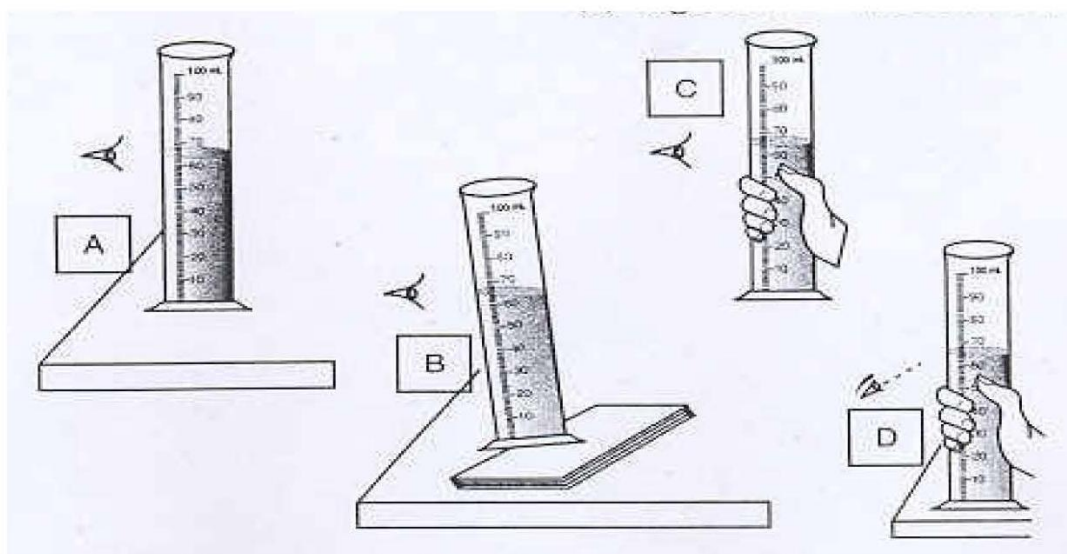


- (a) A (b) B
 (c) C (d) D
28. A slinky is stretched 2 m and a pulse of longitudinal waves is created. As the pulse starts, the stop watch is started from position shown in figure A and is stopped in position as shown in figure B when the pulse has traveled back to the starting point. The velocity of propagation of pulse along the string is



- (a) 4 cm/s (b) 4.4 cm/s
 (c) 8 cm/s (d) 8.8 cm/s

29. An empty tin container with its mouth closed has density equal to that of liquid A. The container is taken just below the surface of liquid A and is then left there. The container
- will bounce back to the surface
 - remains where it is left
 - sinks further
 - either (b) or (c)
30. Which is the correct way of reading the level of the liquid in a measuring cylinder shown in the figure below:-



- A
 - B
 - C
 - D
31. Heating of lead nitrate is an example of-
- Combination reaction
 - Displacement reaction
 - Double displacement reaction
 - Decomposition reaction
32. In an experiment, barium chloride and sodium sulphate were made to react. The precipitate obtained is of-
- Sodium chloride and white in colour
 - Barium chloride and yellow in colour
 - Barium sulphate and white in colour
 - Sodium chloride and red in colour
33. A mixture of ammonium chloride and common salt is heated in a china dish with an inverted funnel on top with cotton plug. After the experiment, ammonium chloride will be-
- In the china dish
 - In the inverted funnel

- c) In both the china dish and the funnel
d) Nowhere because it has decomposed
34. When magnesium ribbon is burnt, 1
- a) A dazzling white flame is observed
b) Reddish brown fumes are seen
c) Hydrogen gas is released
d) An acidic oxide is formed
35. Which of the following is true for the hydrogen gas released when an acid is added to zinc metal- 1
- a) It is colourless and basic
b) It is combustible and basic
c) It is combustible and neutral
d) It is odourless and acidic
36. *Agaricus* is commonly called as 1
- a) bread mould
b) black mould
c) mushroom
d) bracket fungi
37. Leaves of dicotyledonous plants show 1
- a) reticulate venation
b) parallel venation
c) needle shaped leaves
d) None of the above.
38. Identify the specimen on the basis of the following characteristics: 1
Cylindrical elongated body, Metameric segmentation, Cutaneous respiration.
- a) Earthworm
b) Cockroach
c) *Spirogyra*
d) Pigeon
39. The forelimbs of birds are modified for: 1
- a) Walking
b) Flying
c) Swimming
d) Perching

- 40 Out of the following which is not a characteristic feature of phylum Arthropoda 1
- a) Jointed appendages
 - b) Compound eyes
 - c) Hollow bones
 - d) Chitinous exoskeleton
41. True roots are absent in 1
- a) Bryophytes
 - b) Gymnosperms
 - c) Pteridophytes
 - d) Angiosperms