SMART SKILLS

SYLLABUS 2017-2018

BIOLOGY

INDEX

SYLLABUS

FIRST TERM

March 2017

- Life Processes : Nutrition

April 2017

- Life Processes : Respiration and Transportation
- Practicals:
  - To prepare a temporary mount of a leaf peel for stomata.
  - To show experimentally that light is necessary for photosynthesis.

May 2017

- Life Processes : Excretion.
- Practicals:
  - To show experimentally that carbon dioxide is given out during respiration.

July 2017

- Control and Coordination.
- Practicals:
  - To study homologous and analogous organs in plants and animals.
  - To study the various parts of a dicot seed.

August 2017

- Our environment.
- Practicals:
  - To study (a) Binary fission in *Amoeba* (b) Budding in Yeast with the help of prepared slides.
- First term exams.

SECOND TERM

September 2017

- How do organisms reproduce?

October 2017

- Heredity and Evolution

November 2017

- Heredity and Evolution (contd.) and Management of Natural Resources.

December 2017

- Second term exams

January 2018

- Pre- Board exams

Chapter 11

LIFE PROCESSES: Nutrition

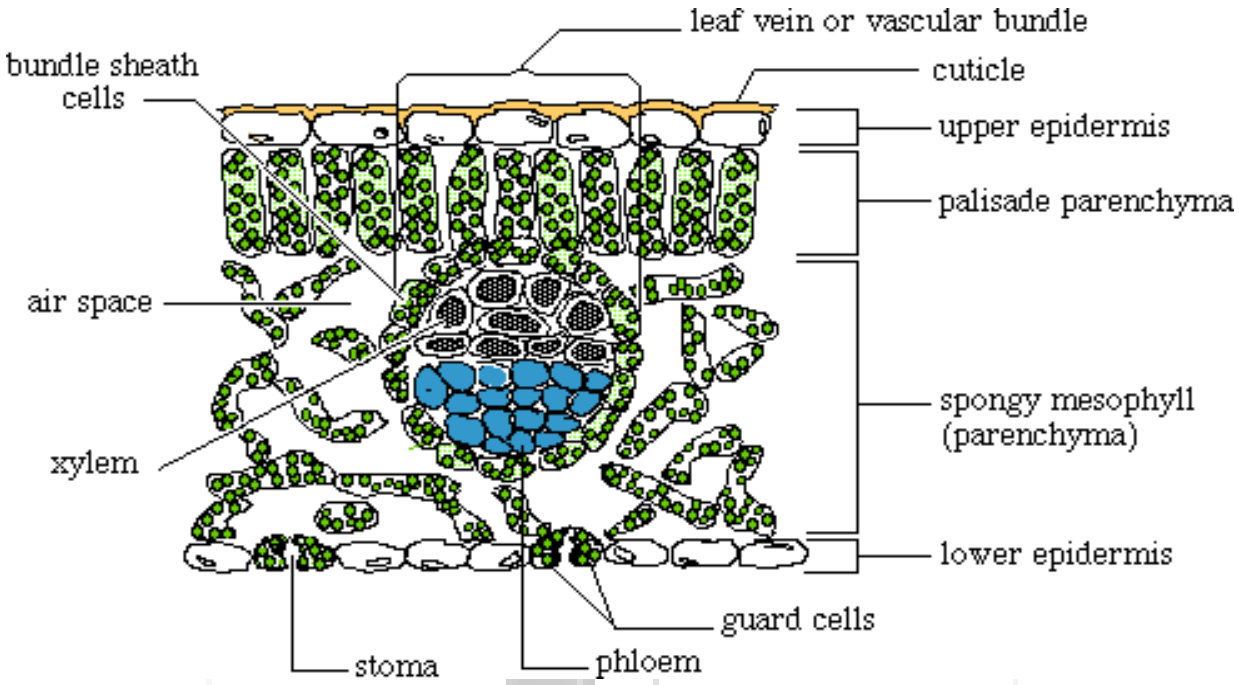
Nutrition in plants

1. Differentiate between autotrophic and heterotrophic modes of nutrition with examples.

2. Define and write the equation for photosynthesis.

3. List the events occurring during the process of photosynthesis.

4. If the surfaces of leaves are smeared with Vaseline, will it affect photosynthesis? Why?



5. Identify the diagram given above and answer the following question—

a) Why it is that most of the stomata are present on the lower epidermis.

b) Name the parts of mesophyll. What are the types of cells found in each?

c) Give the function of stomata.

6. In desert plants stomata are closed during the day. How do they get CO_2 for photosynthesis?

7. State two functions of stomata. How do guard cells regulate the opening and closing of stomata?

8. Mention the raw material required for photosynthesis.

9. When do the desert plants take up carbon dioxide and perform photosynthesis?

Chapter 11

LIFE PROCESSES: Nutrition

Nutrition in Animals

1. Name the mode of nutrition seen in *Amoeba* & Humans. _____
2. Name the 5 steps involved in it. _____, _____, _____, _____& _____
3. Draw & label to show the stages of phagocytosis in *Amoeba*.

4. In human beings digestion begins in the mouth. Justify.

_____

_____

_____

5. Herbivores have longer intestine than carnivore. Explain.

6. **Three common features** are necessary in all surfaces through which **absorption occurs**. State the features and also indicate the structure in the digestive system where absorption occurs.

7. Name the enzymes and their secretions along with their functions produced in the following parts of the alimentary canal

   a) Mouth

   b) Stomach

   c) Small intestine

8. How would digestion of food be affected if:
   a) Bile duct is completely blocked.

   b) No HCl is secreted in our stomach

   c) Blockage in the pancreatic duct

9. What is the action of amylase on food?

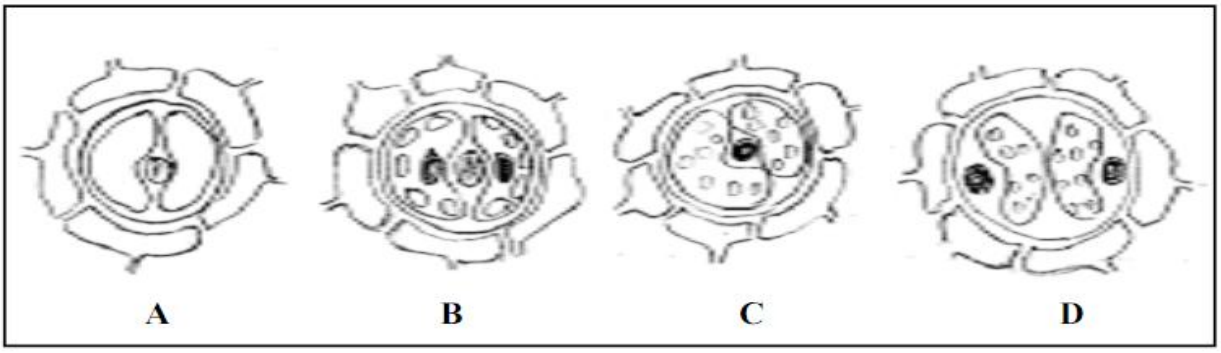
10. Name the end products of digestion of complex carbohydrates, fats and proteins.

11. What are biological catalysts?

12. What is emulsification of fats?

MCQs: Nutrition

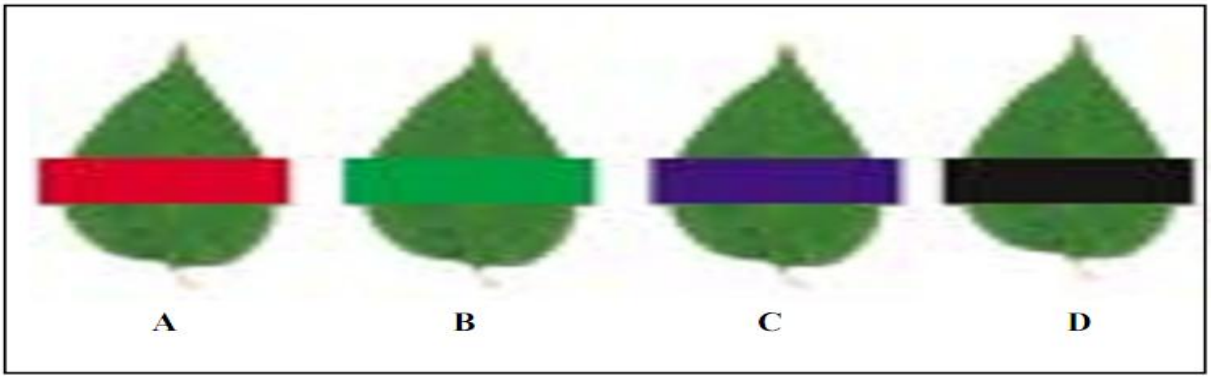
1. Students observed the epidermal peel of a leaf under the high power of a microscope. The following are the sketches made by them.



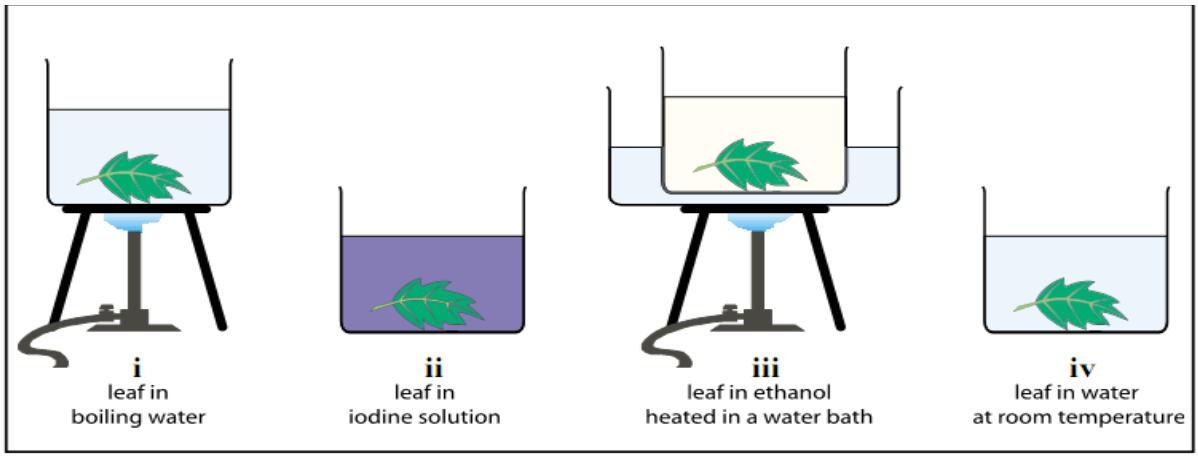
The correct sketch is
(a) A.
(b) B.
(c) C.
(d) D.

2. In an experiment on photosynthesis, students were instructed to cover a portion of a leaf of a de-starched potted plant with opaque paper as shown in the figure. "A" covered one of the leaves with red strip, "B" with green, "C" with blue and "D" with black. When the starch test was done on the leaves after 4 hours, the result showed no starch in

(a) The portion covered with red, green and blue strips.
(b) The portion covered with green strip.
(c) The portion covered with black and blue strips.
(d) Any of the covered portions.



3. A student performed the starch test on a leaf. Some steps involved are shown below.



The correct sequence of steps should be
(a) iv; iii; ii; i. (b) i; ii; iii; iv. (c) ii; iii; iv; i. (d) i; iii; iv; ii .

4. A part of de-starched leaf of a potted plant was covered with black paper strips on both sides and the plant was kept in sunlight for 8 hours. The leaf was then tested with iodine after boiling it in alcohol. Only the uncovered part of the leaf turned blue black. The inference is that

   (a) CO_2 is necessary for photosynthesis.
   (b) Light is necessary for photosynthesis.
   (c) Chlorophyll is necessary for photosynthesis.
   (d) Water is necessary for photosynthesis.

5. When students observed a stained epidermal peel of a leaf under the microscope, it appeared pinkish red. The stain used was
   (a) Iodine.
   (b) Acetocarmine.
   (c) Safranin.
   (d) Colchicin.

6. The correct procedure to prepare a temporary mount of a stained leaf epidermis is

A	B	C	D
Take a peel of a leaf Stain it with safranin; Transfer the peel to the slide; Remove the excess stain; Put a cover slip on it.	Take a peel of a leaf; Wash it in water; Place it on the slide; Add a drop of glycerin on it; Put a cover slip gently.	Stain the leaf; Take a peel; Wash the peel in water; Place it on a slide; Put a cover slip on it.	Take a peel; Stain it with iodine; Transfer the peel to the slide; Remove excess stain with blotting paper; Put a cover slip on it.

(a) A. (b) B. (c) C. (d) D.

7. A student covered a leaf from a destarched plant with a black paper strip and kept it in the garden outside his house in fresh air. In the evening, he tested the covered portion of the leaf for presence of starch. The student was trying to show that

   a. CO_2 is given out during respiration
   b. CO_2 is necessary for photosynthesis
   c. Chlorophyll is necessary for photosynthesis
   d. Light is necessary for photosynthesis

8. The best results for the experiment, that light is necessary for photosynthesis, would be yielded by using leaves from a plant kept for over twenty four hours

   a) In a pitch dark room
   b) In a dark room with the table lamp switched on.
   c) Outside in the garden
   d) Outside in the garden, covered by a glass case.

9. The correct sequence, out of the following options, for focusing a slide of epidermal peel of a leaf under a microscope to show the stomatal apparatus is

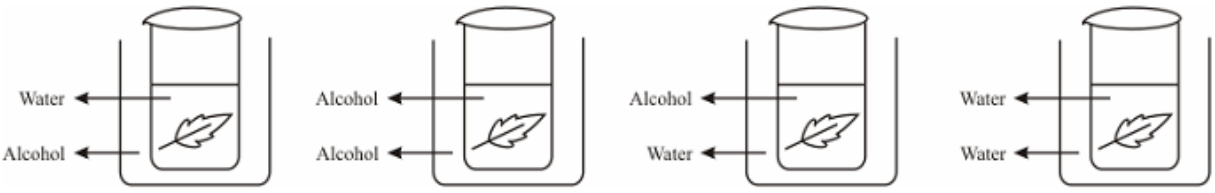
   a) Observe under low power.
   b) Adjust mirror to get maximum light.
   c) Place the slide on the stage.
   d) Focus under high power

   1. b, c, a, d 2. a, b, c, d 3. c, b, d, a 4. d, c, b, a

10. The part of leaf commonly used for preparing the slide of stomata is
    a. leaf margin
    b. leaf apex
    c. leaf epidermis
    d. leaf petiole

11. A student wanted to decolourise a leaf. He should boil the leaf in
    a) alcohol b) water c) KOH solution d) glycerine

12. The figures given below illustrate boiling of leaf to remove chlorophyll. This is one of the steps in the experiment to show that light is necessary for photosynthesis

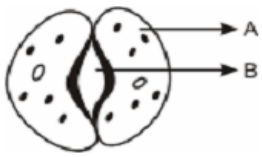


(I) (II) (III) (IV)

The correct method is

a) I b) II c) III d) IV

13. The parts shown as A and B in the given diagram are



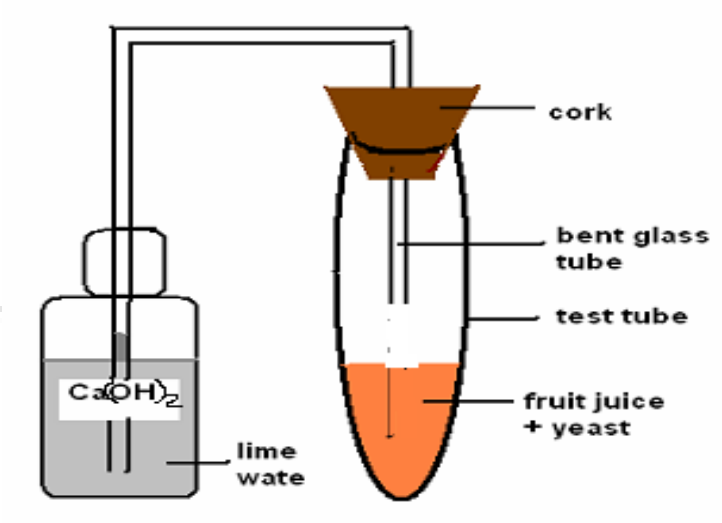
a. A is epidermal cell, B is stomatal pore
b. A is guard cell, B is stomatal pore
c. A is epidermal cell, B is guard cell
d. A is guard cells, B is epidermal cell

Chapter 11

LIFE PROCESSES

Respiration

1.



Answer the following questions for the above experimental setup.

a) What changes will be observed?

_____

_____

b) Will there be a change in the taste of the fruit juice?

_____

_____

c) Name the process that takes place in the test tube.

_____

_____

2.

Point of difference	BREATHING	RESPIRATION
1. Type of process 2. Energy released 3. Location (cell) 4. Enzymes needed		

3. In plants CO_2 emission is not observed at daytime, but Respiration takes place at all the times. Justify.

4. Why is the rate of breathing in fish higher than the terrestrial animals?

5. What is the role of ribs and diaphragm in exchange of gases? Give the role of rings of cartilage present in the throat.

6. List the three common features seen in all respiratory organs (absorbing surfaces).

7. What happens to the air after it reaches the lungs?

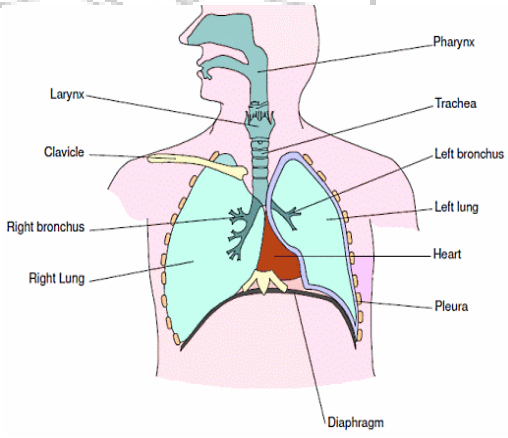
8. Give reasons for the following

a) Nasal cavity is lined with fine hair & sticky mucous

b) Epiglottis closes the mouth of the glottis.

c) Majority of CO_2 is carried by the plasma but not O_2.

9. Observe the diagram of Human Respiratory System and draw the structure that helps in the exchange of gases.



10. Why do the walls of the trachea not collapse when there is less air in it?

_____

_____

11. List three characteristics of lungs which make it an efficient respiratory surface.

_____

_____

_____

_____

12. How is alveoli designed to maximize the exchange of gases?

_____

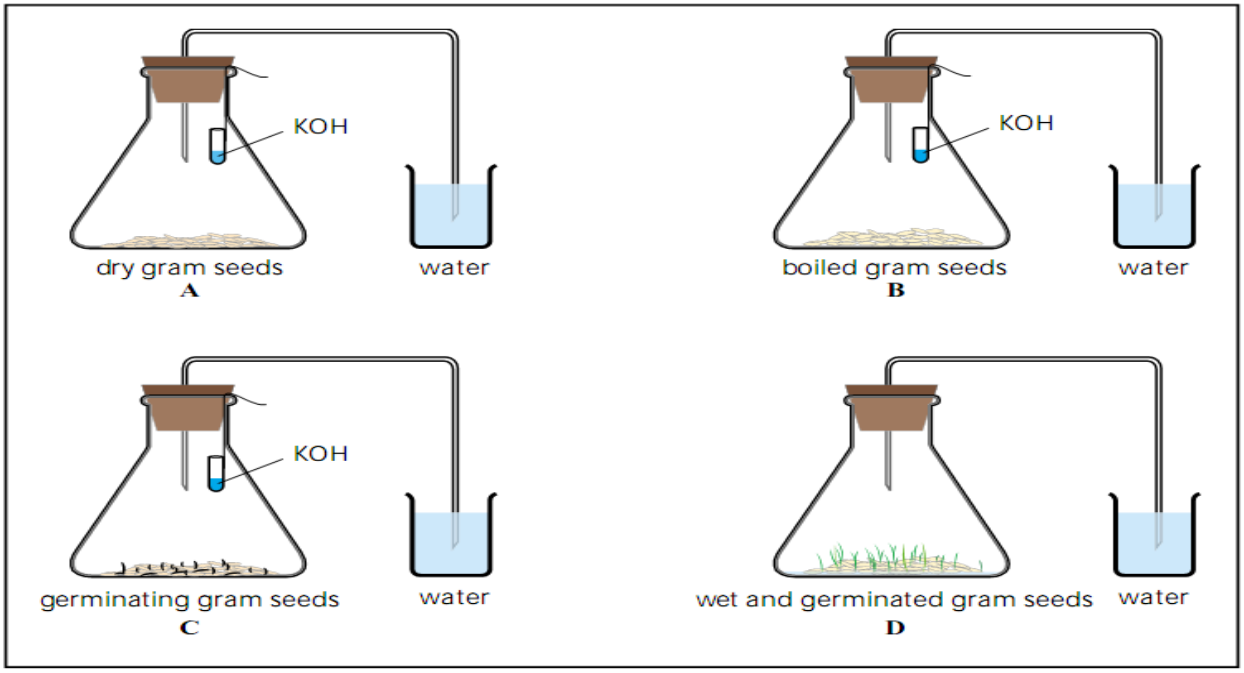
_____

_____

_____

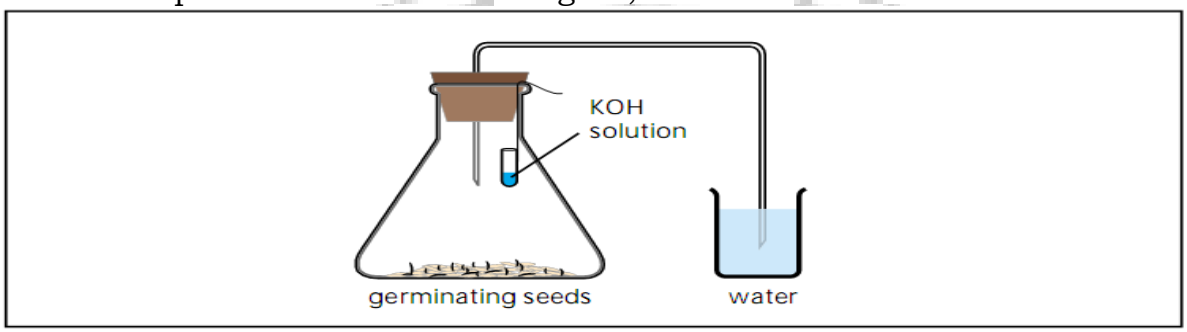
MCQ's: Respiration

1. Given below are four different set ups to show that CO2 is released during respiration.



The set up that will give the desired result is
(a)A.
(b)B.
(c)C.
(d)D.

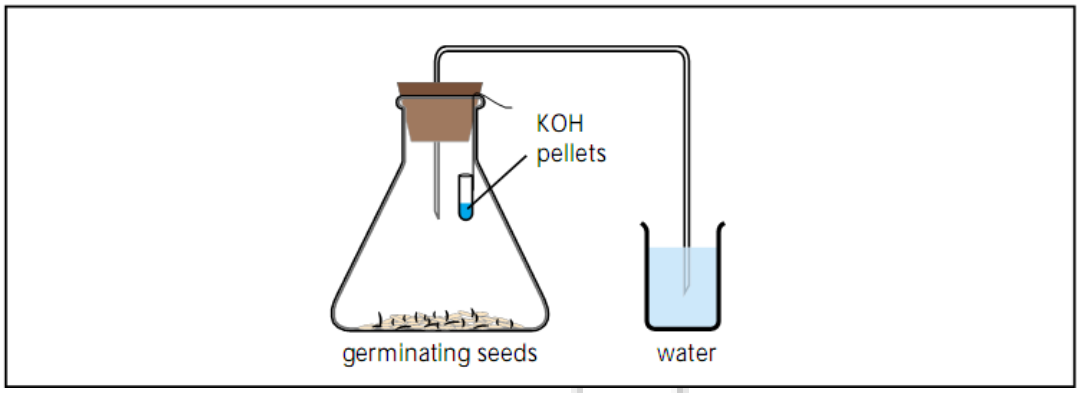
2. In the experiment shown in the figure, water is found to rise in the bent tube.



The reason is that
(a) Seeds use up oxygen in the flask.
(b) Carbon dioxide is given out by the germinating seeds.
(c) Germinating seeds attract water from the beaker.
(d) Seeds use oxygen and release carbon dioxide which is absorbed by potassium

hydroxide.

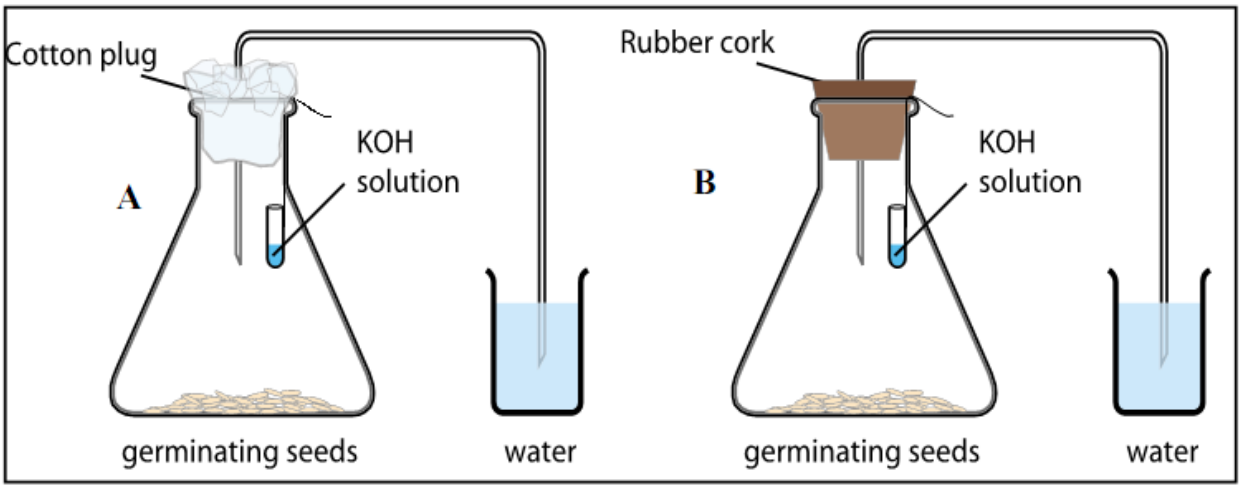
3. The following experiment is set up to show that a gas is released during respiration.



In this set up, the small test tube containing pellets of KOH is kept in the conical flask to absorb

(a) air in the flask.
(b) moisture in the flask in the air in the flask.
(c) O2
(d) CO2 released by the germinating seeds.

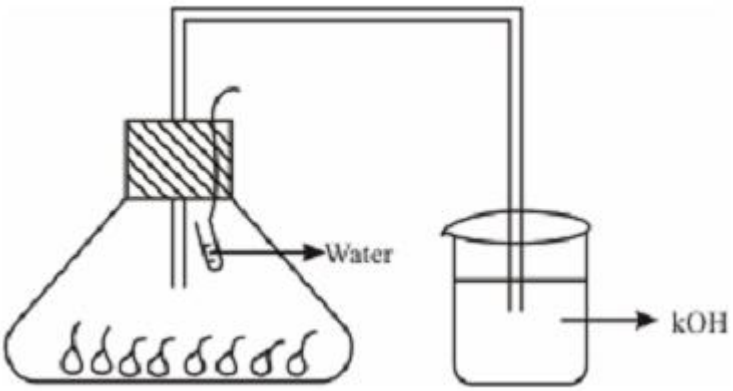
4. Using the same number of given germinating gram seeds, two students A and B set up the experiment separately. Student A used a cotton plug to hold the bent tube in the mouth of the flask. Student B used a rubber cork.



After 4 hours they noticed that

(a) water level increased in the bent tube only of A.
(b) water level increased in the bent tube only of B.
(c) the cotton plug was wet.
(d) the water in the beaker of B turned milky.

5. A student while setting up the experiment to show that CO2 is evolved during respiration committed some errors shown in the figure



What changes should be made in the set up to get the desired results?

a. KOH solution should be taken in the small test tube inside the flask and germinating seeds in the beaker.

b. Water should be taken in the beaker and KOH solution in the flask.

c. KOH solution should be taken in the small test tube inside the flask and water should be taken in the beaker

d. Water should be taken in the flask and KOH solution in the small test tube.

6. The seeds used in the experiment to show that CO2 is given out during respiration are

a. dry seeds

b. boiled seeds

c. crushed seeds

d. germinating seeds.

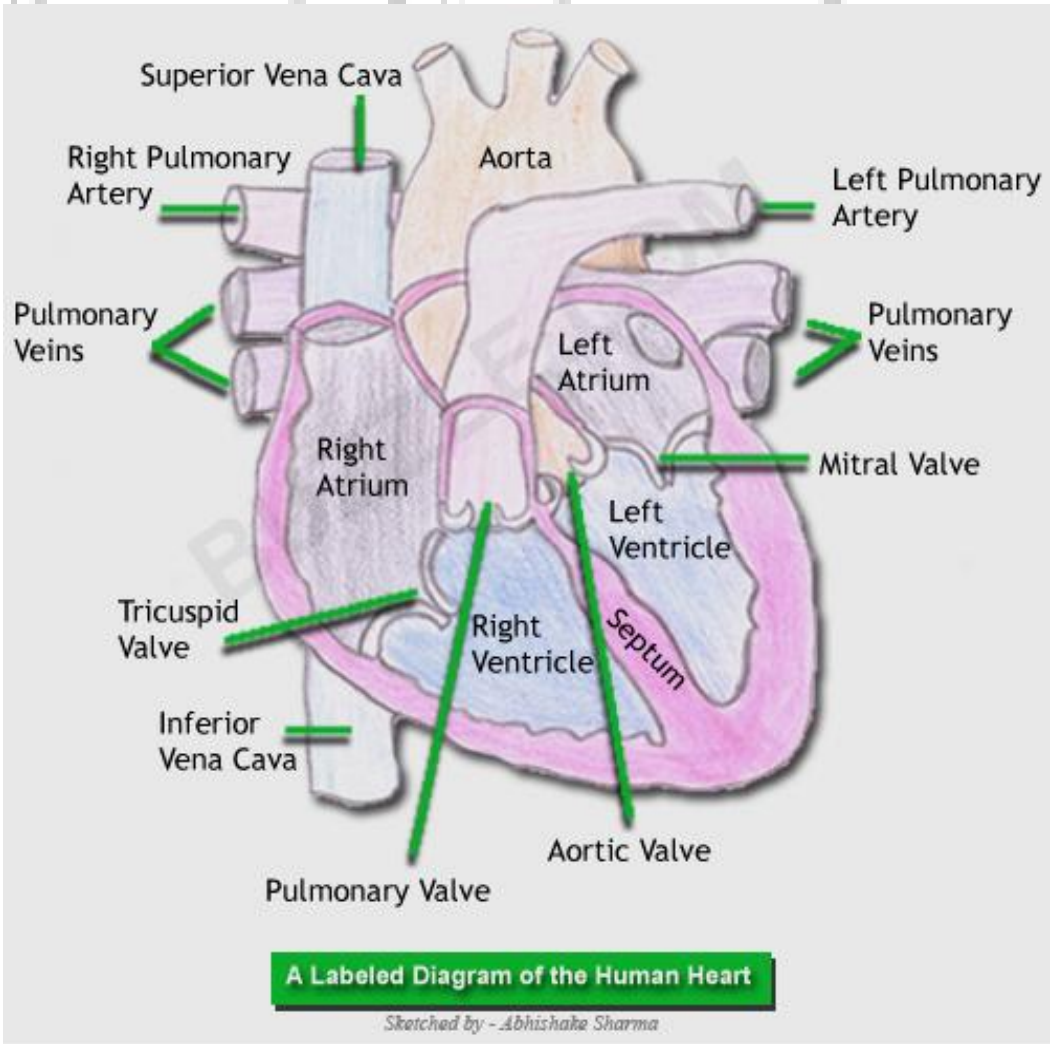
Chapter 11

LIFE PROCESSES

Transportation

1. Blood is a liquid connective tissue. Identify the components of blood that perform the following functions:
   a) Clotting of blood_____
   b) Carrier of Oxygen _____
   c) Carrier of essential components and waste _____

2.



3. The internal structure of the vertebral heart explains why mammals and bird are warm-blooded animals while reptiles; amphibians and fish are cold-blooded animals. Justify.

4. Give reasons for the following:

   a) Walls of the ventricles are thicker than that of atria.

   b) Lymph is called extra cellular fluid

   c) Valves are present only in veins and not arteries.

   d) All arteries do not carry oxygenated blood.

   e) Exchange of materials between blood and surroundings takes place in the capillaries rather than arteries & veins.

5. Fill the following table:

S no	Points of difference	Xylem	Phloem
1	Functional cells		

2	Dead / alive		
3	Function		
4	Direction of movement		

6. Movement of substances in Xylem is unidirectional while it is multidirectional. Explain.

7. Give the role of water column and transpiration in the water movement from roots to above ground parts.

8. What would be the consequences of deficiency of hemoglobin in the human body?

9. State the functions of Lymph.

10. What is the advantage of separate channels in mammals and birds for oxygenated and deoxygenated blood?

11. How are water and mineral transported in plants?

12. Differentiate between transpiration and translocation.

MCQs : Transportation

1. Valves are present in
   a) Arteries
   b) Veins
   c) Capillaries
   d) All the above

2. Deoxygenated blood is received by the _____.
   a) left auricle
   b) right auricle
   c) left ventricle
   d) right ventricle

3. The liquid portion of the blood is called _____.
   a) water
   b) plasma
   c) serum
   d) sap

4. Much of the transpiration takes place through _____.
   a) stomata
   b) lenticels
   c) cuticle
   d) epidermis

Chapter 11

LIFE PROCESSES

Excretion

1. Define the following
   Excretion :

   _____

   _____

   _____

   _____

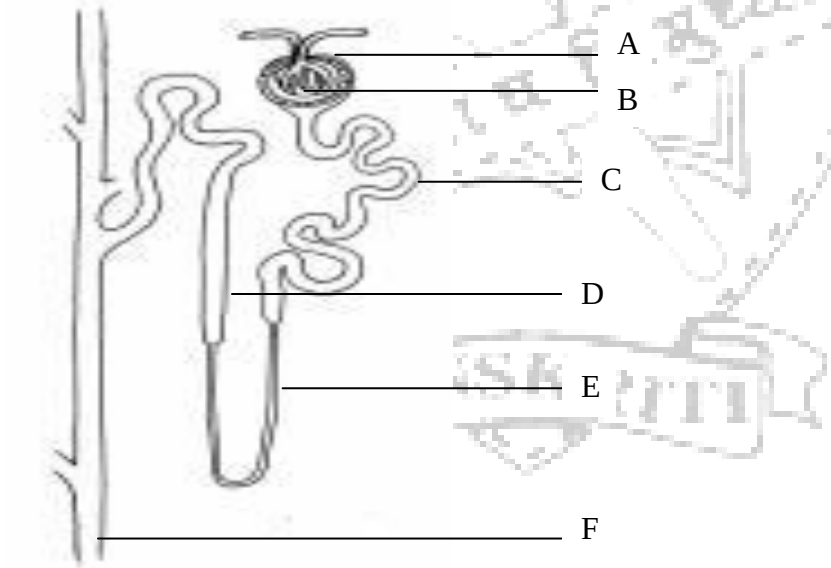
   Osmoregulation :

   _____

   _____

   _____

   _____

2. 

   Name the structure depicted above. Where are they found?

   Label the following parts and give their function

   a) Glomerulus_____

   b) Bowman's capsule_____

3. c) Collecting duct_____

Give reasons for the following---

a) Re absorption is an important step in urine formation

b) The amount of water in the urine is variable

4. Give an account of excretion in plants.

5. Name two excretory products other than oxygen and carbon dioxide in plants.

6. What happens to the glucose that enters the nephron along with the filterate?

7 How is urine eliminated in human excretory system?

8 The kidneys perform the essential function of removing waste from the blood and regulate the water fluid levels. Explain.

MCQs : Excretion

1. Urea is transported by

   a) plasma

   b) blood

   c) RBC

   d) WBC

2. The kidneys resemble the contractile vacuoles of *Amoeba* in

   a) expelling out excess of water

   b) expelling out glucose

   c) expelling out waste material along with water

   d) expelling out salts

3. The function of the mammalian kidney is to excrete

   a) extra salts, urea and excess water

   b) extra urea, excess water and excess amino acids

   c) extra urea, extra carbohydrates and extra water

   d) extra urea, extra salts and extra sugar

Chapter 12

CONTROL AND COORDINATION

13. Define a receptor. Give the functions of gustatory and olfactory receptors.

14. a) Draw & label a neuron & with the help of an arrow mark the direction of the impulse.

b) Give 2 differences between synapse and a neuromuscular junction.

15. Define reflex action and reflex arc. What is the importance of reflexes?

16. How are brain and spinal cord protected?

17. What are the components of the Peripheral Nervous System (PNS) and its function?

18. Why are reflex arcs evolved in animals?

19. How does the nervous tissue cause action? Explain

20. Our heart beats without our thinking about it. How?

21. Name the plant hormones along with their role in plant control and coordination.

.

22. Describe any 4 plant movements.

.

23. Give the function of the following hormones along with diseases/abnormalities caused
. due to their under secretion and Over secretion respectively of each----

a) Thyroxin

b) Insulin

c) Growth hormone

24. Name three main parts of human brain along with their functions.

.

25. Give an example of feedback mechanism in human beings.

26. Why people suffering from diabetes are advised to have less sugar?

MCQs : Control and Coordination

1. The cells in our body that can be over a foot long are _____.

   a) muscle cells

   b) nerve cells

   c) bone cells

   d) blood cells

2. The substance that accelerates the growth in the stem is ____.

   a) auxin

   b) cytokinin

   c) enzyme

   d) vitamin

3. Learning is related to _____.

   a) hypothalamus

   b) thalamus

   c) cerebrum

   d) Cerebellum

4. Male hormone is _____.

   a) oestrogen

   b) progesterone

   c) adrenaline

   d) testosterone

5. Endocrine glands are those which pour their secretions into _____.

a) Blood

b) Ducts

c) Sinuses

d) any of the above

6. In reflex action, the reflex arc is formed by _____.

a) muscles - receptor - brain

b) muscles - effector - brain

c) receptor - spinal cord - muscles

d) spinal cord - receptor - muscles

7. Auxins are _____.

a) Vitamins

b) Enzymes

c) Proteins

d) Phyto hormones

8. The cerebellum is concerned with _____.

a) Conditioning

b) Memory

c) coordination and precision

d) Intelligence

9. The endocrine gland also known as 'master gland' is _____.

a) Hypothalamus

b) Pituitary

c) Pancreas

d) Adrenal

10. Which of the following acts as both endocrine and exocrine glands?

a) pituitary

b) Adrenal

c) Pancreas

d) Thyroid

11. Cerebral hemispheres are centres of _____.

a) Balance

b) Smell

c) Taste

d) Thinking

12. Adrenaline increases _____.

a) heart rate

b) blood pressure

c) amount of glucose in blood

d) all the above

13 Junction of two neurons is called _____.

a) Synapse

b) end plate

c) Axon

d) Dendrite

14. Growth hormone is produced in _____.

a) hypothalamus

b) Pituitary

c) Pancreas

d) Thyroid

15. An involuntary response to a stimulus is known as _____.

a) Jerking

b) Reflex

c) conditioning

d) Answer

16. The CNS consists of _____.

a) Brain

b) spinal cord

c) brain and spinal cord

d) brain, spinal cord and all the nerves

17. Cerebrum is present in the _____.

a) fore brain

b) mid brain

c) hind brain

d) partly in a and b each

18. Cerebellum is situated in _____.

a) fore brain

b) mid brain

c) hind brain

d) partly in a and b each

19. Medulla oblongata is situated in _____.

a) fore brain

b) mid brain

c) hind brain

d) partly in b and c each

20. The hormone that speeds up the ripening process is _____.

a) Auxin

b) gibberelin

c) cytokinin

d) Ethylene

Chapter 13

HOW DO ORGANISMS REPRODUCE?

1 What is the significance of reproduction?

_____

_____

2 Why DNA copying in reproduction is accompanied with the formation of additional cellular apparatus?

_____

_____

3. Compare asexual & sexual reproduction.

ASEXUAL	SEXUAL

4. What is the cause of variation? Write its significance.

_____

_____

_____

_____

_____

5. Why is process of regeneration not same as reproduction?

_____

_____

6. Differentiate between binary fission & multiple fission as seen in *Amoeba* and *Plasmodium*.

BINARY FISSION	MULTIPLE FISSION

7. What are the advantages & the disadvantages of vegetative reproduction?

_____

_____

_____

_____

_____

8. Identify the type of asexual reproduction/s seen in the given organisms.

Spirogyra -

_____

_____

Yeast

_____

_____

Penicillin-

_____

_____

Planaria-

_____

_____

Bryophyllum leaf

_____

_____

Rhizopus-

_____

_____

Hydra-

_____

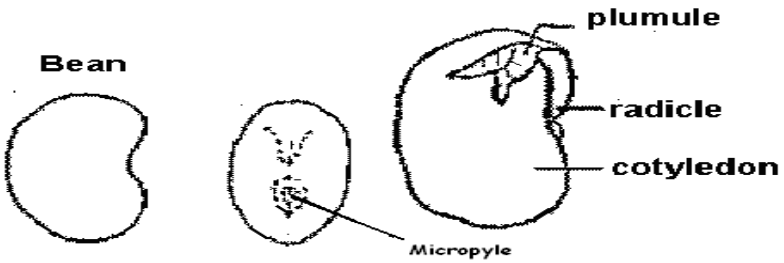
_____

9. Draw & label the Longitudinal section of a typical bisexual flower.

10. What will be the number of chromosomes in the following cells of human body
    i) Muscle cell
    ii) Sperm
    iii) Liver cell
    iv) Egg/ovum

11. Why are testes located outside the abdominal cavity in human males?

12. What are the advantages of internal fertilization in animals?



13. What is depicted in the above diagram? Give the function of the labeled parts. Is bean a monocot or a dicot? Why?

14. List the changes that take place in a flower after fertilization.

15. Name two unisexual and two bisexual flowers.

16. Write the full form of STD .Give 2 examples.

17. How do oral pills help in contraception?

18 Draw a neat and well labeled diagram showing pollen germination on stigma. What happens to the ovules and ovary after fertilization?

19 There is an alarming decline in the sex ratio in our society. Comment.

20 The size of the human population is a cause for concern. Comment.

21 Name the sexually transmitted diseases caused by bacteria and viruses.

22 Name the glands / organs that perform dual functions. Indicate their dual functions.

S no	**Organ**	**Function 1**	**Function 2**
1	Pancreas	As Exocrine gland:	As Endocrine gland:
2		Produces gamete - ova	Endocrine Function:
3			**Endocrine Function: Regulates male accessory organs & Secondary sexual characters through production of male sex hormone.**

23 Briefly discuss any 3 contraceptive devices.

_____

_____

_____

_____

_____

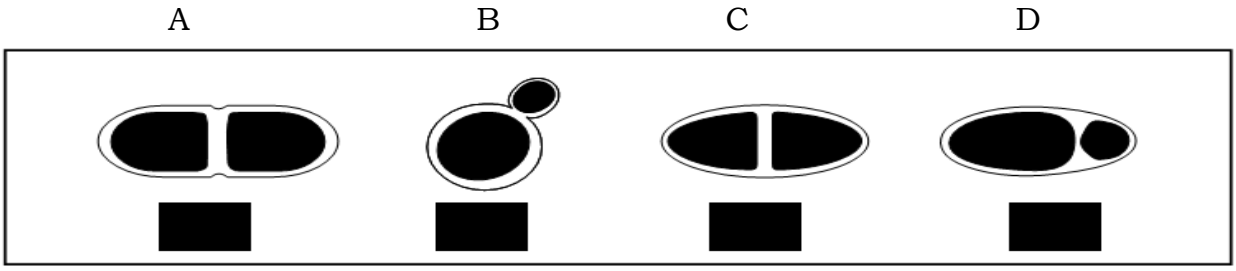
_____

_____

_____

MCQs: How do organisms reproduce?

1. The budding in yeast is illustrated by the diagram ABCD



(a) A. (b) B. (c) C. (d) D.

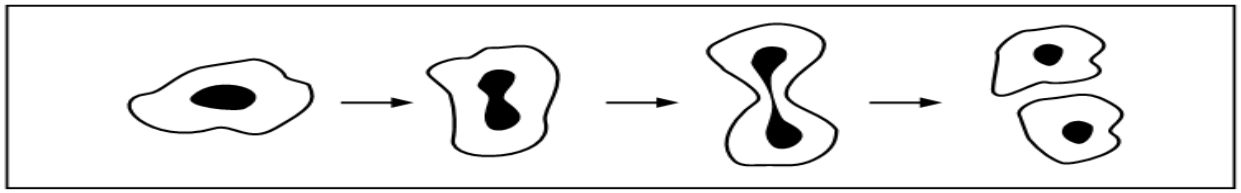
2. A student is given a permanent slide showing binary fission in *Amoeba*. The following are the steps in focusing the object under the microscope.

a) Place the slide on the stage; look through the eye piece and adjust the mirror and diaphragm to get even illumination.
b) Look through the eye piece and raise the objective using coarse adjustment until the object is focused.
c) Make the focus sharp with the help of fine adjustment.
d) Look through the eye piece and move the slide until the object is visible.

The proper sequence of steps is

(a) (i), (iii), (iv), (ii).
(b) (ii), (iii), (iv), (i).
(c) (iv), (iii), (ii), (i).
(d) (i), (iv), (ii), (iii).

3.The process represented in the diagram below is the



(a) formation of spores in *Amoeba*.
(b) formation of bud taking place in *Amoeba*.
(c) identical gametes being formed in *Amoeba*.

(d) formation of daughter cells in *Amoeba*.

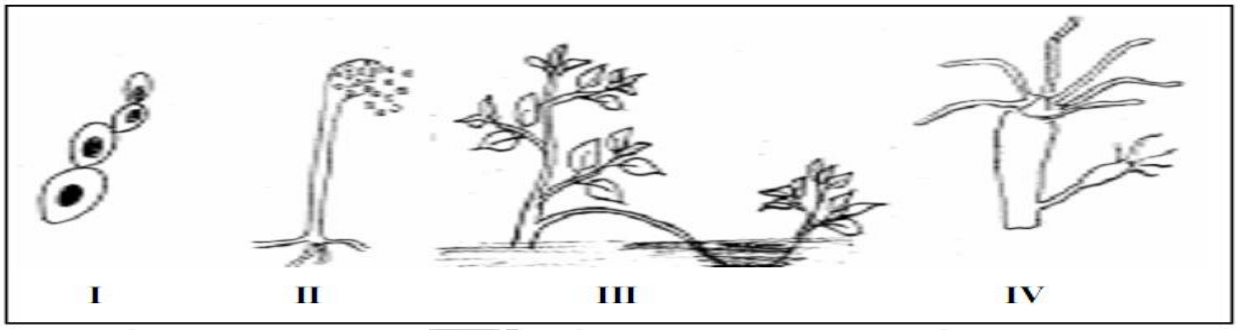
4. Two of the following four figures that illustrate budding are

(a) 1 and 2.

(b) 1 and 3.

(c) 1 and 4.

(d) 2 and 4.



5. Which one of the following is depicted in the sketch of a slide shown below :

a. Binary fission in yeast
b. Budding in yeast
c. Binary fission in *Amoeba*
d. Budding in *Amoeba*

6. Identify the mistake in the following sketch of budding in yeast.

a. Bud is shown to be smaller than parent cell.
b. Nuclei are present in both bud and parental cell.
c. Both parent and bud are shown as single cells.
d. Bud is wrongly labeled.

7. Following diagrams were drawn by four different students on having seen a prepared slide of budding in yeast

(I) (II) (III) (IV)

The correct diagram is

a. I
b. II
c. III
d. II and IV

8. A slide showing several *Amoeba*e was given to a student and was asked to focus the *Amoeba* undergoing binary fission. What will the student look for to correctly focus on a dividing *Amoeba*?

a) An *Amoeba* with many pseudopodia and a small nucleus.
b) A rounded *Amoeba* with rounded nucleus.
c) An *Amoeba* covered by a cyst and many nuclei
d) An *Amoeba* with elongated nucleus and a constriction in the middle.

CELL DIVISION :THE FUNDAMENTAL PROCESS IN ALL LIFE FORMS

- Cell is the fundamental unit of all life forms.
- An organism is called unicellular if it is made of one cell and multicellular if it is made up of many cells.
- All cells arise from pre-existing cells through a process called cell division.
- Cell division is of two types MITOSIS and MEIOSIS
- MITOSIS is a type of cell division during which one cell divides to give rise to two cells with the same number of chromosomes. It is also called Equational division. In all living organism it occurs during growth, repair and regeneration. In unicellular organisms this type of division is the same as reproduction.
- MEIOSIS is also called reduction division. This type of cell division plays an important role in keeping the chromosome number constant generation after generation. The cell division results in formation of four cells with half the number of chromosomes as the mother cell. For example if mother cell has 4 chromosomes after meiosis it will form four cells with two chromosomes each.
- Each species has a constant number of chromosomes. The organism can contain paired condition of chromosomes. Such organisms are called Diploid and are represented as 2n/2x. Organisms that contain single status of chromosomes are called Haploid n/x.
- In diploid organisms Meiosis occurs at the time of gamete formation so that the male and female gametes contain the haploid number half the chromosome number of chromosomes. During fertilization when these gametes fuse the diploid number of the species is restored.

- The chromosome number for human beings is 46 or 23 pairs. Females contain 22 pairs and 1 pair of XX chromosomes and males contain 22 pairs and XY chromosomes.
- During male and female gamete formation Meiosis occurs in the testis and ovary to form sperms and Ova respectively. All ova contain 22 chromosomes and X chromosome. However 50% sperms contain 22 chromosomes and X chromosome and the other 50% contain 22 chromosomes and Y chromosome.
- A child inherits 23 chromosomes from the mother and 23 chromosomes from the father thus restoring the human diploid chromosome number of 46 (23 pairs).
- The child will always inherit X chromosome from the mother. If It gets Y chromosome from the sperm the sex of the child will be male. On the other hand if it receives another X chromosome from the sperm the child will be a female. It is clear that in human beings the sex of the child is determined by the father. The mother does not pay any role in determining the set of the child.

Chapter 14

HEREDITY AND EVOLUTION

1. Name the molecule that carries the genetic information. What type of changes in the genetic material cause variations?

2. What are the causes of variations in a species that reproduces asexually?

3. Why does sexual reproduction produce more variations?

4. Why is it necessary to have half the number of chromosomes in gametes?

5. Define the following terms:

   a) Genes:_____

   b) Dominant trait:_____

c) Recessive trait:_____

_____

d) Independent inheritance:_____

_____

e) Acquired traits:_____

_____

f) Genetic drift:_____

_____

g) Natural selection:_____

_____

h) Speciation:_____

_____

i) Artificial selection:_____

_____

6. Mendel did not get any plants of medium height when he crossed pure tall plants with pure dwarf plants. What inference can you draw from this observation?

_____

_____

_____

_____

7. Explain the mechanism of sex determination in human beings.

_____

_____

_____

_____

8. Which contrasting characters of the pea plant did Mendel choose for his experiment

_____

_____

_____

_____

9. Two organisms can have the same phenotype but may or may not have the same genotype. Explain taking an example.

_____

_____

_____

_____

10. What is the basis of the evolutionary process?

11. How do fossils serve as an evidence for evolution?

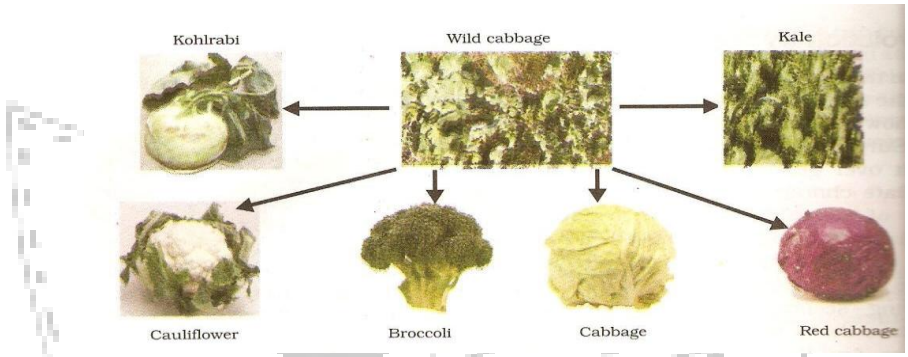
12. How is the age of fossil determined?

13. How do homologous and analogous organs point towards evolution?

14. Every living organism is an evolutionary success story. Explain.

15. Write a short on human evolution.

16. The picture below shows evolution of the wild cabbage. Explain this from the perspective of natural selection.



17. Black coat colour is dominant over white coat colour in guinea pigs. What kind of offspring would you expect in the F1 generation when a pure black animal is crossed with a pure white animal? If the siblings were crossed, what would the F2 generation be like?

18. Write down the ratio of progeny obtained from the following cross:
    a) RrYy x rryy

b) RRYY x rryy

19. Name any 3 organs of other animals that are homologous to the human hand.

20. When does the process of gene flow take place?

21. Bacteria have simple body plan as compared to human beings. Does it mean that human beings are far more evolved than bacteria? Justify.

MCQs : Heredity and Evolution

1. Alternative forms of a gene are called _____.

a. loci
b. multiples
c. chromosomes
d. alleles

2. Heredity or inheritance of specific traits became clearer due to

a. Lamarck's theory
b. Mendel's work on garden peas
c. Darwinism
d. Neo-Darwinism

3. Which of these is homozygous recessive?

a. Ss
b. ss
c. SS
d. s

4. What will be the genotypic ratio of the cross between Rr and rr?

a. 1:2:1
b. 3:1
c. 1:1
d. 1:1:1

5. What will be the genotypic ratio of the cross between Rr and Rr?

a. 1:1
b. 3:1
c. 1:2:1
d. 1:1:1

6. The offspring resulting from a cross between two pure homozygous recessives would be _____.

a. 50% homozygous recessive and 50% homozygous dominant
b. 75% homozygous recessive and 25% heterozygous dominant
c. 75% homozygous recessive and 25% homozygous dominant
d. 100% homozygous recessive

7. On what cellular structures are genes in eukaryotes carried?

a. Endoplasmic reticulum
b. Nuclear membrane
c. Chromosomes
d. Mitochondria

8. Which of the following sentences is true about the evolutionary process?

a. There is no real 'progress' in the idea of evolution.
b. humans are unique, a totally new type of organism.
c. progress is nature's religion.
d. Evolution of life forms was rapid in the beginning ages.

9. In man the chromosome number is 46. How many chromosomes are present in man's muscle cells?

a. 23
b. 46
c. 69
d. variable

10. The component of a chromosome that controls heredity is ____.

a. proteins
b. histones
c. DNA
d. RNA

11. Speciation takes place when variation occurs with

a. mood changes

b. death of an organism
c. changes due to accidents
d. geographical isolation

12. Number of chromosomes in a human male is _____.
a. 23
b. 23 pairs
c. 22 pairs +XY
d. 22 pairs

13. By studying analogous structures we look for _____.
a. similarities in appearance and function but different in structure
b. similarities in appearance bur differences if functions
c. Similarities in organ structure
d. Similarities in cell make up

14. Which of the following are not examples of analogous structures?
a. Wings of bat and butterfly
b. Wings of bat and forelimb of cattle
c. Thorn and spine
d. Tendril of *Lathyrus* and tendril of *Gloriosa*

15. Speciation is the evolutionary process by which _____.
a. a new gene pool is formed
b. evolutionary paths of species converge
c. New species are formed
d. Shows up differences in physical traits

16. Evidences of evolutionary relationships are found in _____.
a. atmosphere
b. fossils
c. ocean beds
d. rocks

Chapter 15

OUR ENVIRONMENT

1) Give some examples of biodegradable substances. Why are they called so? How does degradation occur in nature?

2) Define ecosystem.

3) What are the components of the ecosystem?

4) Which among the following are the abiotic components of an ecosystem?
Herbs, sunlight, bacteria, soil, wind, water.

5) Name a man-made ecosystem.

6) What is the role of the producers and decomposers in an ecosystem?

7) Explain the 10% Law with respect to movement of energy in the ecosystem.

8) Why is a food chain never more than 4 levels?

9) Consider the following food chains:

   a) Plants → Mice → Snakes → Hawks

   b) Plants → Mice → Hawks

   If energy available at the producer level in both the food chains is 100J, in which case will hawks get more energy? Justify your answer.

10) Draw a food web of a terrestrial habitat.

11) Why does biological magnification happen?

12) State the causes and effects of ozone depletion.

13) What will be the effect of the extinction of carnivores in a forest ecosystem?

14) How can you help to reduce the problem of waste disposal? Give any two methods.

MCQs : Our Environment

1. A natural phenomenon that becomes harmful due to pollution is _____.
a. global warming
b. ecological balance
c. deforestation
d. desertification

2. The chemical responsible for ozone holes is _____.
a. CO_2
b. SO_2
c. CO
d. CFC

4. Animal dung is _____ waste.
a. biodegradable
b. non-biodegradable
c. hazardous
d. toxic

5. Which of the following is biodegradable?
a. iron nails
b. plastic mugs
c. Paper plates
d. Donas made of plant leaves

6. Which of the following is non-biodegradable?
a. animal bones
b. nylon
c. tea leaves
d. Kitchen waste

7. In a lake polluted with pesticides, which one of the following will contain the maximum amount of pesticides?

a. small fish
b. microscopic animals
c. big fish
d. water birds

8. Name the process in which a harmful chemical enters the food chain and gets concentrated at each level in the food chain.

a. concentration
b. biomagnification
c. expansion
d. Pollution

Chapter 16

MANAGEMENT OF NATURAL RESOURCES

1) Why was the Ganga Action Plan started?

_____

_____

_____

_____

_____

2) The presence of coliform bacteria in water is a pointer towards its polluted state. Justify.

_____

_____

_____

_____

_____

3) Why has it become imperative to manage our resources well?

_____

_____

_____

_____

_____

4) What do you mean by sustainable management of resources? Explain two ways by which we can manage our fossil fuels and water.

_____

_____

_____

_____

_____

5) Explain the term 'Biodiversity hotspots'. Name some of these hotspots of our country.

6) Recycling of articles results in wastage of energy and money, therefore, one should practice reuse. Justify.

7) Name any two industries that are dependent on forests?

8) Why is it beneficial to involve local people to take care of the forest resources? Explain with the help of an example.

9) Why do environmentalists not favor the construction of large dams?

10) Name a few traditional methods of water harvesting practiced in various parts of the country.

11) Enlist at least 5 ways by which energy consumption can be reduced.

MCQs : Management of Natural Resource

1. Which one of the following is an example of biotic component of environment?

a. Wind
b. Water
c. vegetation
d. temperature

2. Which of the following is a non renewable resource?

a. solar Energy
b. hydrocarbon fuel
c. flora and fauna
d. nuclear power

3. Sanctuaries are established to_____.

a. develop commercial tree plantation
b. conduct ecotourism on wildlife
c. protect animals
d. conduct research on Biodiversity

4. Global warming has resulted due to

a. increased emissions of fine particulates from automobiles
b. increased emissions of CO_2 from automobiles
c. Oxides of sulphur and nitrogen
d. lack of rainfall worldwide

5. The main cause of mismanagement of natural resources is because of _____.

a. Increase in population
b. The conversion of land for food crops
c. Demand for petroleum
d. Individuals not using the three R's

PRACTICE PAPER 1

Time: 3 hrs 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 three questions of the five marks category. Only one option in such questions is to be attempted.
4. All questions in Section A and Section B are to be attempted separately.
5. Q1 to 3 are one mark questions to be answered in one word or one sentence.
6. Q 4-7are two mark questions to be answered in about 30 words.
7. Q 8- 19are three mark questions to be answered in about 50 words.
8. Q 20-24 is five mark questions to be answered in about 70 words.
9. Q 25-42 in Section B is multiple Choice questions based on Practical skills. Each question is a one mark question. You are to choose one most appropriate response out of the four provided to you, number the question correctly and write down only the correct option in your answer **sheet.**

Q1	Define peristalsis.	1
Q2	Which pancreatic enzyme is effective in digesting fats?	1
Q3	Name the element- 1. A dull metal 2. Hardest natural element 3. A metal which is a poor conductor of electricity. 4. A liquid non metal	1
Q4	1. What is the difference between roasting and calcination? 2. Explain the formation of sodium metal from molten sodium chloride with an equation.	2
Q5	Mrs. Mehra visited her friend's newly constructed home and observed a huge solar geyser installed on the roof. She was unable to understand, why her friend did not spend money to install a geyser in each bath room. Her friend however, convinced Mrs Mehra to install the same on her roof top too a. Mention two values exhibited by Mrs. Mehra's friend? b. List two important advantages of solar powered devices?	2

Q6 If 25 electrons each carrying a charge of 1.6X 10^{-19} C are flowing across a metallic wire in 6 s from north to south. Calculate the electric current and give the direction of the flow of current? 2

Q8 Two electric lamps of ratings 60W,220V and 40W,220V are connected in series to an electric supply . 3

a. Draw a closed electric circuit to show the above connection?

b. Calculate the total current drawn from the electric supply?

c. Total energy consumed by the two lamps if operated for 2 hours?

Q9 Draw a neat labelled figure to show a cylindrical coil made up of many turns of insulated copper wire connected to a galvanometer. 3

State your observations when-

a. A bar magnet is pushed into or pulled out of the coil?

b .Name the phenomenon involved and define the same?

Q10 A metallic rod is suspended perpendicular to the magnetic field of a horse shoe magnet. The rod gets displaced towards the left when a current is passed through it. What will happen if- 3

a. The horse shoe magnet is replaced by a weaker magnet, maintaining the same polarity?
b. The strength of the current is increased?
c. State the rule to determine the direction of the force experienced by the live conductor in a magnetic field?

Q11 Write an activity to show that metals conduct electricity. 3

Q12 1. Show the bond formation in MgO. 3

2. Why does this compound have a high melting point?

Q13 1. Write the chemical name and chemical formula of bleaching powder. 3

2. What happens when bleaching powder is left exposed to air?

Why is bleaching powder used in water treatment plants

Q14 Mohit is very fond of soft drinks and even though his mother stops him from doing so every day, he needs at least a glass of soft drink each day. 3

1. List two diseases Mohit might suffer from.
2. How can he treat his problems?

What values must Mohit cultivate in order to overcome his problems?

Q15 Give three methods used by plants to get rid of their waste products. 3

Q16 Draw a diagram to explain nutrition in *Amoeba*. 3

Q17 Define hormones. Name the hormone secreted by pituitary. Give one function of the hormone. 3

Q18 **a.** Explain giving relevant scientific reasons, why a parallel arrangement is desirable for domestic appliances. 3

b. Mention an important difference between alternating current and direct current? Show the graphical representation showing the variation of alternating current with time?

Q20 Balance the following chemical equations and classify them as types of reaction- 5

1. $NaOH + HCl \rightarrow NaCl + H_2O$
2. $Al + HCl \rightarrow AlCl_3 + H_2$
3. $Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$
4. $Na + O_2 \rightarrow Na_2O$
5. $CaCl_{2(aq)} + K_3PO_{4(aq)} \rightarrow Ca_3(PO_4)_{2(s)} + KCl_{(aq)}$

OR

1. Explain electrolytic refining of copper with a diagram. Give the reactions involved too.
2. Blue colour of copper sulphate fades away on heating and is regained after sometime when it is allowed to cool. Explain why with a balanced chemical equation.

Q21 Give reasons for the following- 5

1. Sodium metal is stored under kerosene.
2. Magnesium can displace zinc from zinc sulphate solution but zinc cannot displace magnesium from magnesium sulphate solution.
3. HCl does not show acidic behavior when dissolved in benzene.
4. A milkman adds a little baking soda to milk.
5. Lemon juice or vinegar can be used to clean kitchen utensils.

OR

1. You have five solutions A, B, C , Dand E. The pH of A is 12, B is 6, C is 1, D is 7and E is 9.
   a. Identify the most acidic and most basic solutions.
   b. Arrange the solutions in decreasing order of their hydrogen ion concentration.
   c. Which of them is most likely to be a mineral acid?
   d. What precautions must you take while diluting a mineral acid?

Which of these would not show any indicator test and why?

Q22 a. Draw the magnetic field lines within and outside a current carrying circular loop of wire? 5

b. Why don't two magnetic field lines intersect each other?

c. List two important properties of the magnetic lines of force?

d. Define magnetic field of a magnet? Represent a uniform magnetic field with a neat figure?

Q23 a. Show the symbols for a – variable resistor, wire joint ? 5

b .Draw a circuit diagram consisting of a nichrome wire XY, an ammeter, 4 cells of 1.5V each, a closed tap key, a voltmeter and a rheostat to study the relationship between current and potential difference?

c. Show the nature of the V-I graph obtained if the values are plotted?

d. Give the statement of the law that gives the relationship between potential difference and current?

e. How will the resistance and resistivity be affected ,if the length of the resistance wire used in the above circuit is halved?

Q24 a) State the functions of the following components of the human transport system. 5

i. Blood.

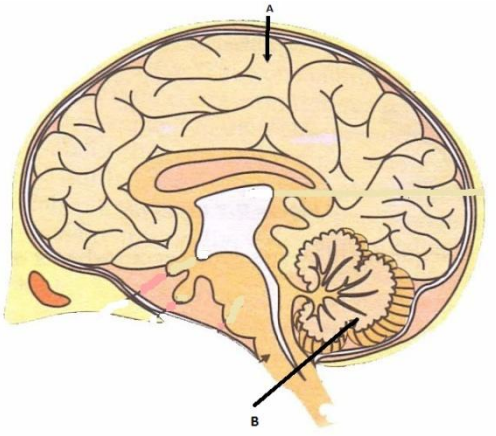
ii. Lymph.

b) Why is double circulation of blood necessary in human beings?

c) Give any two differences between arteries and veins.

OR

a) Label the parts marked in the given diagram. 5



b) Give one function of the parts labeled A and B.

c) Give one function of each of the following plant hormones:

i. Auxin

ii. Abscisic acid.

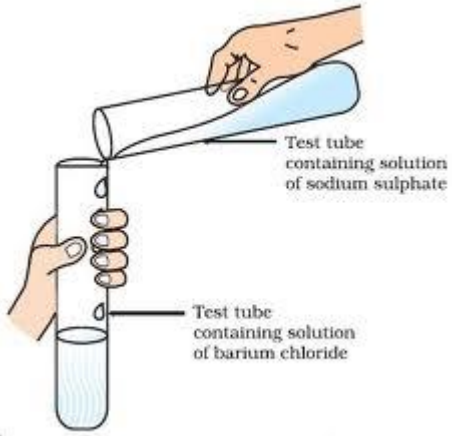
SECTION B

Q25 Two beakers A and B contain ferrous sulphate solution. In the beaker A is placed a small piece of copper and in beaker B is placed a small piece of zinc. From these observations, it can be concluded that- 1

a. Zinc is most reactive metal followed by iron and copper.
b. Zinc is most active metal followed by copper and then iron
c. Iron if most active metal followed by zinc and then copper

Iron is the most active metal followed by copper and then zinc

Q26 1



The above picture shows-

1. Displacement reaction
2. Precipitation reaction
3. Combination reaction
4. Neutralization reaction

Q27 CWhen carbon dioxide is passed through lime water, the milkiness formed is due to- 1

a. Calcium carbonate
b. Calcium hydroxide
c. Calcium bicarbonate
d. Calcium oxide

Q28 A few drops of liquid X were added to distilled water. The pH decreased. The solution X is most likely to be- 1

a. Sodium bicarbonate
b. Sodium carbonate
c. Lime water

Hydrochloric acid

Q29 Which one of the following substances would you need to identify the gas evolved when dil. HCl reacts with sodium carbonate- 1

a. Lime water
b. Carbon disulphide
c. Burning splinter

Litmus paper

Q30 Which of the following chemical properties are shown by dilute sulphuric acid? 2

a. It turns blue litmus red
b. It turns red litmus blue
c. It reacts with iron to form hydrogen gas
d. It reacts with solid sodium carbonate to give brisk effervescence.
   i. a and b
   ii. a and c
   iii. a, c and d

b, c and d

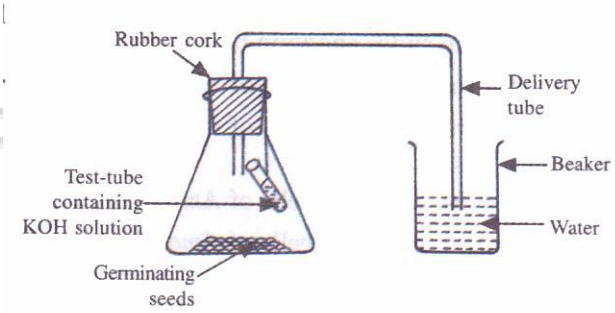
Q32 The most appropriate part of leaf epidermis in a dicot plant to observe stomata and guard cells would be: 1

a) Upper epidermis.
b) Lower epidermis on mid rib
c) Veins
d) Any part on the lower epidermis but not on midrib.

Q33 A leaf is boiled in alcohol before using iodine for starch test in order to: 1

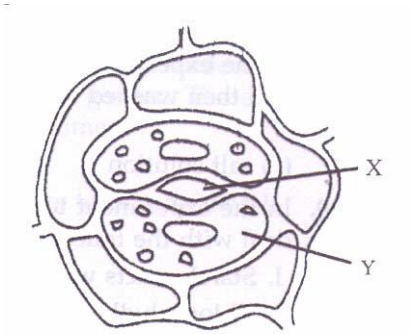
a) Dissolve starch
b) Dissolve chlorophyll.
c) Soften the leaf.
d) Make it react with iodine.

Q34 In which of the following set ups, water is likely to rise in the tube? 1



a) A
b) B
c) C
d) D

Q35 Four students A, B, C and D make the records given below, for the parts marked X and Y in this diagram. 2



STUDENT	X	Y
A	Stoma	Guard cell
B	Guard cell	Stoma
C	Epidermal cell	Stoma
D	Stoma	Epidermal cell

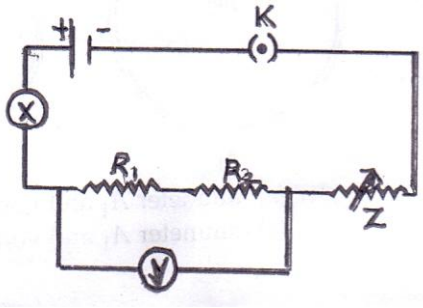
The correct record, out of these is that of student:

i. A
ii. B
iii. C
iv. D

Q38 A student was measuring the effective resistance of two equal resistances joined in parallel. His teacher joined two more resistors of the same value in the parallel combination. Now the net resistance will- 1

a. increase
b. decrease
c. remain the same
d. may increase or decrease.

Q39 The given circuit diagram shows the experimental arrangement of the different circuit components to determine the equivalent resistance of a series combination. The components X and Y in the circuit respectively will measure- 1



a) Resistance and current
b) Potential difference and Power
c) Current and Potential difference.

d) Potential difference and current.

Q40 An ammeter has 20 divisions between 20mA and the 30mA. The least count of the ammeter in mA is – 1

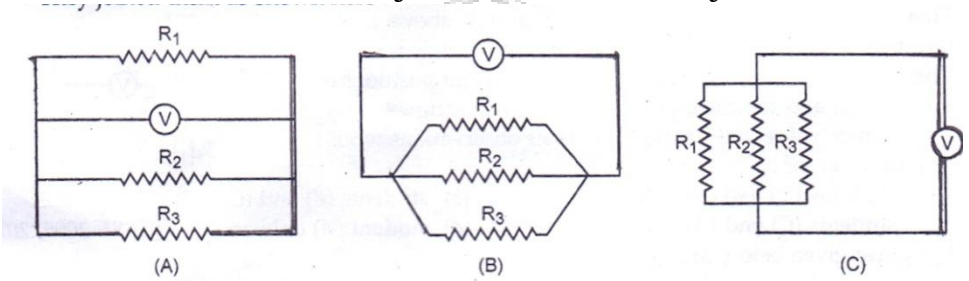
a. 0.5

b. 1

c. 0.25

d. 0.05

Q41 Three students A,B and C were asked to connect three resistors in parallel with a voltmeter and they made a circuit each, as shown below. The students who joined them correctly are- 1



a. A and B

b. B and C

c. A and C

d. A,B and C

Q42 If a student , while studying the dependence of current on the potential difference leaves the circuit closed for a long time to record the readings of the ammeter and voltmeter, then-

a) The ammeter's zero error will change.
b) The ammeter reading will be higher.
c) The resistor will get heated up, changing the value of the resistance.
d) All of the above.