FIRST TERMINAL PORTION

CLASS- 9 (BIOLOGY)

CHAPTER -2 (CELL :THE UNIT OF LIFE)

Q1. It is said that the protoplasm cannot be analysed chemically. Why?

Ans. The protoplasm cannot be analysed chemically because in order to do so ,it has to be removed from the cell and once it gets removed, it gets contaminated with impurities, loses its properties and dies.

Q2. What is the difference between an organ and organelle?

Ans. Organs are macroscopic and are present in the body of an organism where as organelles are microscopic and are present within a cell

Q3. Do you think the cells of an elephant would be larger than the cells of a rat? Explain briefly.

Ans. No, the cells of an elephant would not be larger than the cells of a rat. It would be more or less of the same size but the number of cells in an elephant would be much more as compared to a rat.

Q4. Differentiate between the following pairs of terms:

Ans. a) Protoplasm and Cytoplasm

Protoplasm- the entire living substance of a cell consisting of cytoplasm and nucleoplasm

Cytoplasm-the jelly-like substance which fills the entire cell excepting the nucleus

b) Nucleolus and Nucleus

Nucleolus -- darkly staining bodies found within a nucleus which participates in protein synthesis by forming and storing RNA

Nucleus- largest cell organelle located in a cell, which regulates cell functions,plays a role in cell division and heredity

c) Centrosome and Chromosome Centrosome-found only in an animal cell and initiates and regulates cell division. Chromosome-found in both animal cell and plant cell and transmits hereditary characteristics from parents to the offsprings

d) Cell wall and cell membrane .Cell wall — non living,made up of cellulose,freely permeable provides, rigidity and shape to plant cell Cell membrane-living,made up of lipo-proteins ,selectively permeable ,regulates entry and exit of substances into and out of both plant and animal cell.

Q5. Mention three features found only in plant cells and one found only in animal cells.

Ans. Plant cell —cell wall, vacuoles, plastids

Animal cell—centrosome

Q6. Why are the cells generally of a small size?

Ans. The cells are generally of a small size to ensure faster diffusion of nutrients,metabolic wastes and respiratory gases and also to ensure better communication between them

Q7. What is the cell theory? Who propounded it and when?

Ans. Postulates of cell theory:

a) The cell is the structural unit of life

b) The cell is the functional unit of life

c) All cells arise from pre-existing living cells.

It was propounded in the year 1839 by Schleiden and Schwann.

Q8. State the functions of the following:

a) Plasma membrane-It regulates the entry and exit of substances into and out of the cell

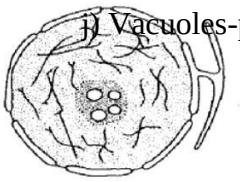
b) Ribosomes- Site of protein synthesis in a cell

c) Lysosome-Destroys its own cell when the cell is damaged,intracellular digestion during cell starvation

d) Mitochondria-Site of cellular respiration where energy is produced in the form of ATP
e) Golgi apparatus-Concerned with secretion of enzymes and hormones,forms acrosome in sperm
f) Cytoplasm-Site of chemical reactions with the help of enzymes
g) Asters of centrosome-Help in organization of spindle apparatus
h) Chromosomes-Transmission of hereditary characteristics from the parents to the offsprings
i) Glycogen granule-Stores glycogen as reserve food
j) Vacuoles-provide turgidity to plant cells

Diagram Based Questions

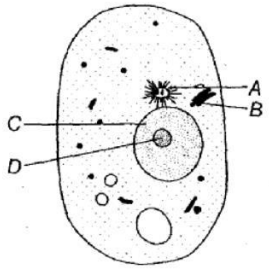
69. The figure shows a certain structure of a cell.



(i) Name the structure.
(ii) Why is it important to the cell?
(iii) Is this structure present in all the cells? If not, mention the cell.

Ans. (i) Nucleus
(ii) It controls all the activities of cell.
(iii) No, it is not present in all cells. Prokaryotic cells are devoid of nucleus.

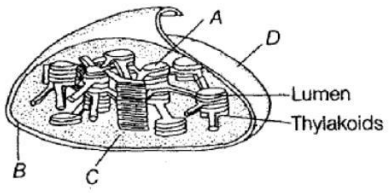
70. Given below is the diagram of a cell. Study the same and answer the questions that follows



(i) Name the parts *A, B, C* and *D* indicated by the guidelines.
(ii) State the functions of parts *B* and *C*.
(iii) State the function of *A*.

Ans. (i) *A*. Centriole *B*. Golgi body
C. Nucleus *D*. Nucleolus
(ii) *B*. Golgi body carries out excretion.
C. It is nucleus which controls cell activities.
(iii) *A*. It helps in cell divison.

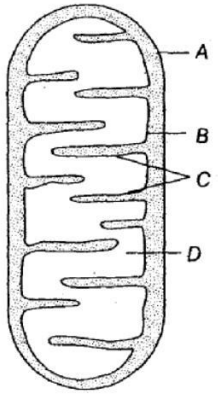
71. The figure given below shows an organelle.



(i) Name the organelle.
(ii) In which cell this structure is present?
(iii) What is the function of the structure?
(iv) Label the parts *A-D*.

Ans. (i) Chloroplast
(ii) Plant cell
(iii) To carry out photosynthesis
(iv) *A*. Grana
B. Inner membrane
C. Stroma
D. Outer membrane

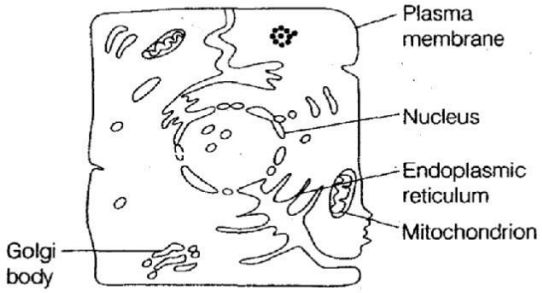
72. Observe the figure shown below and answer the following
(i) Label the parts marked *A-D*.
(ii) What does this figure represent?
(iii) Mention the role performed by this structure in the cell.



Ans. (i) *A*. Outer membrane
B. Inner membrane
C. Cristae
D. Matrix
(ii) It is the structure of mitochondrion.
(iii) It participates in cellular respiration and produces energy.

73. The diagram shows some of the structures present in an animal cell. Which of these structures is responsible for
(i) Manufacture of lipids and steroids
(ii) Release of energy

(iii) Manufacture of hormones and digestive enzymes
(iv) Production of spindle fibres in cell division
(v) Endo and exocytosis?



Ans. (i) **Golgi body** It is responsible for the manufacture of lipids and steroids.

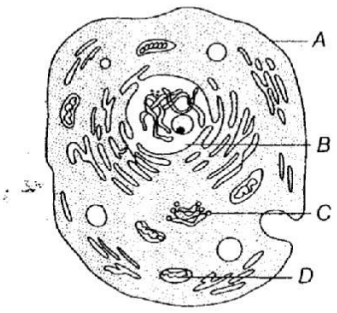
(ii) **Mitochondrion** It generates energy for various activities of cell.

(iii) **Lysosomes** It is responsible for the production of hormones and digestive enzymes.

(iv) **Centrioles** It is responsible for the production of spindle fibres.

(v) **Plasma membrane** It is responsible for endo and exocytosis.

74. Study the figure given below of an animal cell and answer the following questions.



(i) Label the parts *A-D*.
(ii) Name a structure in this cell that is absent in plant cell.
(iii) What is the function of labelled part *B* in the physiological activity of the cell.
(iv) Write one function of cell structure labelled *D*.

Ans. (i) *A.* Cell membrane *B.* Nucleus
C. Golgi body *D.* Mitochondrion

(ii) Centriole

(iii) Controls cellular activities.

(iv) It is the powerhouse of a cell and produces energy by respiration.

CHAPTER -3 (TISSUES: PLANT AND ANIMAL TISSUES)

Q1. Name the kind of tissue found

a) At the tip of plant roots-apical meristem
b) At the lower surface of leaf-epidermis
c) In the inner lining of intestine-columnar epithelium
d) At the joint between two long bones-ligament
e) In the walls of the veins of leaves-sclerenchyma
f) As gritty masses in the skin of pears-sclerenchyma(stone cells)

Q2. Where is the least specialized tissue located in plants . . . . in the cortex of roots and ste
the pith, in the mesophyll of leaves

Q3. Give one word for each of the following:

a) A group of similar cells performing a specific function—tissue
b) Cells least specialized in the plants—parenchyma
c) Cells responsible for increase in diameter of stem and root of dicot plants—l
meristem(cambium)

Q4. Name one place each in living organisms where the following tissues are located:

a) Meristematic tissue—apex of root and shoot
b) Cartilage----pinna
c) Squamous epithelium—outermost layer of skin
d) Sclerenchyma---in the veins of leaves
e) Ciliated epithelium---lines the trachea internally
f) Ligament between two bones

Q5. Name the kinds of cells found in the following places:

a) Surface of the human skin--- stratified squamous epithelium
b) Salivary gland----cuboidal epithelium
c) Brain---neurons
d) Inner lining of the windpipe----ciliated epithelium

Q6. Name any one body part where ciliated epithelium is found in humans?What is its functio
Ans. Ciliated epithelium is found in the inner lining of trachea.The cilia show lashing move
and drive out mucus and other foreign substances from the trachea

Q7. What is the difference between the nervous tissue and the nervous system?
Ans. Nervous tissue—It is a kind of animal tissue which is made up of neurons
Nervous system--- It is an organ system which is made of different organs that work tog
in a coordinated manner to perform a specific function

Q8. List the tissues found in the human heart.
Ans. Epithelial,muscular,connective and nervous

Q9. Can you consider a cluster of eggs as a tissue? Why?
Ans. No.we cannot consider a cluster of eggs as a tissue because the cells in a tissue work tog
to perform a specific function but in a cluster of eggs ,each cell perfoms its fun

individually. Moreover the cells in a tissue are bound by a cementing substance whi
lacking in a cluster of eggs.

Q10. Name the three kinds of muscles found in the human body.ln each case, name one region
body where they are found.

Ans. Striated muscle ---limbs,face,neck
Unstriated muscle---walls of alimentary canal
Cardiac muscle--- in the heart

Q11. What is the difference between

Ans. a) Cell and tissue

Cell—It is the structural and functional unit of life

Tissue---it is a group of cells of similar kind which performs a specific function

b) Organ and organism

Organ—It is a group of tissues of different kinds which work together in a coordi
manner to perform a specific function

Organism—It is a living entity whose body may be made up of a single cell,
cells,tissues,organs or organ systems and is capable of leading an independent exis

c) Organ and organ system

Organ—group of tissues of different kinds capable of performing a specific fun
when they work in a coordinated manner

Organ system—It is made up of different organs which work together in a coordi
manner to perform a specific function

012. Differentiate between cells of:

Ans. a) Parenchyma and collenchyma,

Parenchyma—cell wall is thin and made up of cellulose,living isodiametric
Collenchyma---cell wall thickened at the corners due to cellulose and pectin ,
cells comparatively longer than broad with rounded ends

b) Meristematic tissue and, permanent tissue

Meristematic tissue—living tissue ,thin cell wall ,cells have the power of cell div
,cells are undifferentiated

Permanent tissue—may be living or dead ,cell wall thin or thick ,lack the power o
division ,cells are differentiated

c) Sclerenchyma and parenchyma

Sclerenchyma—dead cells ,cells are long narrow and tapering at the ends ,cell w
thin and made up of cellulose

Parenchyma—living cells, isodiametric, cell wall is evenly thickened due t
deposition of lignin

d) Cells of involuntary and voluntary muscle

Involuntary muscle—spindle-shaped ,Iong and narrow ,uninucleated ,striations abs

Voluntary muscle—long and cylindrical ,multinucleated, striations present

e) Fibres of voluntary muscle and cardiac muscle

Voluntary muscle---multinucleated ,unbranched ,get fatigued easily Cardiac mus
uninucleated ,branched, does not get fatigued

Name the following:

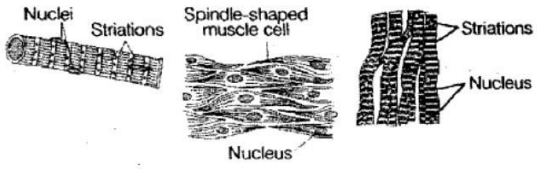
1. The tissues responsible for conduction of water and minerals in pla
2. The tissue which conducts food in plants.
3. A group of similar cells which performs a specific function.
4. The study of tissues.

A)1.Xylem 2.Phloem 3.Tissues 4.Animal tissues...Histology
Plant tissues....Plant Anatomy

63. Differentiate between various types of muscular tissues. Draw appropriate diagram.

Ans. Differences between various types of muscular tissues are as follows

Characteristics	Striated muscle	Smooth muscle	Cardiac muscle
Movement	Voluntary (under our control)	Involuntary (not under our control)	Involuntary
Shape of cells	Long, cylindrical and unbranched	Long with pointed ends (spindle-shaped)	Cylindrical and branched
Microscopic feature	Alternate light or dark bands present	No such bands found	No such bands found
Nucleus	Multinucleate	Uninucleate	Uninucleate
Location	Limbs of our body	Alimentary canal, iris of the eye, in uterus and bronchi of lungs	Heart



e 5 Marks Questions

64. List any five characteristics of parenchyma.

Ans. Major characteristics shown by parenchyma are as follows

(i) The cells of parenchyma are living and possess the power of division.

(ii) The cells are loosely packed with large intercellular spaces in between them.

(iii) It is found in soft parts of plant such as cortex of roots, ground tissue in stem and mesophyll cells of leaves.

(iv) It serves as a packing tissue to fill the spaces in between other tissue and maintain the shape of plants.

(v) It stores waste products of plant such as tannin, gum, crystals, etc.

65. Explain a nerve cell with a diagram.

Ans. Nerve cell consists of a cell body called cyton. It contains cytoplasm and a nucleus. Some cytoplasmic projections arise from the cyton called as dendrons which again branch into dendrites. One of the dendrons is longer than others and is called axon. Axon is surrounded by a sheath called myelin sheath. Myelin sheath is broken a intervals to form some constriction called node of ranvier. The myelin sheath is covered by a neurilemma.

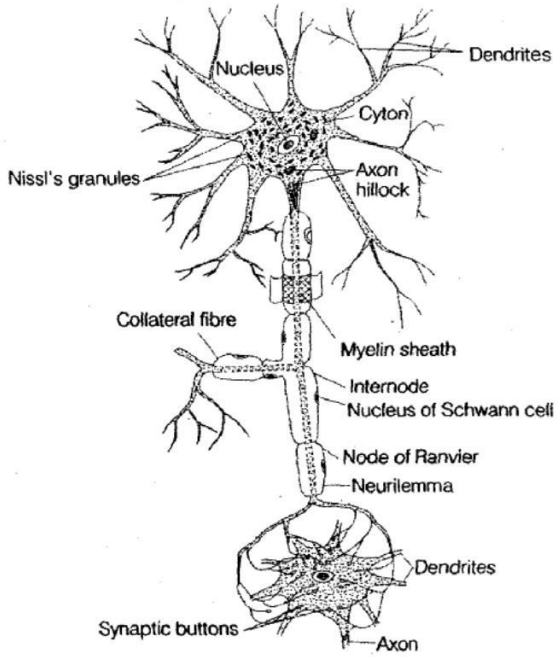
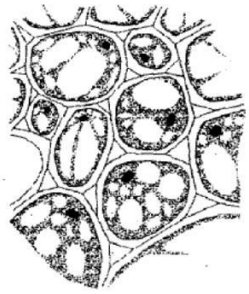


Diagram Based Questions

66. (i) Identify the tissue given in following figure.



(ii) Infer the characteristic features of these cells.

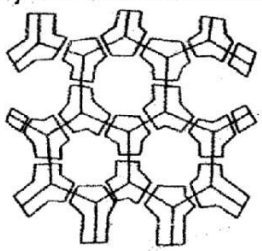
(iii) Suggest any two parts of the plant where such cells are present.

Ans. (i) It is parenchyma.

(ii) It consists of thin-walled unspecialised cells which are loosely packed, e.g. having simple intercellular spaces. Each cell has a prominent nucleus.

(iii) (a) Root (b) Stem

67. (i) Identify the tissue shown in the figure.



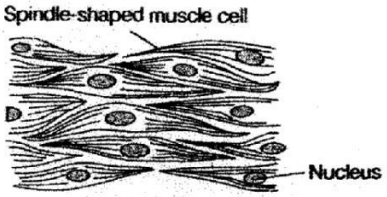
(ii) Specify any parts of the plant where such cells are present.

Ans. (i) Sclerenchyma

(ii) Sclerenchymatous cells are found in

(a) vascular bundles (b) veins

68. Observe the following figure and answer the following questions.



(i) What is shown in figure?

(ii) What is the function of this tissue?

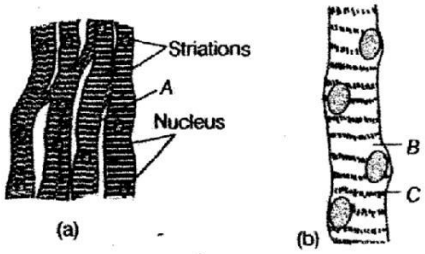
(iii) Name some organs where this tissue is located.

Ans. (i) The figure shows smooth muscle cells.

(ii) Smooth muscle tissue facilitates the movements in involuntary organs.

(iii) Intestine, stomach, etc.

69. (i) Identify diagrams (a) and (b).



(ii) Label *A*, *B* and *C*.

(iii) Which one of them acts as impulse booster?

(iv) Which one of them is under control of our will?

Ans. (i) Figure (a) is cardiac muscle fibres.

Figure (b) is skeletal or striated muscle fibres.

(ii) *A*-Intercalated disc; *B*-Light band; *C*-Dark band

(iii) Intercalated disc acts as an impulse booster.

(iv) Skeletal or striated muscle is under control of our will.

CHAPTER — 4 (THE FLOWER)

Q1. Explain the following terms:

Ans. a) Incomplete flower-A flower is said to be incomplete if one or more floral whorls are missing in it

b) Staminate flower—A unisexual flower which contains only the stamens

c) Pistillate flower—A unisexual flower which contains only the pistil or carpels
d) Bisexual flower—A flower which contains both stamens and carpels

Q2. Distinguish between the following pairs:

Ans. a) Flower and inflorescence

Flower-it is a modified shoot in which the internodes are highly condensed and the leaves are modified into floral whorls

Inflorescence-it is the mode of arrangement of flowers on the axis of the plant b) Petals and Petaloid sepals

Petals-individual units of corolla whorl which are brightly coloured to attract pollinators. Petaloid sepals-sepals which are brightly coloured like the petals

Q3. Where are the following structures located and what are their functions?

Ans. a) Placenta

Location-the swollen region in the ovary Function-
help in the attachment of ovule to the ovary

b) Thalamus

Location-the expanded tip of pedicel

Function-the floral parts are borne on the thalamus

c) Anther

Location-attached to the extremity of the filament or on top of the filament Function-produces pollen grains which contain the male gamete

d) Stigma

Location- tip of the pistil

Function-landing place for the pollen grains

Q4. Why are the following described as stated:

a) The androecium of pea flower is diadeiphous

Ans. The filaments of pea flower are united in two bundles while anthers are free
b)Ray florets of sunflower as neuter

Ans. The ray florets of sunflower are without the androecium and gynoecium whorls
c)Salvia sepals are petaloid

Ans. ln salvia,the sepals are brightly coloured like the petals
d)China rose stamens are epipetaloid

Ans. .ln chinarose, the filaments are attached to the petals.Hence it is epipetaloid in nature

Q5. What are bracts? State their function.

Ans. They are modified leaves or scales,with a flower or flower cluster in their axil. They are usually different from foliage leaves .They may be smaller, larger, or of different colour, shape or texture.Some bracts are brightly coloured and serve the function of attracting pollinators

Q6. Explain the terms:

Monadelphous- A condition in which the filaments are united to form a single bundle and anthers are free e.g.-chinarose

Diadelphous—A condition in which the filaments are united to form two bundles and anthers are free. e.g. pea

Polyadelphous—A condition in which the filaments are united to form several bundles and anthers are free e.g. Bombax

Study the figures given and answer the questions that follow:

Q.1. (*i*) Label the parts 1 to 5 in the figure.

(*ii*) Name the structure shown in the figure.

(*iii*) Is it belong to gynoecium or androecium?

Ans. (*i*) 1. Stigma; 2. Style; 3. Ovary; 4. Ovule; 5. Thalamus.

(*ii*) It is a carpel.

(*iii*) It belongs to gynoecium.

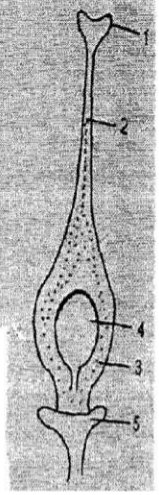


Diagram Based Questions

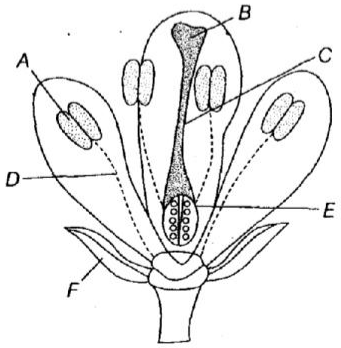
0. Study the given diagram and answer the following questions.

(i) Name the part marked as *A-F.*

(ii) Which part produces pollen grains?

(iii) Which part receives pollen grains?

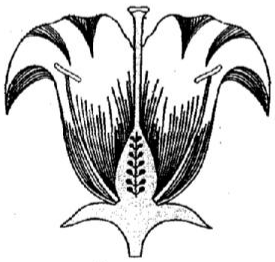
(iv) Which part develops into fruit after fertilisation?



Ans. (i) *A*-Anther *B*-Stigma *C*-Style
D-Filament *E*-Ovary *F*-Calyx

(ii) Anther (iii) Stigma (iv) Ovary

41. The figure shows a type of ovary.



(i) Name the ovary.

(ii) Give reason to support the answer.

(iii) Name a plant in which this ovary is present.

Ans. (i) Hypogynous

(ii) The ovary is located above the thalamus and the floral whorls are below the ovary.

(iii) China rose, mustard, brinjal.

Answers

1. A flower which contains all the four whorls is called a complete flower, e.g. rose.
2. A flower which contains both male and female reproductive parts, e.g. rose.
3. A flower which contains either male or female reproductive part is called unisexual, e.g. ray florets and disc florets of *Chrysanthemum*.
4. The stalk of a flower.
5. The condition in which calyx and corolla cannot be distinguished.
6. A tissue present in the wall of the ovary where ovules are attached.
7. The condition where all the petals are free.
8. A flower which contains only female reproductive part, e.g. ray floret of *Chrysanthemum*.
9. A flower in which stamens and pistil are not present.
10. When the stamens are united in one group, it is called monadelphous.
11. When the stamens are arranged in two bundles it is called diadelphous.
12. When the stamens are arranged in several groups, it is called polyadelphous.

Distinguish between the following:

Q.1. Calyx and Corolla

Ans.

Calyx	*Corolla*
(*i*) The outermost whorl.	(*i*) Inner to the calyx.
(*ii*) Consists of sepals.	(*ii*) Consists of petals.
(*iii*) Protects the inner parts of a flower.	(*iii*) Attract insects for pollination.

Q.3. Ovary and Ovule

Ans.

Ovary	*Ovule*
(*i*) The swollen basal part of the pistil.	(*i*) Present in the ovary.
(*ii*) Changes into fruit after fertilization.	(*ii*) Changes into seed after fertilization.

Q.4. Style and Filament

Ans.

Style	*Filament*
(*i*) It is a part of female flower.	(*i*) It is a part of male flower.
(*ii*) It holds stigma.	(*ii*) It holds anther.

Name:

1. Gynoecium of a flower in which carpels are free.
2. A bisexual flower/Hermaphrodite.
3. The male reproductive organ of the flower.
4. Coloured sepals.
5. A monocot plant which contains female and male flowers on the same plant.
6. A plant with an inferior ovary/Epigynous.
7. The most attractive part of the flower.
8. A condition in which the sepals are free.
9. A condition in which the petals are united.
10. A term used for fused sepal and petal.
11. A pistil with many carpels.
12. The female reproductive part of the flower.
13. A leaf that develops in the axil of a flower.
14. The expanded tip of the pedicel bearing floral parts.

Answers

1. Apocarpous
2. China rose
3. Stamen
4. Petaloid sepals
5. Maize
6. Sunflower
7. Petals
8. Polysepalous
9. Gamopetalous
10. Perianth
11. Polycarpellary
12. Pistil
13. Bract
14. Thalamus

Complete the following:

1. The whorl of floral leaves outside the sepal is called ..... .
2. A flower which contains only male parts (stamen) is called ..... .
3. A pistil which contains two carpels is ..... .
4. A group of flowers arranged on a twig is called ..... .
5. [redacted]

Answers

1. Epicalyx
2. Staminate
3. Bicarpellary
4. Inflorescence

Define the terms:

1. Complete flower
2. Bisexual
3. Unisexual
4. Pedicel
5. Perianth
6. Placenta
7. Polypetalous
8. Pistillate
9. Neuter flower
10. [illegible]
11. Diadelphous stamens
12. Polyadelphous

CHAPTER-5(POLLINATION AND FERTILIZATION)

Q1. Explain the following terms:

e) Ornithophily—A type of pollination brought about by birds e.g.canna,Bignonia
f) Elephophily—A type of pollination brought about by elephants e.g. Rafflesia

g) Artificial pollination—pollination brought about by man.ln this process the anthers are removed from the bisexual flowers at a very young stage.This is known as emasculation.Then the stigma is covered with plastic bags to prevent unwanted pollen grains from landing on it.This is called bagging.Finally, pollen of desired variety is sprinkled on the matured stigma.

Q2. What happens to the following after fertilization?

a) Ovules--- seeds

b) Calyx---wither or may remain intact as persistent calyx
c) Petals—wither

d) Stamens—wither

Q3. Mention the contrivances in flowers which favour cross pollination **Ans.** a) dichogamy b)herkogamy c) heterostyly d) unisexuality e) self sterility

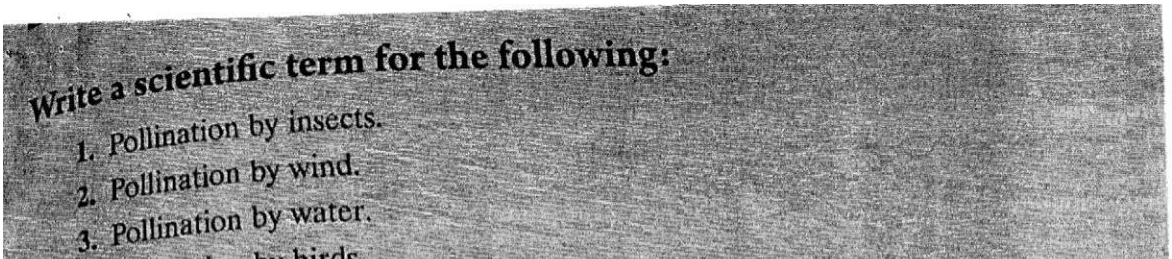
Q4. What are the advantages of the following in the flower to the plant concerned?

a) Long and feathery stigma—traps pollen grains during wind pollination
b) Brightly coloured petals—attract pollinators

c) Smooth and light pollen—can be easily carried by wind

d) Protruding and easily movable anthers—slightest wind will dislodge the pollen grains in the anthers

e) Fragrant nectar---to attract pollinators


Write a scientific term for the following:
1. Pollination by insects.
2. Pollination by wind.
3. Pollination by water.

Answers

1. Entomophily
2. Anemophily
3. Hydrophily
4. Ornithophily
5. Zoophily
6. Homogamy
7. Fertilisation
8. Seed
9. Self-pollina tion
10. Fertilisation
11. Dichogamy
12. Triple fusio

13. Heterostyly

Give one example for each of the following:

1. A wind pollinated flower.
2. A flower which shows cleisto gamy.
3. A water pollinated flower.

Answers

1. Maize
2. Pansy
3. Hydrilla, Vallisneria

Fill in the blanks:

1. Cross-pollination takes place in all _____ plants.
2. Persistent calyx is present in _____.
3. Double fertilisation is normally seen in _____.
4. The outer wall of pollen grain is called _____, while the inner wall is _____.
5. The pollen tube enters the ovule through the _____.
6. The fusion product of male and female gamete is called _____.
7. After fertilisation the ovules change into _____.
8. _____ helps to transfer the male gametes through the style into the ovary.

nswers

1. Monoecious
2. Lady's finger/Brinjal
3. Angiosperms
4. Exine, intine
5. Micropyle
6. Zygote
7. Seeds.
8. Pollen tube

ate the difference between:

1. Self-pollination and cross-pollination.

ns.

Self-pollination	Cross-pollination
(*i*) External agent is not required.	(*i*) External agent is required.
(*ii*) Flowers must be bisexual.	(*ii*) Flowers may be unisexual or bisexual.
(*iii*) Anther and carpel mature at the same time.	(*iii*) Anther and carpel mature at different times.
(*iv*) Preserve the parental characters.	(*iv*) Do not preserve the parental characters.
(*v*) Pollen grains are produced in less quantity.	(*v*) Pollen grains are produced in large quantity.

Q.2. Wind pollination and insect pollination.

ns.

Wind Pollination	Insect pollination
(*i*) Flowers are mostly dull coloured, without odour, nectar, etc.	(*i*) Flowers are brightly coloured with scent and nectar.
(*ii*) Have long, feathery, or sticky stigma.	(*ii*) Stigma neither feathery nor sticky.
(*iii*) Pollen grains are produced in large number.	(*iii*) Less number of pollen grains are produced.
(*iv*) Pollen grains are light and non-sticky.	(*iv*) Pollen grains are sticky and large.

Q.3. Pollination and Fertilisation.

Ans.

Pollination	Fertilization
(*i*) Transfer of pollen grains from the anther to the stigma of a flower.	(*i*) Fusion of male gamete and the egg nucleus.
(*ii*) Pollinating agents are needed.	(*ii*) No agents are needed.
(*iii*) It occurs on the stigma of a flower.	(*iii*) It occurs in the ovules of the flower.
(*iv*) It leads to fertilization.	(*iv*) It leads to the formation of fruits and seeds

Q4. Herkogamy and Heterostyly

Ans.

Herkogamy	Heterostyly
Mechanical barrier is present to prevent the pollen to reach the stigma of the same flower, e.g. Pansy.	No mechanical barrier is present instead the stigma and anther mature at different times, e.g. *Oxalis*.

Multiple Choice Questions

1. Maize is pollinated by:
   (*a*) Bird (*b*) Wind (*c*) Bees (*d*) Water
2. Ornithophily refers to pollination by.
   (*a*) Bird (*b*) Insects (*c*) Water (*d*) Elephant.
3. Double fertilization is the fusion of:
   (*a*) egg cell and two male gametes
   (*b*) egg by one male gamete, and another with two polar nuclei.
   (*c*) Both of these.
   (*d*) one polar nucleus with the other and with male gamete.
4. Pollen grains of flowers, pollinated by insect is:
   (*a*) rough and sticky (*b*) rough and dry.
   (*c*) smooth and dry (*d*) large and showy.

Ans. 1. (*b*) 2. (*a*) 3. (*b*) 4. (*a*)

(iv) It helps in pollination through wind.

(v) It is an adaptation for cross-pollination.

(vi) It helps in pollination by wind.

55. Describe the process of double fertilisation in flower.

Ans. **Double fertilisation** It occurs after the pollen tube reaches the ovary. It is the characteristic of angiosperms.

(i) Pollen tube releases two male gametes into the cytoplasm of a synergid.

(ii) One of the male gamete fuses with egg cell (syngamy) which results in the formation of zygote.

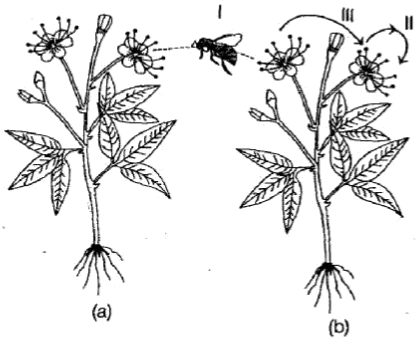
(iii) Second male gamete fuses with two polar nuclei to form a triploid Primary Endosperm Nucleus (PEN). This is called triple fusion.

(iv) Since, two fusions, i.e. syngamy and triple fusion occur in an embryo sac, this is called double fertilisation.

(v) Central cell and primary endosperm nucleus called as Primary Endosperm Cell (PEC) develops into the endosperm and zygote develops into an embryo.

Diagram Based Questions

56. Look at the figure below and answer the questions that follows.



(i) Identify the processes I, II and III.

(ii) Which type of process occurs in a unisexual and cleistogamous flower, respectively?

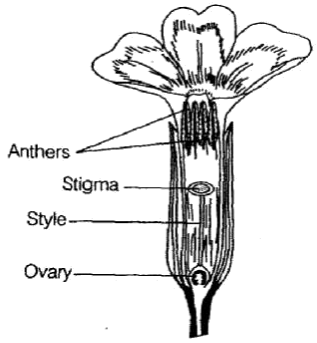
Ans. (i) I.–Cross-pollination

II.–Self-pollination (Autogamy)

III.–Geitonogamy.

(ii) In unisexual flower, process I occurs while in a cleistogamous flower, process II occurs.

57. In the figure given below, the flower has short style and highly placed anthers.



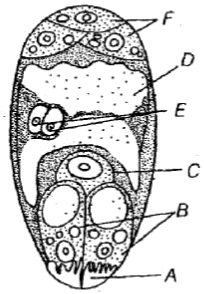
(i) Which type of pollination is most likely to occur?

(ii) What is the phenomenon known as ?

Ans. (i) In such flowers, cross-pollination is likely to occur.

(ii) The phenomenon is known as heterostyly where the flowers may be of two or more types with regard to the length of the style and lengths of stamens.

58. Identify *A-F* in the diagram.



Ans. *A*–Filiform apparatus, *B*–Synergids, *C*–Egg cell, *D*–Central cell, *E*–Polar nuclei, *F*–Antipodal cell

CHAPTER-6 (SEEDS—STRUCTURE AND GERMINATION)

Q1. What is the difference between an embryo and a seed?

Ans. Embryo—It is formed by the fusion of sperm nucleus and egg nucleus.It is found inside a seed
Seed—It is a ripened ovule formed after fertilization..It contains the embryo,the cotyledon(s) and endosperm(if any)

Name:

1. The opening through which water enters into a seed.
2. The region of the axis between the point of attachment of cotyledons and plumule.
3. Type of germination in which seed germinates inside the fruit while it is attached to the plant
4. The protein layer outside scutellum.
5. The outermost layer of the seed coat.

Answers

1. Micropyle 2. Epicotyl 3. Viviparous germination 4. Aleurone layer 5. Testa

Fill in the blanks:

1. The seed absorbs water through _____ .
2. Maize is an _____ seed.
3. In epigeal germination _____ elongates faster.
4. The seed is a ripened _____ .
5. In hypogeal germination _____ elongates faster.
6. _____ is the protective layer of the radicle.
7. In _____ germination the cotyledons are pushed above the soil.
8. _____ is an example of non-endospermic seed.
9. _____ , _____ , _____ and _____ are needed for germination.

Answers

1. Micropyle 2. Monocotyledonous/ Endospermic 3. Hypocotyl
4. Ovule 5. Epicotyl 6. Coleorhiza
7. Epigeal 8. Bean/Pea 9. Water, air, light and optimum temp

State the functions of the following:

1. **Seed coat:** It protects the embryo.
2. **Radicle:** Changes into root system.
3. **Plumule:** Changes into shoot system.
4. **Endosperm:** It stores food.
5. **Micropyle:** Water and air enter into the seed through micropyle.
6. **Cotyledon:** To provide food material to the growing embryo.
7. **Pyrogallic acid:** It is the chemical that absorbs oxygen.

Q 2. Give any two examples each of endospermic seeds and non-endospermic seeds

Ans. endospermic seeds/albuminous seeds—rice, maize, castor
Non-endospermic seeds/exalbuminous seeds---bean, pea, gram

Q 3. Germinated grams are considered highly nutritive. What is the reason for this belief?

Ans. Germinated grams are considered highly nutritive because of high concentration of carbohydrates and proteins in sprouting stage and also because they are easily digestible

Q 4. Why do we not use the terms maize fruit and maize seed?What do we say instead?

Ans. We use the term maize grain instead of maize fruit or maize seed because in it the pericarp testa remain fused together.

Q 5. What are the functions of the following in a seed?

Ans. a) Seed coat—protects the seed from mechanical injuries and from invasion of germs
b) Micropyle—serves as an opening for the diffusion of respiratory gases and also helps absorption of water to make it available to the embryo for germination
c) Cotyledons—store food for the embryo within a seed
d) Radicle—forms the future root system
e) Plumule—forms the future shoot system

Q 6. Differentiate between coleorhiza and coleoptile

Ans. Coleorhiza-located towards the narrower end of the maize grain,forms the protective shea the radicle
Coleoptile—located towards the broader end of the maize grain, forms the protective shea the plumule

Q 7. Differentiate between germination and vivipary

Ans. Germination—It is a process in which the embryo inside a seed gets activated to fo seedling
Vivipary—It is a special mode of germination in which the seed germinates inside the while it is still attached to the parent plant

Q 8. What is the role played by the hypocotyl in epigeal germination?

Ans. ln epigeal germination,the arched hypocotyl grows forming a loop above the soil, it straightens, bringing the cotyledons above the soil.

State the difference between the following:

Q.1. Bean seed and Maize grain.

Ans.

Bean seed	*Maize grain*
(*i*) Dicotyledonous seed.	(*i*) Monocotyledonous seed.
(*ii*) Fruit wall and seed coat are separate.	(*ii*) Fruit wall and seed coat are fused together to form a single protective layer.

Q.2. Albuminous and Ex-albuminous seed.

Ans.

Albuminous seed	*Ex-albuminous seed*
(*i*) Food is stored in endosperm.	(*i*) Food is stored in cotyledons, endosperm is absent.
(*ii*) Cotyledons are thin.	(*ii*) Cotyledons are thick.

Q.3. Epigeal and Hypogeal germination.

Ans.

Epigeal germination	*Hypogeal germination*
(*i*) Cotyledons are pushed above the soil.	(*i*) Cotyledons remain in the soil.
(*ii*) Hypocotyl elongates faster.	(*ii*) Epicotyl grows faster.

Q.4. Monocotyledonous and Dicotyledonous seed.

Ans.

Monocotyledonous seed	*Dicotyledonous seed*
(*i*) Only one cotyledon is present.	(*i*) Two cotyledons are present.
(*ii*) Mostly contains fibrous root and parallel venation, e.g. Coconut.	(*ii*) Contains tap root and reticulate venation e.g. Bean.

Q.5. Hypocotyl and Epicotyl.

Ans.

Hypocotyl	*Epicotyl*
(*i*) It lies below the point of attachment of cotyledons.	(*i*) It lies above the point of attachment of cotyledons
(*ii*) It contains radicle.	(*ii*) It contains plumule.

Germination of pea seed

Q.10. Ploughing is done in a field before sowing seeds. Why?

Ans. Ploughing helps to aerate the soil, i.e. makes oxygen easily available to the seeds, which is an essential requirement for germination.

Q.11. It is commonly observed that potatoes kept in a basket during late rainy season start giving out small shoots. Would you consider it germination? Give reason to support your answer.

Ans. Yes, it is considered germination as potato is a tuber, which has auxillary buds and it starts to germinate under favourable conditions of temperature, water and light.

Brain Teasers

Q.1. We use the term maize grain for maize seed. Why?

Ans. In maize, the seed coat and fruit wall (pericarp) are fused together. So, it is called as maize grain.

Q.2. Seeds sown deep in soil mostly fail to germinate. Give reason.

Ans. For germination, oxygen and light are needed. Deep in the soil sufficient air and light are not there. So, seeds sown deep in soil mostly fail to germinate.

CHAPTER-7 (RESPIRATION IN PLANTS)

Q 1. What happens to the energy liberated in respiration?

Ans. The energy liberated in respiration is used for cell division,for movement and locomotion,for maintaining a constant body temperature and for other physiological functions

Q 2. Why is it usually difficult to demonstrate respiration in green plants?

Ans. lt is difficult to demonstrate respiration in green plants placed in sunlight because the carbon dioxide evolved during respiration would be utilized by the green plant for photosynthesis.So we cannot prove that respiration has occurred as the end product would be used up.

Q 3. How is tilling of the soil useful for the crops growing in it?

Ans. Tilling or ploughing loosens up the soil particles and creates tiny air spaces around them which can hold oxygen to be absorbed by the roots for respiration.

Q 4. Write the full form of ATP and ADP

Ans. ATP — adenosine triphosphate

ADP — adenosine diphosphate

Q 5. Can cell respiration occur in any organism at a temperature of about 65°C? Give reason. **Ans.** No,.it cannot occur.This is because the enzymes which catalyse the process get denatured at such a high temperature

.

Q 6. How do the following structures help in respiration in plants?

Ans. lenticels—since they are found on the surface of old and woody stems and remain open all the time they help in diffusion of respiratory gases

Stomata---these openings are found in the epidermis of leaves and usually remain open during daytime.so they act as inlets for oxygen to be used in respiration

Root hairs---these neither have the lenticels nor the stomata.so their general surface is meant for diffusion of respiratory gases

Distinguish between the following pairs:

Q1. Respiration and Combustion.

Ans.

Respiration	*Combustion*
(*i*) It takes place in living cells.	(*i*) Living cells are not needed for this process.
(*ii*) It is a slow process.	(*ii*) It is a fast process.
(*iii*) It is a biochemical process. Breakdown of organic matter is controlled by enzymes.	(*iii*) It is a physico-chemical process. Enzymes are not needed.
(*iv*) Less heat is produced.	(*iv*) More heat is produced.

Q2. Aerobic and Anaerobic Respiration.

Ans.

Aerobic respiration	*Anaerobic respiration*
(*i*) It takes place in the presence of oxygen.	(*i*) It takes place in the absence of oxygen.
(*ii*) It involves the complete breakdown of glucose.	(*ii*) It involves the incomplete breakdown of glucose.
(*iii*) It takes place in cytoplasm and mitochondria.	(*iii*) It takes place in cytoplasm.
(*iv*) Its products are CO_2 and H_2O.	(*iv*) Its products are ethyl alcohol and CO_2.

Q3. Fermentation and Anaerobic respiration.

Ans.

Fermentation	*Anaerobic respiration*
(*i*) It takes place in micro-organisms.	(*i*) It takes place in higher plants and animal tissues without oxygen.
(*ii*) It is extracellular.	(*ii*) It is intracellular.

Q.4. Glycolysis and Kreb's cycle.

Ans.

Glycolysis	*Kreb's cycle*
(*i*) It takes place in cytoplasm.	(*i*) It takes place in mitochondria.
(*ii*) Pyruvic acid is produced during glycolysis.	(*ii*) Pyruvic acid is used in Kreb's cycle.

Q.5. Respiration and Photosynthesis.

Ans.

Respiration	*Photosynthesis*
(*i*) It takes place in all living cells.	(*i*) It takes place only in chlorophyll bearing cells.
(*ii*) It is a catabolic process.	(*ii*) It is an anabolic process.
(*iii*) CO_2 is given out.	(*iii*) O_2 is given out.
(*iv*) It takes place at all time.	(*iv*) It takes place in day time only.

Answer the following questions:

Q.1. What is respiration?

Ans. It is the stepwise oxidation of glucose in the living cells to produce energy.

Q.2. What are the phases of respiration?

Ans. Glycolysis, Kreb's cycle, Respiratory chain or Electron transport chain.

Q.3. What is aerobic respiration?

Ans. The complete breakdown of glucose in the presence of oxygen is called aerobic respiration.

Q.4. What is anaerobic respiration?

Ans. The incomplete breakdown of glucose in the absence of oxygen is called anaerobic respiration.

Q.5. What is glycolysis?

Ans. The sequence of reactions which convert glucose to pyruvic acid with the production of ATP is called glycolysis.

Q.6. What is Kreb's cycle?

Ans. The cycle in which pyruvic acid formed during glycolysis is oxidised into CO_2 and H_2O.

Q.7. What is fermentation?

Ans. The incomplete breakdown of glucose to ethyl alcohol and CO_2 by micro-organisms is called fermentation.

Q.8. Write an equation to represent aerobic and anaerobic respiration.

Ans. Aerobic – $\underset{\text{Glucose}}{C_6H_{12}O_6} + \underset{\text{Oxygen}}{6O_2} \xrightarrow{\text{Enzyme}} \underset{\text{Carbon dioxide}}{6CO_2} + \underset{\text{Water}}{6H_2O} + 38\,ATP$

Anaerobic – $\underset{\text{Glucose}}{C_6H_{12}O_6} \xrightarrow{\text{Enzyme}} \underset{\text{Ethyl alcohol}}{2C_2H_5OH} + \underset{\text{Carbon dioxide}}{2CO_2} + 2ATP$

Q.9. How is the tilling of the soil useful for the crops?

Ans. Tilling makes the soil porous and airy. The underground parts of plants get sufficient oxygen.

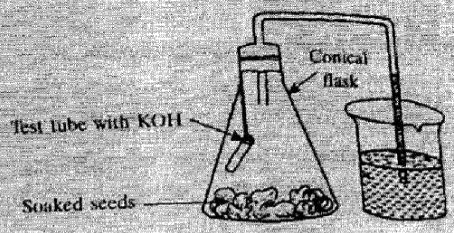
Q.10. Write the full form of ATP and ADP.

Ans. Adenosine triphosphate - ATP

Adenosine diphosphate - ADP

Diagram based questions:

Q.1. The figure alongside represents an experimental set-up.



(*i*) What is the aim of the experiment?

(*ii*) Why has the water in the tube been risen?

(*iii*) What is the purpose of KOH?

(*iv*) Is there any control for this experiment? If so, mention it.

(*v*) What precautions should be taken for this experiment?

Ans. (*i*) The aim of the experiment is to show that respiration takes place in germinating seeds.

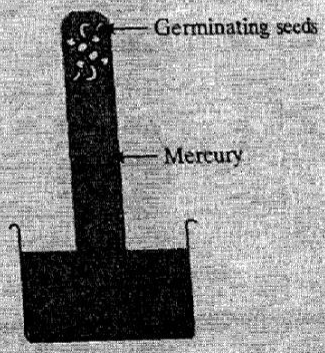
(*ii*) Seeds use oxygen for respiration and a vacuum is created in the tube and water has been risen.

(*iii*) To absorb CO_2 released by the seeds.

(*iv*) Yes. Take another conical flask with boiled seeds.

(*v*) The flask should be airtight.

Q.2. The following diagram shows an experimental set-up demonstrated in plants:



(*i*) What is the aim of the experiment?

(*ii*) Write an equation for the process mentioned in (*i*) above.

(*iii*) Name a plant which respires anaerobically.

Ans. (*i*) To show that CO_2 is liberated during anaerobic respiration.

(*ii*) $C_6H_{12}O_6 \longrightarrow 2C_2H_5OH + 2CO_2 + 2$ ATP.

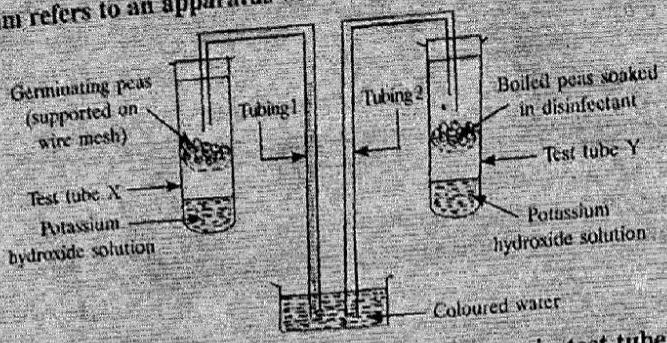
(*iii*) Bacteria/Yeast.

Q.3. How will you show that heat is given out during respiration?

Ans. Take two thermos flasks A and B. Keep some germinating seeds in A and dry seeds in B. Insert thermometer in each flask. Close the mouth of the flasks with cork. Note the initial temperature After two days again note the temperature. There is a rise in temperature in flask A showing tha germinating seeds respire and produce heat. While in flask B no change is there since the flas contain dry seeds.

(vi) Mercury level would rise proving [illegible]

Q.5. The following diagram refers to an apparatus which is used to demonstrate a physiological process:



(i) What is the purpose of keeping potassium hydroxide solution in test tubes X and Y?

(ii) What is the purpose of keeping boiled peas soaked in a disinfectant in test tube Y?

(iii) Why has coloured water risen in tubing?

(iv) Name the biological process which causes the above rise.

(v) Define the biological process shown in the experiment.

Ans. (i) To absorb CO_2 produced during respiration.

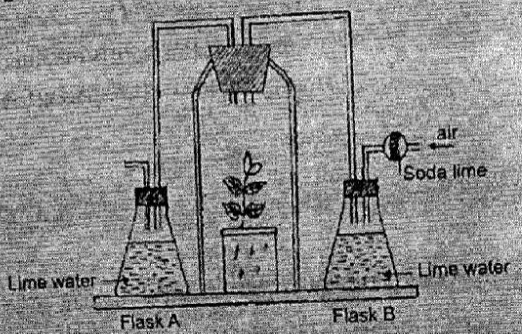
(ii) If these are not soaked in disinfectant the bacterial growth may be there in the tube Y and accurate result may not get due to bacterial respiration.

(iii) The germinating peas respire and O_2 is used which creates a vacuum in the tube. So coloured water has risen in the tubing I.

(iv) Respiration

(v) It is the step wise oxidation of glucose in the living cells to release energy.

Q.6. The apparatus given was set-up to demonstrate a particular process occurring in plants. Study the same and then answer the questions that follow.



(i) Name the process.

(ii) What is the object of the experiment?

(iii) Why is soda lime placed in the tube?

(iv) What change, if any, would you observe in the lime water in flask A and in flask B? In each case give a reason for your answer.

(v) Mention one precaution that should be taken to ensure more accurate results.

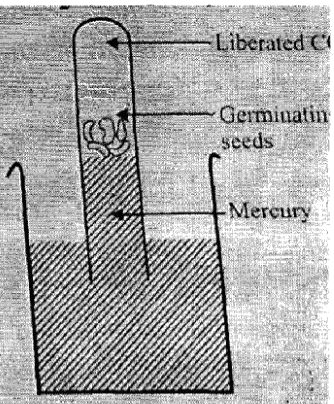
(vi) Give an overall balanced chemical equation to represent the process.

Q.10. The adjoining figure shows a certain experiment which was performed on germinating seeds:

(i) What does this experiment demonstrate?

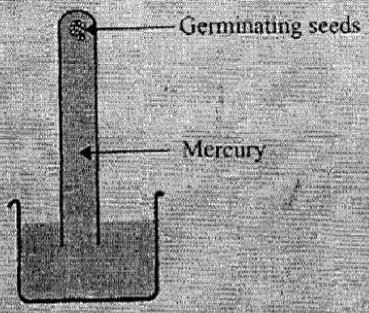
(ii) Redraw the figure as it would have been observed at the start of the experiment.

(iii) Write the chemical equation for the process stated in (i) above.



Ans. (i) Anaerobic respiration

(ii)



(iii) $C_6H_{12}O_6 \longrightarrow 2C_2H_5OH + 2CO_2 + \text{Energy (2 ATP)}.$

Brain Teasers

Q.1. Respiration occurs at optimum temperature. Give reason.

Ans. Respiration is a catabolic process which requires enzymes. At high temperature, the enzyme denatured and at very low temperature, they cannot function. So, optimum temperature is req

Q.2. One should not sleep under a tree at night. Why?

Ans. At night, droppings of the birds may fall on the person, under the tree, also insects, snakes, etc are a real threat.

Q.3. We use yeast for manufacturing wine. Give reason.

Ans. Yeast helps in the fermentation of glucose. Yeast respires anaerobically to produce ethyl alcohol and carbon dioxide.

Q.4. Farmers plough the field before planting crops.

Ans. Ploughing the field makes the soil airy and porous. When the soil is loosened, the roots of the plants can take O_2 present in the soil by diffusion.

39. Write differences between the following

(i) Fermentation and anaerobic respiration

(ii) Glycolysis and Krebs' cycle

Ans. (i) Differences between fermentation and anaerobic respiration are as follows

Fermentation	Anaerobic respiration
It takes place in microorganisms.	It takes place in higher plants and animal tissues without oxygen.
It is extracellular.	It is intracellular.

(ii) Differences between glycolysis and Krebs' cycle are as follows

Glycolysis	Krebs' cycle
It takes place in cytoplasm.	It takes place in mitochondria.
Pyruvic acid is produced during glycolysis.	Pyruvic acid is used in Krebs' cycle.

40. List different ways of gaseous exchange in plants.

Ans. Gaseous exchange in plants occurs through

(i) Stomata (in leaves)

(ii) Lenticels (in stem)

(iii) Root hairs

(iv) Pneumatophores (e.g. mangrove plants)

41. Give reasons.

(i) Respiration is reverse of photosynthesis.

(ii) It is not good to sleep under a tree at night.

Ans. (i) Photosynthesis produces glucose, whereas respiration breaks down glucose.

(ii) The tree produces lots of CO_2 as a result of respiration. CO_2 is toxic to health.

5 Marks Questions

42. Write five differences between combustion and respiration.

Ans. Refer to text on page no. 81.

43. Name the following :

(i) Chemical that enters the mitochondria for its further oxidation which is formed from pyruvic acid.

(ii) Respiratory substrate other than glucose.

(iii) The chemical generally used to absorb carbon dioxide in respiratory experiments.

(iv) A microorganism that produces lactic acid on fermentation.

(v) The respiration that takes place in the presence of oxygen.

Ans. (i) Acetyl Co-A

(ii) Fats

(iii) Potassium Hydroxide (KOH)

(iv) Bacteria

(v) Aerobic respiration

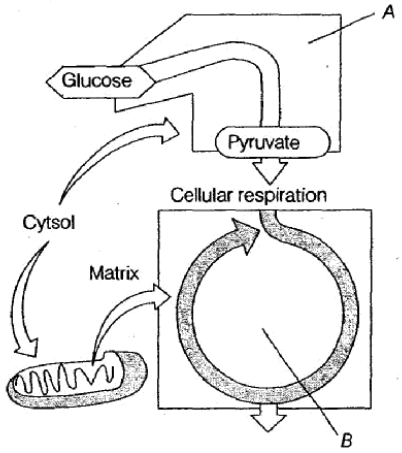
44. Plan an experiment to demonstrate that heat is produced during respiration.

Ans. Take two thermoflasks *A* and *B*. Keep some germinating seeds in *A* and dry seeds in *B*. Insert a thermometer in each flask. Close the mouth of the flasks with cork.

Note the initial temperature. After two days again note the temperature. There is a rise in temperature in flask *A* showing that germinating seeds respire and produce heat. While in flask *B* no change is observed there since the flask contains dry seeds.

Diagram Based Questions

45. Observe the given diagram and answer the following questions.



(i) Label the processes as shown by *A* and *B*.

(ii) Which is the site of process *B*?

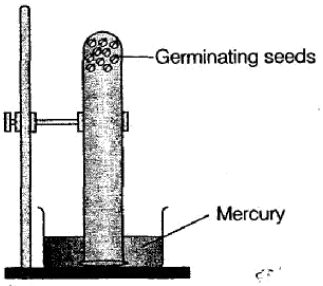
(iii) Which are the end products of process *B*?

Ans. (i) *A*–Glycolysis, *B*–Krebs' cycle

(ii) Mitochondria

(iii) Carbon dioxide and water

46. The figure given below shows an experiment performed on germinating seeds. Study the same and then answer the questions that follows

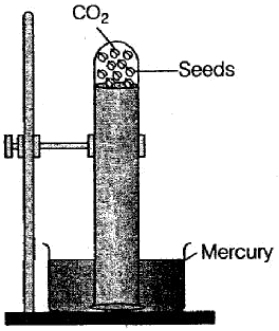


(i) What is the aim of the experiment?
(ii) Write the chemical equation for the process mentioned in (i) above
(iii) Draw a neat labelled diagram of the apparatus as it would appear after 24 hours.
(iv) The soaked seeds used in the experiment have their seed coats removed. Give reason for the same.

Ans. (i) The aim of the experiment is to demonstrate anaerobic respiration.

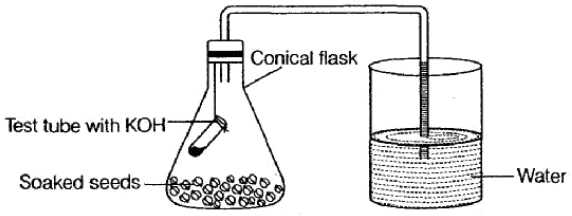
(ii) $C_6H_{12}O_6 \longrightarrow 2C_2H_5OH + 2CO_2$ + Energy

(iii)



(iv) The removal of seed coat helps in the easy diffusion of gases.

47. The given figure represents an experimental set up.



(i) What is the aim of the experiment?
(ii) Why has the water in the tube been risen?
(iii) What is the purpose of KOH?
(iv) Is there any control for this experiment? If so, mention it.
(v) What precaution should be taken for this experiment?

Ans. (i) The aim of the experiment is to show that respiration takes place in germinating seeds.

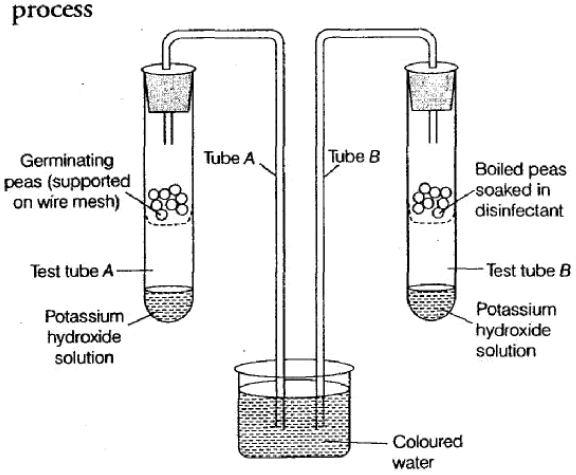
(ii) Seeds use oxygen for respiration which creates a vacuum in the tube and water level rises.

(iii) To absorb CO_2 released by the seeds.

(iv) Yes, take another conical flask with boiled seeds.

(v) The flask should be airtight.

48. The following diagram refers to an apparatus which is used to demonstrate a physiological process



(i) What is the purpose of keeping potassium hydroxide solution in test tubes *A* and *B*?
(ii) What is the purpose of keeping boiled peas soaked in a disinfectant in test tube *B*?
(iii) Why has coloured water risen in tube *A*?
(iv) Name the biological process which causes the above rise?
(v) Define the biological process shown in the experiment.

Ans. (i) To absorb CO_2 produced during respiration.

(ii) If these are not soaked in disinfectant, the bacterial growth may occur in the tube *B* and accurate result may not be obtained due to bacterial respiration.

(iii) The germinating peas respire and O_2 is used which creates a vacuum in the tube. So, coloured water rises in the tube *A*.

(iv) Respiration

(v) It is the stepwise oxidation of glucose in the living cells to release energy.

49. The apparatus given below demonstrates a particular process occurring in plants. Study the same and then answer the questions that follows.

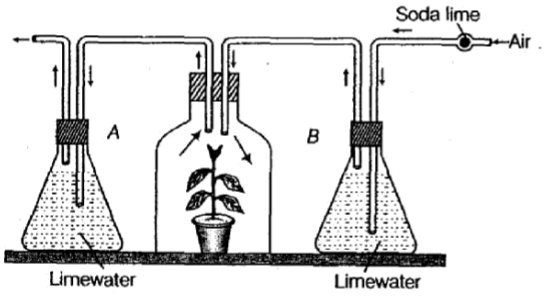
(i) Name the process involved in this set up.

(ii) Write the aim of the experiment.

(iii) Why is soda lime placed in the tube?

(iv) What change, if any, would you observe in the limewater in flask *A* and in flask *B*? Give a reason to support your answer.

(v) Write an overall balanced chemical equation to represent the process.



Ans. (i) The process of respiration is being demonstrated here.

(ii) The aim is to show that CO_2 is given out during respiration.

(iii) To absorb CO_2 from incoming air so as to make the air free from CO_2.

(iv) The limewater in flask *A* turns milky as the plant respires and gives out CO_2 which turns the limewater milky. The limewater in flask *B* remains clear as the incoming air is free of CO_2 by the soda lime.

(v) $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + 38ATP$

50. To study and prove a particular physiological process in plants, the following experiment was set up. Study the same and then answer the questions that follows.

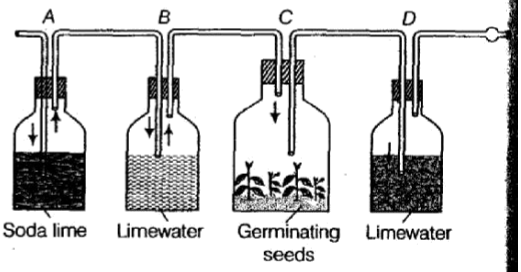
(i) Name the physiological process being studied.

(ii) What is the purpose of using soda lime in the bottle *A* and why is limewater placed in bottle *B*?

(iii) Would there be any change taking place in bottle *D*?

(iv) Represent the physiological process named in (i) above in the form of a chemical equation.

(v) If bottle *C* fitted with a 3 holed rubber stopper and a thermometer was introduced in such a way that its bulb reaches close to the germinating seeds, what would you observe. Why?



Ans. (i) Aerobic respiration.

(ii) To remove the carbon dioxide from the incoming air.
To insure that all the CO_2 present in the air has been absorbed/air entering the bottle *C* is free from CO_2.

(iii) Limewater turns milky.

(iv) $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + Energy$

(v) Mercury level would rise proving that heat is produced during respiration.

CHAPTER-8 (FIVE KINGDOM CLASSIFICATION)

Q 1. Why are scientific names of living beings considered better than their common names?

Ans. Common names are variable and are not enough to indicate as to which species the organism belongs ,hence they are confusing. In order to avoid confusion , scientific names are used.

Q 2. Mention any two drawbacks in classifying organisms under the old two kingdom classification.

Ans. a) Some organisms like Euglena have features of both plants and animals
b)Fungi which were placed under the plant kingdom lack chlorophyll

Q 3. All humans on earth today may differ widely in their facial features, colour, height, etc.Yet, they belong to a single species Homo sapiens.Give one reason why they are not considered belonging to different species?

Ans. All humans on earth today have the same number of chromosomes with the total number of genes remaining constant in them and can interbreed among themselves. So, they belong to the same species but they differ widely in characteristics due to the difference in the sequencing of genes on the chromosomes

Q 4. Name the five kingdoms according to the new classification

Ans. kingdom---Monera

Kingdom—Protista

Kingdom—Fungi

Kingdom---Plantae

Kingdom---Animalia

Q 5. Give any one difference between each of the following;

Ans. a) Protozoa and metazoan

Protozoa—unicellular organisms

Metazoa—multicellular organisms

h) Vertebrate and invertebrate Vertebrate—animals with a vertebral column or a backbone lnvertebrate---animals without a vertebral column or backbone

i) Insecta and Arachnida

Insect—animals (invertebrates) with three pairs of legs,usually with two pairs of wings Arachnida---animals (invertebrates) with four pairs of legs, wings absent

d) Flatworm and Roundworm

Flatworm—alimentary canal has one opening,coelom or body cavity absent Roundworm---

alimentary canal has two openings, pseudocoelom present

Q6. Explain the meaning of the terms cold-blooded and warm-blooded.

Ans. Cold-bloodedness/poikilothermal/ectothermal—The body temperature fluctuates with the

changes in the environmental temperature

Warm-bloodedness/homeothermal/endothermal—The body temperature remains constant

irrespective of the fluctuations in the environmental temperature

Q7. Mention any one major similarity and one major difference in the following pairs of animals
Ans. a) Insects and birds

Similarity—both have wings and can fly

Difference—insects are invertebrates where as birds are vertebrates

e) Whales and fishes
Similarity—both are aquatic

Difference-whales belong to class mammalia and breathe through lungs where as fishes belong to class pisces and breathe through gills

f) Snakes and earthworms

Similarity—both are limbless

Difference—snakes have a vertebral column where as earthworms lack it

f) Bat and pigeon
Similarity—both can fly

Difference—bats are viviparous where as pigeon is oviparous

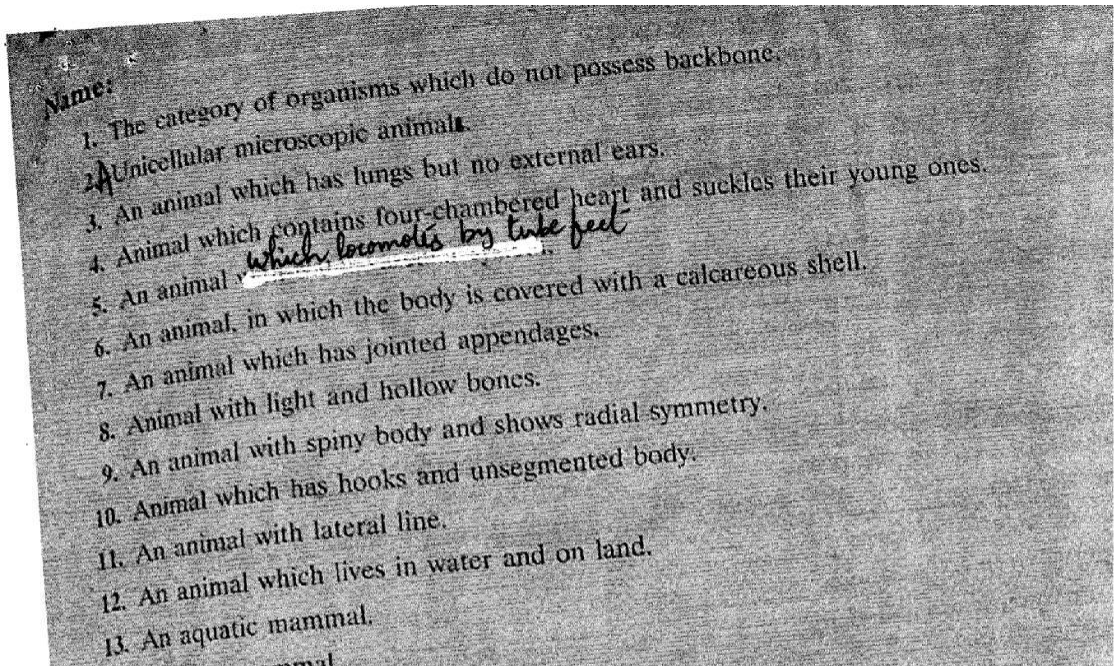
g) Cuttlefish and dogfish

Similarity—both are aquatic

Difference—cuttlefish is without a backbone where as a dogfish has f) Wall lizard and frog

Similarity—both have a vertebral column and are cold-blooded

Difference—wall lizard is completely terrestrial and has a three and a half chambered heart with a partially divided ventricle where as frog lives partly on land and partly in water and has a three chambered heart.


Name:

1. The category of organisms which do not possess backbone.
2. Unicellular microscopic animals.
3. An animal which has lungs but no external ears.
4. Animal which contains four-chambered heart and suckles their young ones.
5. An animal which locomotes by tube feet
6. An animal, in which the body is covered with a calcareous shell.
7. An animal which has jointed appendages.
8. Animal with light and hollow bones.
9. An animal with spiny body and shows radial symmetry.
10. Animal which has hooks and unsegmented body.
11. An animal with lateral line.
12. An animal which lives in water and on land.
13. An aquatic mammal.

Answers

1. Invertebrates
2. Amoeba
3. Snake
4. Mammals
5. Starfish
6. *Pila*
7. Cockroach
8. Bird like parrot
9. Starfish
10. Tapeworm
11. Fish
12. Frog
13. Whale
14. Bat
15. Butterfly
16. Fish
17. Robert H. Whittaker
18. Mushroom (*Rhizopus*)
19. Gymnosperm
20. Animalia
21. Protista
22. Bryophyta
23. Monocotyledons

Five Kingdom Classific

19. Gymnosperms

Name the phylum or class of the following:

1. Bat (class)
2. Rohu (class)
3. Sea horse (class)
4. *Pila*
5. Jelly fish
6. *Hydra*
7. Whale (class)
8. Sponge
9. Lizard (class)
10. *Ascaris*
11. Tapeworm
12. Leech
13. Starfish
14. Silver fish
15. Butterfly.

Answers

1. Class-Mammalia
2. Class-Pisces
3. Class-Pisces.
4. Phylum-Mollusca
5. Phylum-Cnidaria
6. Phylum-Coelenterata
7. Class-Mammalia
8. Phylum-Porifera
9. Class-Reptilia
10. Phylum-Aschelminthes
11. Phylum-Platyhelminthes
12. Phylum-Annelida
13. Phylum-Echinodermata
14. Phylum-Arthropoda
15. Phylum-Arthropoda

Complete the following table:

Main features	*Group*
1. Animals with exoskeleton	1. _____
2. Animals with slimy skins and scales	2. _____
3. Animals with rough scales	3. _____
4. Animals with feathers	4. _____
5. _____	5. Mammalia
6. _____	6. Mollusca
7. Animals with three pairs of legs	7. _____
8. _____	8. Fishes (Pisces)
9. Animals which are fixed.	9. _____
10. Diploblastic animals	10. _____

Ans.

A	*B*
1. Animals with exoskeleton	1. Arthropoda
2. Animals with slimy skins and scales	2. Pisces
3. Animals with rough scales	3. Reptilia
4. Animals with feathers	4. Aves
5. Have mammary glands and suckle their young ones	5. Mammalia
6. Animals with soft body and mantle	6. Mollusca
7. Animals with three pairs of legs	7. Arthropoda
8. Animals with streamlined body and have soft scales.	8. Fishes (Pisces)
9. Animals which are fixed.	9. Porifera
10. Diploblastic animals	10. Coelenterata

Write the similarity and difference of the following:

1. Bat and Parrot.
2. Snake and Lizard.
3. Shark and Whale.
4. Fish and Starfish.

Answers

1. Similarity – Both can fly.
   Difference – Bat is a mammal, parrot is a bird.
2. Similarity – Both crawl and have rough and dry scales.
   Difference – Snake do not have limbs, but lizards have.
3. Similarity – Both can swim.
   Difference – Shark breathe through gills while whale breathe through lungs.
4. Similarity – Both are aquatic.
   [redacted] have scales, starfish has spiny skin.

Distinguish Between the Following Pairs:

Q.1. Invertebrates and Vertebrates.

Ans.

Invertebrates	*Vertebrates*
(*i*) Backbone absent.	(*i*) Have backbone.
(*ii*) Heart dorsal in position.	(*ii*) Heart ventral in position.
(*iii*) Endoskeleton is absent.	(*iii*) Endoskeleton is present.
(*iv*) Nerve cord is dorsal.	(*iv*) Nerve cord is ventral.

Q.2. Protozoa and Metazoa.

Ans.

Protozoa	*Metazoa*
(*i*) They are unicellular.	(*i*) They are multicellular.
(*ii*) No tissue grade organisation.	(*ii*) Have tissue grade organisation.

Q.3. Cold-blooded and Warm-blooded animals.

Ans.

Cold-blooded animals	*Warm-blooded animals*
(*i*) Their body temperature changes according to the change in the external temperature.	(*i*) Their body temperature remains constant irrespective of the outside temperature.

Q.4. Snake and Lizard.

Ans.

Snake	*Lizard*
(*i*) They have no limbs.	(*i*) Have two pairs of limbs
(*ii*) Long and cylindrical body.	(*ii*) They have flat body.

Q.5. Bilateral and Radial symmetry.

Ans.

Bilateral symmetry	*Radial symmetry*
(*i*) Body can be divided into two equal halves by one plane only, *e.g.* man.	(*i*) Body can be divided into equal halves by any plane, *e.g.* starfish.

Q.17. Write the characteristic features of the following classes.

(*i*) Aves (*ii*) Reptilia (*iii*) Mammals

(*iv*) Amphibians (*v*) Pisces

Ans. (*i*) They are warm-blooded. Forelimbs are modified into wings.

(*ii*) They are cold-blooded. They have scaly non-glandular skin.

(*iii*) Possess mammary glands. They have external ears.

(*iv*) They are cold-blooded. They can live in water and on land as well.

(*v*) They are cold-blooded. They have fins for swimming.

Q.18. Bat can fly yet it is not a bird. Give reason.

Ans. Bat is a mammal. It is viviparous, it has mammary glands. It has external ears and the body is covered by hair, whereas birds are oviparous and their body is covered by feathers.

Q.19. What is the difference between snake and earthworm?

Ans. Snake is a vertebrate while earthworm is an invertebrate. Snake has rough scales on its body. Scale are absent on the body of earthworm.

57. Given below are the crude explanations of the words. Read the individual explanation and recognise the word corresponding to the given explanation.

(i) It is the lowest or the basic taxonomic category.
PSESCIE

(ii) Blue-green algae is included in this kingdom.
AEOMNR

(iii) A single large opening present in Porifera.
ULUOMSC

(iv) Another name for Platyhelminthes.
WSOFALRTM

(v) The group of organism having segmented worms.
EANIDANL

(vi) An animal possessing stinging cells.
AHYDR

(vii) The term used when coelom is absent.
OACAELMOTE

(viii) Kidney like structure in molluscs.
AEMTNEPIRHAID

(ix) Separate sexes.
ANSIUEUXL

(x) Excretory units in Annelida.
EPIRHAIDN.

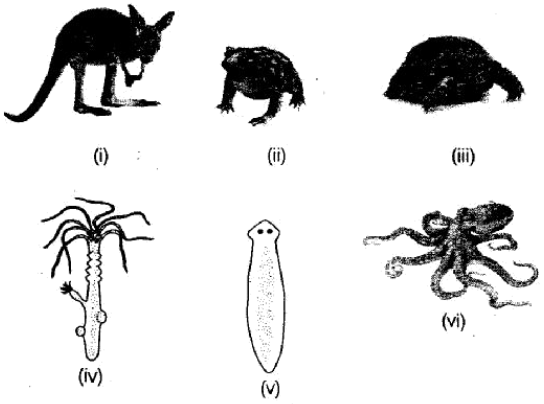
Ans. (i) SPECIES (ii) MONERA
(iii) OSCULUM (iv) FLATWORMS
(v) ANNELIDA (vi) *HYDRA*
(vii) ACOELOMATE (viii) METANEPHRIDIA
(ix) UNISEXUAL
(x) NEPHRIDIA

Diagram Based Questions

58. (i) Identify the plant.
(ii) To which group it belongs.
(iii) What is the main feature of it?

Ans. (i) *Agaricus.*
(ii) Kingdom–Fungi.
(iii) It is a heterotrophic plant.

59. Identify the following animals. In which phylum or class they belong? Write two features of each phylum or class.



Ans. (i) **Kangaroo**
- It is a mammal.
- They have mammary glands and heart four-chambered.

(ii) **Toad**
- It is an amphibian.
- It is cold-blooded.
- It can live in water and on land, as well.

(iii) **Turtle**
- It is a reptile.
- It is cold-blooded.
- Body has non-glandular scales.

(iv) ***Hydra***
- It is a coelenterate.
- It shows radial symmetry.
- It is diploblastic.

(v) ***Planaria***
- It is a platyhelminth.
- Body is bilaterally symmetrical.
- Body cavity is absent.

(vi) ***Octopus***
- It is a molluscan.
- Body is unsegmented and soft.
- Head is anterior.

CHAPTER-9

(ECONOMIC IMPORTANCE OF BACTERIA AND FUNGI)

Q 1. Would you consider bacteria and yeast as plants? Give reason.
Ans. Bacteria are non-chlorophyllous and prokaryotic ,hence cannot be placed under the plant kingdom.. .Likewise yeast is non-chlorophyllous, so cannot be considered as a plant

Q 2. In what form bacteria may be present in the air?
Ans. In the form of spores

Q 3. Why is spore formation in bacteria not considered a form of reproduction?
Ans. Spore formation in bacteria is not considered a form of reproduction because no new individuals are produced by this process.lt is a method to tide over unfavourable conditions.

Q 4. In what respect do you consider bacteria as simple organisms?
Ans. Bacteria are unicellular and prokaryotic,so are considered as simple organisms

Q 5. State the differences between
Ans. a) Decay and Putrefaction

Decay—complete breakdown of organic matter by bacteria without emitting foul smell
Putrefaction—incomplete breakdown of organic matter by bacteria emitting foul smell
b) Pasteurization and Sterilization
Pasteurization-It is a method of preserving milk by heating the milk at 60°C for 30 mins.and chilling it suddenly

Sterilization—It is a method to preserve food substances by heating them to a very high temperature.

Q 6. Why is it generally advised that every living room in the house should get direct sunlight at least for a short time?
Ans. The u-v rays of the sun help in disinfecting the rooms by killing the germs.

Q 7. Would there be any bacteria in an aquarium?
Ans. Yes,bacteria are found in an aquarium as it is an example of an artificial aquatic ecosystem and no ecosystem is complete without the decomposers like bacteria.

Q8. Describe the role of micro-organisms in industrial production
Ans. Role of bacteria in industry
a) Tanning of leather
b) Curing of tea and tobacco
c) Retting of fibres
d) Curing of cheese
e) Manufacture of vinegar
f) Manufacture of alcohol and acetone
g) Production of curd

Role of fungi
a) Production of wine

b) Production of bread and cakes
c) In flavouring cheese
d) Manufacture of organic acids such as lactic acid, citric acid, and oxalic acid

Q 9. What are antibiotics? Name any two examples

Ans. Antibiotics are chemical substances obtained from microorganisms to kill or inhibit the action of other harmful microorganisms. e.g. penicillin, streptomycin

Q 10. Is tinned and sealed food always safe to eat? Give reasons in support of your answer.

Ans. No,tinned and sealed food is not always safe to eat because it might harbour the bacterium, Clostridium botulinum which causes a severe kind of food poisoning known as botulism.

Q 11. Describe the role of certain fungi in industrial production

Ans. a) In bakeries,yeast is used for baking of bread

b) In breweries ,yeast and Aspergillus are used for alcohol production
c) Species of Penicillium and Aspergillus are used for flavouring cheese
d) In chemical industries,species of Mucor,Rhizopus,Penicillium are used for the manufacture of organic acids such as lactic acid, citric acid and oxalic acid

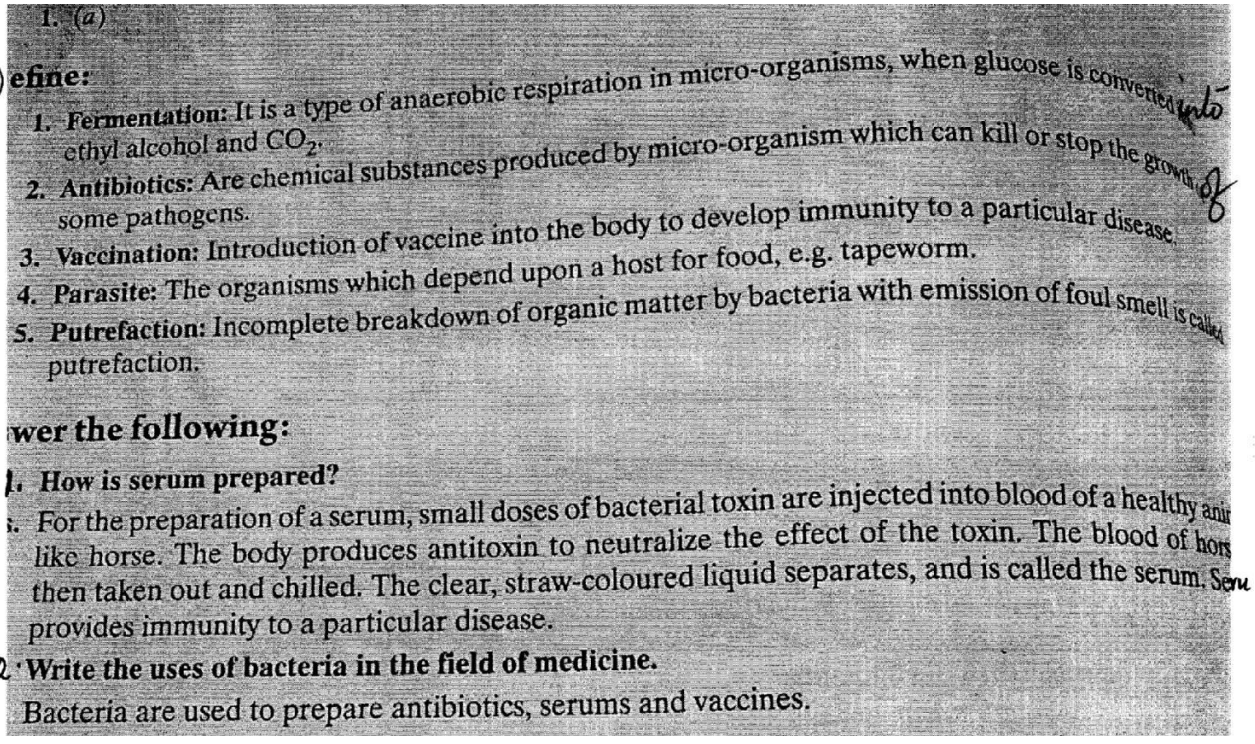
Q 12. Comment on the following:

a) Denitrifying bacteria are a blessing as well as a curse to farmers

Ans. Denitrifying bacteria is a blessing as it helps in maintaining the nitrogen cycle and it is a curse as well as it depletes the soil of nitrogen

b) Yeast is used in bakeries and breweries _____

Ans. In bakeries, yeast brings about the fermentation of dough which makes it rise, thus making the bread and cakes soft and fluffy. In breweries, yeast brings about fermentation of grapes, leading to the production of ethanol.



1. (a)

2 efine:

1. **Fermentation:** It is a type of anaerobic respiration in micro-organisms, when glucose is converted into ethyl alcohol and CO_2.
2. **Antibiotics:** Are chemical substances produced by micro-organism which can kill or stop the growth of some pathogens.
3. **Vaccination:** Introduction of vaccine into the body to develop immunity to a particular disease.
4. **Parasite:** The organisms which depend upon a host for food, e.g. tapeworm.
5. **Putrefaction:** Incomplete breakdown of organic matter by bacteria with emission of foul smell is called putrefaction.

wer the following:

1. **How is serum prepared?**

For the preparation of a serum, small doses of bacterial toxin are injected into blood of a healthy anir like horse. The body produces antitoxin to neutralize the effect of the toxin. The blood of hors then taken out and chilled. The clear, straw-coloured liquid separates, and is called the serum. Seru provides immunity to a particular disease.

2. **Write the uses of bacteria in the field of medicine.**

Bacteria are used to prepare antibiotics, serums and vaccines.

3. **State the harmful effects of bacteria.**

Harmful activities of bacteria:

(*i*) **Spoilage of food:** Some saprophytic bacteria spoil the food, e.g. rotting of vegetables, fruits, meat, cheese, butter, etc.

(*ii*) **Plant diseases:** Examples of plant diseases are:

(*a*) Blight of paddy by *Xanthomonas oryzae*.

(*b*) Crown gall of sugar beet by *Agrobacterium tumefaciens*.

(*c*) Wilt of tobacco by *Phytobacterium*.

(*d*) Citrus canker by *Xanthomonas citri*, etc.

(*iii*) **Animal diseases:** Common diseases caused by bacteria in man and animals include:

(*a*) Cholera – *Vibrio cholerae*

(*b*) Typhoid – *Salmonella typhi*

(*c*) Syphilis – *Treponema pallidum*

(*d*) Tetanus – *Clostridium tetani*

In animals:

(*a*) Anthrax by *Bacillus anthracis*.

(*b*) Mastitis by *Staphylococcus*.

Give reasons:

Q.1. What is the black powder we see on stale bread?

Ans. When a piece of bread is kept in a warm place, spores of moulds, like *Rhizopus* fall on it and germinates to form mycellium, which is seen as black powder.

Q.2. Why antibiotics are given to the patients suffering from bacterial disease?

Ans. Antibiotics are produced from some bacteria or fungi. They are more effective on bacterial diseases. The antibiotic can destroy the cell wall of bacteria and stop their multiplication or growth, thereby reducing infection.

Q.3. What is the importance of allowing direct sunlight to enter the living rooms in a house, may be for a short time?

Ans. Direct sunlight helps in killing microbes in the air and thus, keeps the environment of the room pleasant.

Q.4. 'Tinned or Canned food is safe to eat.' Is it correct? Give reason.

Ans. Tinned or canned food is generally safe to eat. But it may happen that some microbes may survive in it. So, its better to buy fresh food.

(iii) **Proteins and fats** Proteins are synthesised from yeasts, whereas, fats by *Penicillium* and *Aspergillus*.

(iv) **Hormones** Gibberellins are the plant hormones that are produced by the fungus, *Gibberella-fujikuroi*. It is used to accelerate growth of several horticultural crops.

46. Write one example of each

(i) Fungi that help in medicines

(ii) Fungi used as food

(iii) Fungi that cause plant disease

(iv) Fungi that cause diseases in humans

Ans. (i) *Penicillium notatum*

(ii) *Agaricus bisporus*

(iii) *Albugo candida*

(iv) *Trichophyton*

5 Marks Question

47. Explain the economic importance of bacteria in terms of their utility.

Ans. Bacteria are useful in the following ways

(i) Bacteria are natural scavengers. They obtain nutrition by decomposing dead bodies, dead plants and animal excreta.

(ii) These are used in fermentation for vinegar manufacturing, yogurt making, etc.

(iii) Some bacteria help in retting of jute and coconut plant fibres. The separated fibres are used in making ropes or gunny bags.

(iv) The genus–*Streptomyces* has many species used to produce different antibiotics.

Some important antibiotics manufactured using various bacteria are neomycin, chloromycetin, streptomycin, gramicidin, bacitracin.

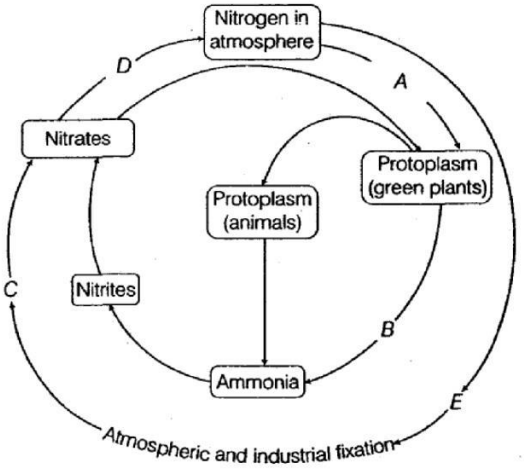
(v) Bacteria play an important role in nitrogen cycle. Some important bacteria in nitrogen cycle are *Clostridium, Azotobacter* (soil bacteria), *Rhizobium leguminosarum, Bacillus radicicola* (in nodules), *Nitrosomonas, Nitrosobacter, Pseudomonas,* etc.

Diagram Based Question

48. Observe the given figure carefully to answer the questions that follows

(i) Identify the process *A-E*.

(ii) Write the importance of this cycle.



Ans. (i) *A* – Nitrogen-fixation

B – Ammonification

C – Nitrification

D – Denitrification

E – Nitrification

(ii) This process allows continuous flow of nitrogen in air, soil and water. It is important as nitrogen is an essenti element for living organisms.

CHAPTER- 10 (NUTRITION)

Q1. Name the mineral nutrient that is needed for the following respectively
Ans. a) Proper teeth—calcium

j) Proper working of thyroid—iodine

k) Synthesis of haemoglobin—iron

Q2. Name the nutrients whose deficiencies cause the following diseases
Ans. a) Pernicious anaemia—cobalt (pernicious anaemia

g) Pellagra—niacin (vitamin-B3)
h) Night blindness—vitamin A

i) Goitre—iodine
j) Kwashiorkor—protein

Q3. Give two examples each of the following and their usefulness,if any,in our body.
Ans. a) Monosaccharides---glucose, fructose

Usefulness- oxidized directly to produce energy

Disaccharides—lactose,maltose

Usefulness- are broken down to monosaccharides with the help of enzymes and then oxidized to liberate energy

Polysacch andes—starch, glycogen,cellulose

Usefulness—starch---storage form of carbohydrate in plants Glycogen—storage form of carbohydrate in animals

Cellulose---a constituent of cell walls

Q4. List the six main purposes for which food is required by the body
Ans. a) for growth

h) For repair of worn out cells
i) For energy to carry out several life functions

j) For maintenance of chemical composition of cells
k) For protection from diseases and infection

l) serves as a provision of raw materials for the synthesis of enzymes, hormones

Q5. Why are proteins necessary in our food? Name one protein deficiency disease of young children.

Ans. Proteins are required for growth and repair of injured body cells. During emergencies, it provides us with energy. Kwashiorkor is a severe protein deficiency disease affecting young children.

SOLVED QUESTIONS

Name:

1. A mineral required for clotting of blood.
2. The structural unit of proteins.
3. A rich source of carbohydrates.
4. A water soluble vitamin.
5. A fat soluble vitamin.
6. A disease caused by the deficiency of iron.
7. A mineral present in bones and teeth.
8. Sunshine vitamin.
9. Deficiency disease of vitamin C and D.
10. An essential element of proteins.

Answers

1. Calcium
2. Amino acid
3. Potato
4. Vitamin-C
5. Vitamin-A
6. Anaemia
7. Calcium
8. Vitamin-D
9. Vitamin C Scurvy and Vitamin D Rickets
10. Nitrogen

Complete the following:

1. _____ is not digested in man.
2. _____ is required for transmission of impulses.
3. _____ is the animals starch.
4. _____ is an example of polysaccharides.
5. _____ vitamin is called anti-rachitic.
6. _____ is the simplest carbohydrate.
7. _____ is caused by vitamin B_{12} deficiency.
8. A rich source of protein is _____.
9. Protein deficiency in children leads to _____.
10. Night-blindness is caused by deficiency of _____.
11. Element present in thyroxine is _____.

Answers

1. Cellulose
2. Sodium
3. Glycogen
4. Starch
5. Vitamin D
6. Glucose
7. Pernicious anaemia
8. Egg
9. Kwashiorkor
10. Vitamin A
11. Iodine

State the uses of:

Q.1. Iodine

Ans. Iodine is an important component of thyroxine hormone. Thus, for the proper functioning of thyroid gland, iodine is required.

Q.2. Iron

Ans. For the synthesis of haemoglobin in blood.

Q.3. Vitamin C

Ans. Capillary wall's functioning is promoted.

Q.4. Carbohydrates

Ans. Carbohydrates provide energy.

Q.5. Water

Ans. Water is required for biochemical activities; transportation of substances, etc.

Q.6. Sodium

Ans. To maintain fluid balance for nerve and muscle.

Q.7. Phosphorous

Ans. For healthy bones and teeth, absorption of minerals in the body.

Write the disease caused due to the deficiency of the following:

1. Vitamin A
2. Vitamin B_1
3. Vitamin B_{12}
4. Vitamin D
5. Vitamin C
6. Vitamin K
7. Sodium
8. Iron
9. Iodine
10. Calcium.

Answers

1. Night-blindness
2. Beriberi
3. Pernicious anaemia
4. Rickets
5. Scurvy
6. Slow clotting of blood.
7. Muscular cramps
8. Anaemia
9. Goitre
10. Rickets

State whether the following are true or false:

1. A rich source of iodine is sea food.
2. Cellulose cannot be digested in human body.
3. Vegetables provide fats to the body.
4. B_{12} is a fat soluble vitamin.
5. Anaemia is caused by deficiency of calcium.

Answers

1. True
2. True
3. False
4. False
5. False

Complete the Table:

Vitamins/Minerals	*Source*	*Deficiency disease*
Calcium	Milk	(i)
(ii)	Citrus fruits	Scurvy
Calciferol	(iii)	(iv)
Riboflavin	Eggs	(v)

Answers

(*i*) Rickets
(*ii*) Vitamin C
(*iii*) Fish liver oil
(*iv*) Rickets (in children) and osteomalacia (in adults)
(*v*) Inflammation of the tongue.

Choose the correct option from the brackets and complete:

1. Vitamin A is known as _____ .
   (*a*) Retinol (*b*) Ascorbic acid (*c*) Folic acid (*d*) Calciferol
2. Kwashiorkor in children is due to deficiency of _____ .
   (*a*) Protein (*b*) Protein and carbohydrate
   (*c*) Vitamin (*d*) Minerals
3. An adult labourer need _____ kcal daily.
   (*a*) 1450 (*b*) 3500 (*c*) 2500 (*d*) 1100
4. Vitamin B_1 deficiency causes _____ disease.
   (*a*) Scurvy (*b*) Ricket (*c*) Beri-beri (*d*) Pellegra
5. _____ is a double sugar.
   (*a*) Glucose (*b*) Sucrose (*c*) Fructose (*d*) Cellulose

Answers

1. (*a*) 2. (*a*) 3. (*b*) 4. (*c*) 5. (*b*)

State the difference between:

Q.1. Disaccharides and Polysaccharides.

Ans.

Disaccharides	*Polysaccharides*
(*i*) Has two sugar molecules.	(*i*) Has more than two sugar molecules.
(*ii*) General formula is $C_{12}H_{22}O_{11}$.	(*ii*) General formula is $(C_6H_{10}O_5)_n$.
(*iii*) These are first digested and then absorbed in the body.	(*iii*) These are not digested.

Q.2. Carbohydrates and Proteins.

Ans.

Carbohydrates	*Proteins*
(*i*) The elements present are carbon, hydrogen and oxygen.	(*i*) They contain carbon, hydrogen, oxygen and nitrogen.
(*ii*) These provide energy.	(*ii*) These are required for growth and repair of the body tissues.
(*iii*) Sources are potato, cereals, etc.	(*iii*) Sources include meat, egg, soyabean, etc.

Q.3. Kwashiorkor and Marasmus.

Ans.

Kwashiorkor	*Marasmus*
(*i*) Affect children (1–5 years of age).	(*i*) Affect infants (below 1 year)
(*ii*) Darkening of the skin.	(*ii*) No darkening of the skin.
(*iii*) Caused due to deficiency of proteins.	(*iii*) Caused due to the deficiency of carbohydrate, fats and proteins.

Q.11. What is a balanced diet?

Ans. A diet which contains all the nutrients in required proportion with water and roughage.

Q.12. Define malnutrition.

Ans. A condition in which one or more nutrients are lacking from the diet.

Q.13. What is roughage? Give its importance.

Ans. Roughage is the undigested part of the food, contains plant fibres.

Roughage is used for movement of food (peristalsis) along the alimentary canal. It helps to remove toxic substances.

Q.14. What happens if roughage is not included in the diet?

Ans. If roughage is not included, it may lead to constipation.

Brain Teasers

Q.1. Fats are considered as the main energy producers. Why?

Ans. Fats consist of carbon, hydrogen and oxygen. Oxygen present is less than carbohydrate. So, the energy produced is more than carbohydrates. It produces approximately 9.4 kcal of energy.

Q.2. People living in hilly areas have swollen neck. Give reason.

Ans. One of the important elements in thyroxine is iodine. People living in hilly areas have less iodine in their diet. So, enlargement of thyroid gland is seen. This condition is called goitre.

Q.3. Cellulose is not digested in our body. Yet it is an important component of a balanced diet. Why?

Ans. Cellulose is the roughage in the food. The sources of it is vegetables, wheat, fruits, etc. Roughage helps to move the food along the wall of the intestine. Lack of it causes constipation. So, it must be included in the diet.

CHAPTER- 11 (DIGESTIVE SYSTEM)

Q 1. What is digestion? Why do only animals require a digestive system?

Ans. Digestion is the process of breaking down complex food substances into simple, diffusible form with the help of enzymes. Animals show holozoic mode of nutrition in which they take in complex food substances that has to be broken down into simpler form for assimilation.So, they require a digestive system.

Q 2. What are the end products of the digestion of starch,proteins and fats respectively?

Ans. Starch—glucose
Proteins---amino acids
Fats—fatty acids and glycerol

Q 3. Why is there no enzyme to digest vitamins?

Ans. Vitamins are absorbed directly from the digestive tract and transported by the blood to the cells.Hence, they do not require any enzyme for digestion.,Moreover,vitamins act as precursors to coenzymes,without which an enzyme will not function.

Q 4. How is thorough chewing of food helpful in digestion?

Ans. Thorough chewing of food breaks the larger food substances into smaller particles thus increasing the surface area for better action of enzymes.

Q 5. What is the rectum?

Ans. Rectum stores the undigested food temporarily.

Complete the following statements:

1. Complete digestion of food takes place in _____.
2. _____ are biocatalysis.
3. _____ helps in emulsifying fats.
4. The number of teeth in human are _____.
5. The end product of carbohydrate digestion is _____.
6. _____ teeth are well-developed in carnivorous animals.
7. The digestive juice secreted by pancreas is _____.
8. Pancreas is both _____ and _____ in function.
9. _____ helps in the curdling of milk.
10. Removal of undigested food is called _____.
11. _____ and _____ are the grinding teeth.
12. _____ is the part of the teeth above the gum.
13. The movement of food in the oesophagus is_____.
14. _____ , _____ and _____ are the salivary glands.
15. The inactive form of pepsin is _____.
16. In stomach food remains in the form of _____.
17. _____ , _____ and _____ are the parts of large intestine.

Answers

1. Small intestine	2. Enzymes	3. Bile
4. Thirty-two	5. glucose	6. Canine
7. pancreatic juice	8. exocrine and endocrine	9. Rennin
10. egestion	11. Molars and premolars	12. Crown
13. peristalsis	14. Parotid, submandibular and sublingual	
15. pepsinogen	16. chyme	17. Caecum, colon and rectum

State the functions of the following:

1. Incisor	2. Canine	3. Tongue	4. Pancreas
5. HCl	6. Oesophagus	7. Lacteal	8. Epiglottis
9. Tongue	10. Liver		

Answers

1. **Incisor:** For cutting and biting the food.
2. **Canine:** For tearing the food.
3. **Tongue:** For tasting the food, also rolls the food for proper mixing of saliva.
4. **Pancreas:** It produces digestive juice for digestion, and insulin a hormone.
5. **HCl:** It kills the bacteria that enter the stomach along with the food/activates propepsin or pepsinogen into pepsin.
6. **Oesophagus:** It passes the food into the stomach by peristaltic movements.
7. **Lacteal:** Lacteal is present in the intestinal villi, help to absorb fatty acids and glycerol
8. **Epiglottis:** It prevents the food to enter the trachea while swallowing.
9. **Tongue:** Mixes the food with saliva/to speak.
10. **Liver:** Deamination, synthesis of RBC in foetus, fat metabolism.

Define:

1. **Peristalsis:** The wave of contraction and relaxation in gut to push the food.
2. **Digestion:** The process of breaking down of complex food materials into simpler forms with the help of enzymes, so that it can be easily absorbed in the body.
3. **Enzymes:** Biological catalysts which alter the rate of a biochemical reaction without undergoing an change.
4. **Carnivore:** The animals which feed on the flesh of other animals.
5. **Assimilation:** It is the utilization of absorbed food for various purposes.

Write the role of the following enzymes:

1. Pepsin	2. Trypsin	3. Lipase
4. Rennin	5. Sucrase	6. Amylase
7. Lactase	8. Maltase	

Answers

1. Pepsin – Converts proteins into proteoses and peptones.
2. Trypsin – Hydrolyses proteins into peptones and polypeptides.
3. Lipase – Hydrolyses fats into fatty acids and glycerol.
4. Rennin – It converts milk protein caseinogen into insoluble casein.
5. Sucrase – Hydrolyses sucrose into monosaccharides.
6. Amylase – Hydrolyses starch into maltose.
7. Lactase – Hydrolyses lactose into glucose and galactose.
8. Maltase – Hydrolyses maltose into glucose.

1. False
4. *True*

Distinguish between the following pairs:

Q.1. Milk teeth and Permanent teeth.

Ans.

Milk teeth	*Permanent teeth*
(*i*) These are the temporary teeth, which fall off after a period of 7 or 8 years.	(*i*) These are permanent.
(*ii*) Its total number is 20.	(*ii*) These are 32 in number.

Q.2. Autotrophic and Heterotrophic nutrition.

Ans.

Autotrophic nutrition	*Heterotrophic nutrition*
— The mode of nutrition in which green plants synthesise their food.	— The mode of nutrition in which animals depend on plants for their food.

Q.3. Intracellular and Extracellular digestion.

ns.

Intracellular digestion	*Extracellular digestion*
— The digestion within the cell. For example: *Amoeba*.	— It takes place in an organ or cavity. For example: Man.

).4. Homodont and Heterodont.

ns.

Homodont	*Heterodont*
— *All the teeth are same, e.g. Snake.*	— The teeth varies in size, shape and function e.g. Man.

.5. Holozoic and Holophytic nutrition.

ts.

Holozoic nutrition	*Holophytic nutrition*
(*i*) Complex food is broken down into simple ones.	(*i*) Complex food is formed from simple one
(*ii*) It takes place in animals.	(*ii*) It occurs in green plants.

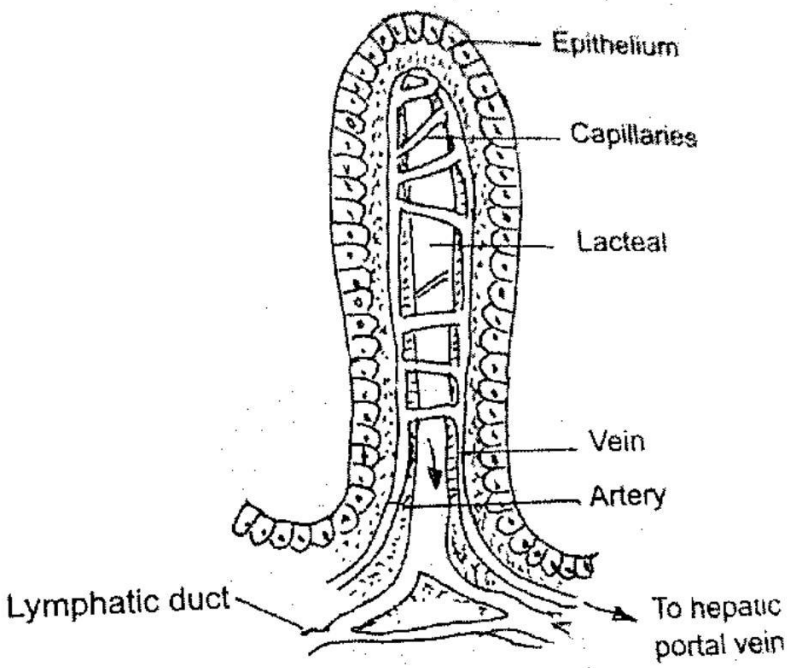
).6. Pepsin and Trypsin.

ns.

Pepsin	*Trypsin*
(*i*) Acts in acidic medium.	(*i*) Acts in alkaline medium.
(*ii*) Converts proteins into proteoses and peptones (polypeptides).	(*ii*) Converts ~~proteins into peptones~~ (pept and polypeptides. into peptides and amino acids.

In human, cellulose is not digested.

Draw the diagram of a villus.



Microscopic structure of an intestinal villus

Ans. (i) Goblet cells are located in the intestinal mucosal epithelium and secrete mucus.

(ii) Fats are broken down into di and monoglycerides with the help of lipases.

$$\text{Fats} \xrightarrow{\text{Lipases}} \text{Diglycerides} \longrightarrow \text{Monoglycerides}$$

(iii) Gastric glands of stomach mucosa have oxyntic cells which secret HCl.

(iv) Saliva contains enzymes that digest starch.

$$\text{Starch} \xrightarrow[\text{pH 6.8}]{\text{Salivary amylase}} \text{Maltose} + \text{Isomaltose} + \alpha - \text{dextrins}$$

5 Marks Questions

61. Deficiency of protein in diet of children causes serious disease. Name the disease and its symptoms.

Ans. Kwashiorkor is caused due to protein deficiency in children.

Proteins are important components of our food. Protein is a part of cell membrane and hence, is required for making new cells for growth and repair. All the enzymes are made from proteins and thus, proteins make different catalysts which are required for various metabolic functions. All the hormones are made from proteins.

Hormones are required for control and coordination in the body. Proteins are the major components of muscle fibres. They play an important role in blood clotting. Thus, it can be said that protein is an essential component of our food.

62. List the organs of human alimentary canal and name the major digestive glands with their location.

Ans. Human digestive system consists of two main parts, alimentary canal and digestive glands.

Alimentary canal comprises of following parts

(i) Mouth (ii) Pharynx

(iii) Oesophagus (iv) Stomach

(v) Small intestine (vi) Large intestine

(vii) Rectum (viii) Anus

Digestive glands includes

(i) **Salivary glands** are situated just outside the buccal cavity and secrete salivary juice into it.

(ii) **Liver** is the largest gland in the body, situated in the abdominal cavity just below the diaphragm and has two lobes. It secretes bile which helps in the digestion of fats.

(iii) **Pancreas** is the compound organ situated between the limbs of U-shaped duodenum acting as endocrine and exocrine organ. The exocrine portion secretes pancreatic juice whereas endocrine portion secretes hormones like insulin and glucagon.

63. Discuss the main steps in the digestion of proteins as the food passes through different parts of the alimentary canal.

Ans. **Digestion of Protein in Stomach**

The proenzyme pepsinogen on exposure to HCl, gets converted into active enzyme pepsin.

$$\text{Protein} \xrightarrow{\text{Pepsin}} \text{Proteases} + \text{Peptones}$$

Pepsin always acts in acidic medium (pH 1.8). In infants, milk proteins are digested by rennin.

Digestion of protein in small intestine

Pancreatic juice contains proenzyme, i.e. trypsinogen which gets activated by enterokinase, which is secreted by intestinal mucosa, into active trypsin. Trypsin acts in alkaline medium.

$$\text{Protein} \xrightarrow{\text{Trypsin / Chymotrypsin}} \text{Dipeptides}$$

The dipeptides get converted into amino acids by the enzyme succus entericus (intestinal juice).

$$\text{Dipeptides} \xrightarrow{\text{Dipeptidases}} \text{Amino acids}$$

Diagram Based Questions

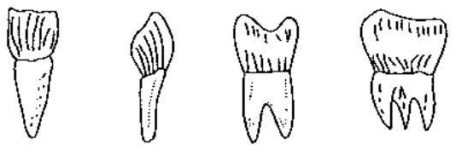
64. Study the figures given below and answer the questions that follows

The figures show different kinds of teeth in man.

(i) Name the teeth.

(ii) Write their functions.

(iii) Name two minerals present in teeth.

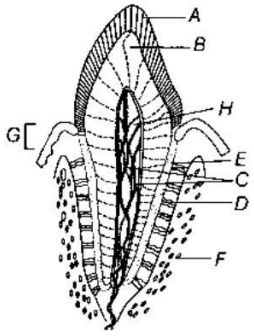


Ans. (i) Incisor, canine, premolar and molar

(ii) Incisor for biting, canine for tearing, premolar and molar for grinding.

(iii) Calcium and phosphorus

65. The figure shows the section of a mammalian tooth.



(i) Label the parts *A* to *H*.

(ii) Which is the hardest part of it?

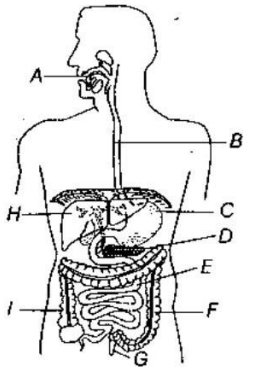
(iii) Which part of it is living?

Ans. (i) *A*–Enamel, *B*–Dentine, *C*–Blood capillaries, *D*–Gum, *E*–Cement, *F*–Jaw bone, *G*–Neck, *H*–Pulp cavity.

(ii) Enamel.

(iii) Pulp, containing blood capillaries.

66. The figure shows alimentary canal of man.



(i) Label the parts *A* to *I*.

(ii) What changes take place in parts *A* and *E*?

(iii) How does part *I* differ in man and rabbit?

Ans. (i) *A*–Mouth *B*–Oesophagus, *C*–Stomach *D*–Pancreas, *E*–Small intestine, *F*–Large intestine *G*–Anus, *H*–Liver, *I*–Caecum.

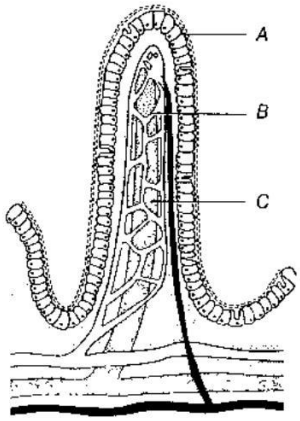
(ii) **A-Mouth** Starch is converted into maltose by ptyalin.

***E*-Small intestine** Complete digestion of food and absorption of digested food take place here.

(iii) **Part-*I* is caecum** In rabbit, it is longer than in human. In rabbit, the caecum contains some bacteria which produce some enzymes that digest cellulose.

In human, cellulose is not digested due to the absence of enzyme cellulase.

67. Observe the given figure and answer the following questions



(i) What does the figure represent?

(ii) Label the parts *A*-*C*.

(iii) Mention the role of structure shown in the figure

Ans. (i) Villi

(ii) *A*–Epithelium, *B*–Blood vessel, *C*–Lacteal

(iii) It helps in absorption of food (fat) in small intestine.

Annual Question Bank 2019-20

Std-9 Biology

Chapter 12. Movement And Locomotion

Q. 1. Mention the location of the following :

Parts of the skeleton	Location
Transverse process	Neural arches in vertebra
Glenoid cavity	Pectoral girdle
Shoulder-blade	Shoulder girdle
Acetabulum	Pelvic girdle

Q. 2. State two places where the cartilage provides support.
1. External Ear
2. Tip of the rose

Q. 3. Differentiate between true ribs and false ribs :

True rib	Floating rib
1. The first seven pairs of ribs are called true ribs.	1. The last two, i.e., 11^{th} and 12^{th} pairs of ribs are called floating ribs.
2. They are attached in front of the sternum by means of costal cartilages.	2. They are not attached to the sternum at all.

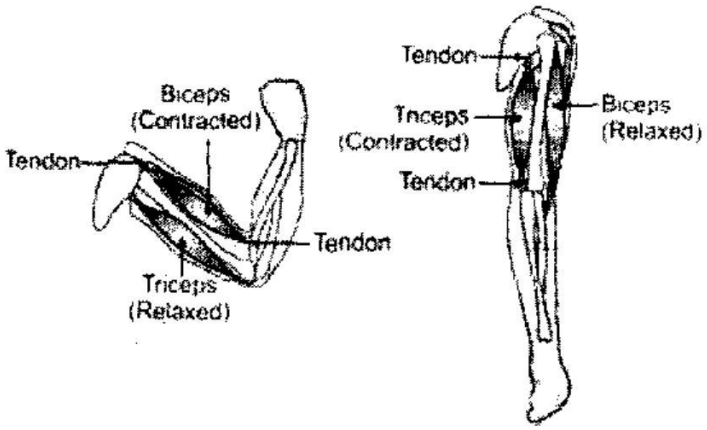
Q. 4. Name the corresponding bones of the hind limb :

Bones	Corresponding bones
Humerus	Thigh bone (Femur)
Tarsals	Carpals
Metacarpals	Metatarsals
Ulna	Fibula
Radius	Tibia

Q. 5. What are antagonistic muscles. Give an example.

Ans. Once a structure has been moved by a muscle, it cannot return to its original position without another muscle acting on it. Muscles that cause opposing movements are known as antagonistic muscles.

Example of antagonistic muscles:



Antagonistic muscles of the arm

When you flex your arm at the elbow, the muscle that lies above the upper arm, i.e. the biceps is seen and felt bulging. This muscle bulges due to contraction and becomes smaller in length, stiffer and thicker. Contraction of biceps draws the forearm towards the upper arm. However, relaxation of biceps cannot push the forearm back to its original position. When the arm is extended or straightened, the muscle at the back of the upper arm, i.e. the triceps contracts. The two muscles work antagonistically or in opposite directions to bend or flex and straighten the arm at the elbow.

Q. 6. What is meant by stiff joints? Explain

Ans. Some joints like shoulder joint, knee joint need to be held firmly in position to be well lubricated. Such joints contain a lubricating fluid called synovial fluid, which serves as a cushion between the bones and removes friction during movements. As we age, the joint movement becomes stiffer and less flexible because the amount of lubricating fluid inside the joints decreases and the cartilage becomes thinner. Ligaments also tend to shorten and lose some flexibility, making the joints feel stiff.

Q. 7. State two uses of the skeleton.

Ans. Uses of skeleton :

1. Support and shape: The skeletal system provides a framework to the body. It provides support to all soft parts and gives a definite shape to the body and all body parts.
2. Protection: The skeleton protects the internal delicate and important organs of the body. For example in human beings, the skull protects the brain, ribs protect the heart and lungs, vertebral column protects the spinal cord, etc.
3. Movement: The skeletal system helps in movement. It co-ordinates the movement of attached bones and muscles to bring about locomotion.
4. Leverage: Some bones and joints of the skeletal system form levers and help in magnifying, either the movement or the force. For example, slight contraction of biceps moves the hand to a distance of about a foot.
5. Formation of blood cells: The skeleton is the site of haematopoiesis. Various types of blood cells like red blood cells, white blood cells and platelets are formed in the bone marrow of some long bones.

6. Storehouse for minerals: The bones are a storehouse of calcium and phosphorus for the rest of the body.

Q. 8. State the different types of Joints. Give example of each.

Types of joints	Example
Immovable joint	Skull bones
Partially movable joint	Joints between vertebrae
Freely movable joint	Hip joint
Gliding joint	Ankle bones
Pivot joint	Joint between atlas and axis vertebrae
Hinge joint	Elbow
Ball and socket joint	Shoulder joint

Q. 9. Differentiate between tendon and ligament. (on the basis of structure & function)

Ligament	Tendon
Structure	
1. Ligament connects two or more bones together.	1. Tendon connects muscle to a bone.
2. They are elastic.	2. They are inelastic.
3. They are arranged freely.	3. They are arranged in bundles.
4. They are formed of yellow or elastic fibres.	4. They are formed of white or collagen fibres.
Function	
1. They help to stabilize joints.	1. They carry tensile forces from muscle to bone.
2. Prevent dislocation	2. Attach muscles to portions of the skeleton.

(i) Bone is a strong, hollow and non-flexible connective tissue.
(ii) It is hard, greyish-white tissue, composed of 2/3rd of inorganic substances or minerals like calcium, phosphorus, carbonates, etc. and 1/3rd of organic substances.
(iii) The outer surface of the bone is called periosteum. Periosteurn is a thin, dense membrane that consists of outer fibrous and inner cellular layer, nerves and blood vessels that nourish the bone.
(iv) The next layer is made up of compact bone. This part is highly calcified, very hard and rigid connective tissue. This tissue gives bones a smooth, white and solid appearance.
(v) The middle layer of bone consists of bone cells called osteocytes, which are arranged in the form of concentric rings. They are embedded in a hard matrix made up of collagen f1bre and mineral deposits.
(vi) The innermost hollow cavity of long bones contains bone marrow, which produces blood cells. Red bone marrow is present at the ends of the bone and produces majority of red blood

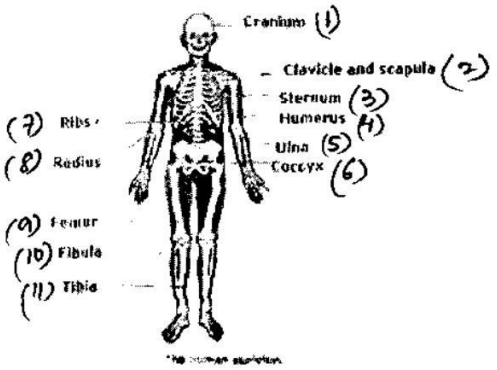
cells, platelets and most of the white blood cells. Yellow bone marrow contains higher amount of fat cells than red marrow and helps in the production some white blood cells.

Q. 10. Why are bones considered as living?.When are they considered as non living.?

Ans. (vii) Bones are living tissue as long as they are present in the living body. However, when they are taken out of the body, their cells die and the bones are then said to be dead.

Q D-5 Given below is a diagram of human skeleton. Name the bones numbered 1-11

Solution D.5.



1: Cranium/Skull; 2: Clavicle, Scapula; 3: Sternum; 4: Humerus:
5: Ulna; 6: Coccyx; 7: Ribs; 8: Radius; 9: Femur; 10: Fibula; 11: Tibia

EXTRA QUESTIONS

Q. Name the following:

1, The bones of arm.
2. The bones of pectoral girdle.
3, The regions of vertebral column.
4. The longest bone in human body.
5, The bone present in the upper arm.
6, The first vertebra of the vertebral column.
7. The cup-like cavity present in the Pelvic girdle.

Ans. 1- humerus, radius, ulna, carpals, metacarpals and phalanges 2- scapula and clavicle 3- cervical, thoracic, lumbar, sacral and coccygeal 4- femur 5- humerus 6- atlas 7- acetabulum

Q. State the functions:

Ans. 1. Pelvic girdle- articulation of femur
2. Thoracic cage- protection of heart and lungs
3. Synovial fluid- acts as a lubricant to absorb mechanical shock
4. Cranium- protection of brain
5. Glenoid cavity - articulates with the humerus

Q. Define the following :

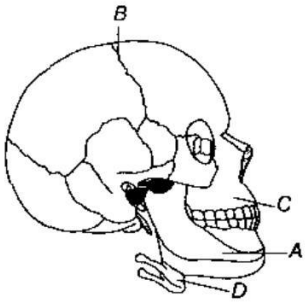
Ans. 1. Joint- the junction between two articulating bones,
2. Exoskeleton- The skeleton present on the body of an organism.
3. Appendicular skeleton- It is the part of endoskeleton which consists of bones of pectoral and pelvic girdles, arm and legs.
4. True ribs- The ribs which are directly connected to the sternum through the cartilage are called true ribs
5. Antagonistic muscles- It brings about opposite movement

Q. Write the location of the following :

Ans. 1. Pelvic girdle-it is located at the hip region articulates with femur
2. Gliding joint - it occurs between bones of wrist
3. Ligaments - it is located between two bones.

Diagram Based Questions

48. Identify *A, B, C* and *D* in the given diagram of human skull.

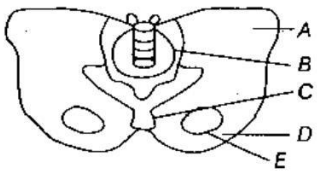


Also name the opening of skull through which spinal cord passes.

Ans. *A.* Mandible *B.* Sutures
C. Maxilla *D.* Hyoid bone

Foramen magnum is the large opening in the posterior portion of skull through which spinal cord passes.

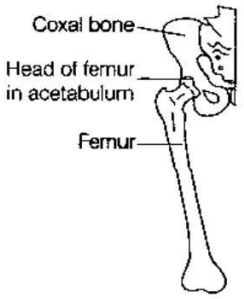
49. Identify *A* to *E* is the given diagram.



(i) Name the part where femur articulates.
(ii) Give one function of the part shown in the diagram.
(iii) Which joint is formed by two halves of pelvic girdle?

Ans. *A*-Ilium, *B*-Sacrum, *C*-Pubic symphysis, *D*-Ischium, *E*-Acetabulum.
(i) Acetabulum
(ii) It provides articulation to the bones of the leg.
(iii) Pubic symphysis.

50. Observe the diagram carefully and answer the questions that follow



(i) Which joint is shown in the figure?
(ii) Give another example of this joint.

Ans. (i) Ball and socket joint.
(ii) Shoulder joint (between pectoral girdle and head of humerus).

Chapter 13. Skin- "The Jack of All Trades"

Q. 1. Name the following:
a.Principal body heat regulating centre in our brain.
b.Modified sweat gland.
c.A modified sebaceous gland.

Ans. a) Hypothalamus, a portion of the forebrain is the principal body heat regulating centre in our brain.
b)Modified sweat gland: Mammary gland
c)Modified sebaceous gland: Ceruminous gland

Q. 2. Mention two functions of the skin.

Ans. Functions of the mammalian skin other than those concerned with heat regulation:
1. Storage of food: Skin acts as a storehouse of energy by storing reserve food in the form of fat in the hypodermis.
2. Synthesis of Vitamin D: Skin has the ability to synthesize small quantity of Vitamin D in the presence of sunlight.

Q. 3. What is meant by goose flesh ? How is it caused?

Ans. A peculiar roughness of the skin produced by cold or fear, in which the hair follicles become erect and form bumps on the skin is called goose flesh.
Goose flesh occurs when the muscles at the base of hair known as erectors or arrectors, contract. The erector muscles are obliquely placed between the hair follicle and the outer part of dermis. They are smooth muscles that are necessary to move the hair. The contraction of erector muscle pulls the hair vertical and depresses the epidermis, resulting in goose flesh.

Q. 4. Give reasons for the following :
a) Our teeth chatter and we shiver when we feel too cold.

Ans. Man is a warm-blooded mammal, Our body must maintain an average temperature of 98.6 degree Fahrenheit to function properly. When we feel too hot or too cold, our nervous system sends certain automatic and autonomic reflexes that help to keep us warm. In cold weather, the blood vessels get narrowed (vasoconstricted). Shivering occurs when our muscles expand and contract rapidly to produce extra body heat. The amount of heat produced is increased by increased metabolic rate and muscular activity, which occurs in the form of shivering. That is why, our body shivers and teeth chatter to protect from cold by generating more heat.

Q. 5. Differentiate between Leucoderma & Albinism.

Leucoderma	Albinism
Loss of skin pigmentation from smaller or larger patches at different regions of the body	Complete loss of pigmentation of the skin all over the body

Q. 6. Name two glands & mention their functions.

Ans. Two glands found in the human skin are:
1. Ceruminous gland: It is a modified sebaceous gland found in the auditory canal. It secretes wax-like substance called ear wax.

2. Mammary gland: It is a modified sweat gland. It is related to reproductive hormones and pregnancy.

Q. 7. Mention two conditions which can lead to perspiration even in cold weather.

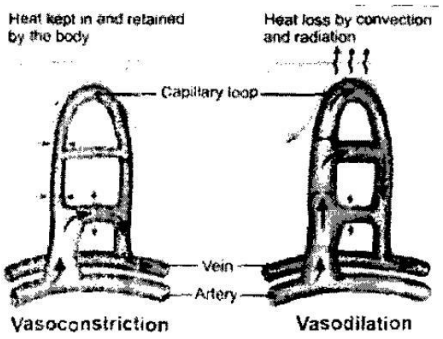
Ans. Fever and sickness or any kind of vigorous activity can lead to perspiration even in cold weather.

Q. 8. Explain the mechanism of vasodialation & vasoconstriction.

Ans. Vasodilation: Dilation of blood vessels in the skin leading to an increase in the blood supply.
Vasoconstriction: Narrowing of blood vessels leading to reduction in the blood supply to the skin.

Temperature regulation in cold weather:

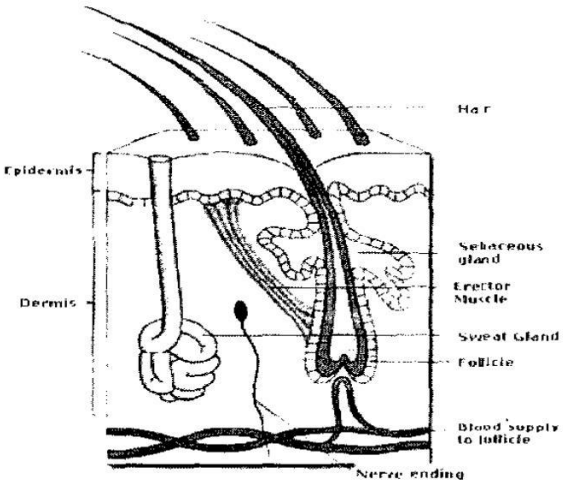
1. At low temperature, the blood vessels get narrowed or vasoconstricted. This reduces the blood supply to the skin.
2. There is less loss of heat by convection, conduction and radiation. There is less loss of heat through vaporisation as reduced blood supply lowers the secretion of sweat by sweat glands.



Temperature regulation in hot weather:

1. At high temperature, the blood supply to the skin is increased by vasodilation or dilation of blood vessels in the skin.
2. This results in greater loss of heat by convection, conduction and radiation. There is more loss of heat through vaporisation as more sweat is secreted due to rich supply of blood to the skin.

Q. 9. Draw a labeled diagram of a mammalian skin.



Q. 10. Mention the functions of the following
1. Sebaceous gland
2. Sweat gland
3. Fat
4. Hair

Ans. • Function of Sebaceous gland: It produces oil called sebum, which plays a role in keeping our skin moist.

Function of Fat: The skin reserves food in the form of a layer of fat.

• Function of Sweat gland: It secretes a transparent liquid (sweat) containing water and salts from the body in order to regulate body temperature.

• Function of Hair: Hair provide a sensation of touch and are also helpful in forensic investigations.

Partwhich has at least three functions:

Sebaceous gland:

1. Skin protection
2. Secretes an oily substance known as sebum that lubricates hair and skin of mammals
3. Presence of sebum enables to experience a wet skin even when we have not taken bath for days

(c) The one function which may be common to both men and women is that the fat serves as a food reserve and heat insulating layer as well as a shock absorber.

EXTRA QUESTIONS

Q. Name the following :
1. The muscles which contract and thus hair become erect
2, The layer of epidermis which divides repeatedly and give rise to new cells
3. The visible portion of hair
4. The tissue in the skin where the fat is stored
5. The process of dilation of blood vessels due to high temperature
6. The secretion of sebaceous gland
7. The dead protein present in the stratum corneum
8. Location of the heat-regulating centre of the body
9. The inflamed skin glands, which cause acne
10. Goose flesh is caused due to the contraction of
11. The subcutaneous tissue of man is rich in

Ans. 1- erector muscles 2- malpighian layer 3- shaft 4- adipose tissue 5- vasodilation 6- sebum 7- keratin 8- hypothalamus 9- sebaceous gland 10-erector muscles 11- fat

Q. State the location and function of the following:

s.no	Structure	Location	Function
	Malpighian layer	It is located between granular layer and dermis	Its cells divide to produce new cells to replace the worn out cells
2	Sweat glands	They are located in the dermis	They help in sweating thereby control temperature
3	Sebaceous glands	They are located in the dermis	To secrete sebum that

			makes the skin oily
4	Subcutaneous fat layer	It is located below dermis	To store fat and act heat-insulating layer
5	Hair	They are located in the skin	These are sensory and warm the body

Q. State the difference between the following :

Leucoderma	Albinism
It is a condition in which the skin pigment is lost in patches	It is the complete loss of skin pigmentation
The cause is not yet known	It is an inherited disease
Sweat glands	Sebaceous gland
These are duct glands	These are ductless gland
These secrete sweat	These secrete sebum
Sweat	Sebum
It is a secretion of sweat gland	It is a secretion of sebaceous gland
It keeps the body cool	It makes the skin soft and waterproof
It is a watery fluid	It is an oily secretion
Vasodilation	Vasoconstriction
More blood flows through the dilated blood vessels	Less blood flows through the constricted blood vessels
It increases heat loss	It decreases heat loss
It decreases the body temperature	It increases the body temperature

Q. **G**ive reasons:

1. The skin of palm is thick and rough.

Ans. Thick and rough skin provides more grip

2. Europeans are light coloured.

Ans. Skin colour is due to melanin pigment located in the malpighian layer. If the secretion of this pigment is less, the skin becomes light coloured.

Chapter 14. The Respiratory System

Exercise 1

Solution A. 1.
1. (b) contracts
2. (a) &veoli
3. (b) loss in dry weight

Solution B. 1.
(a) Diaphragm
(b) Starch
(c) Diffusion
(d) Diffusion
(e) Hypoxia
(f) Vocal cord

Solution B. 2
(a) Epiglotis
(b) Capillaries
(c) Diaphragm
(d) Haemoglobin
(e) Ribs/Pleura
(f) Alveoli or air sacs

Solution B. 3

COMPONENT	INSPIRED AIR	EXPIRED AIR
1. Oxygen	20.96%	16.40%
2. Carbon dioxide	0.04%	4.00%
3. Nitrogen	79.00%	79.60%

Solution B. 4
ATP or Adenosine Triphosphate is termed as "Currency of Energy" of the cell.

Solution B. 5

Column I	Column II
(a) Alveoli	(iii) diffusion of gases
(b) Bronchioles	(iv) small air tubes
(c) Nasal Chamber	(ii) lined with hair
(d) Bronchi	(v) an inverted Y shaped tube

Solution C. 1
(a) AlveoIi and gaseous diffusion
(b) Mitochondria and power house (respiration)
(c) epiglottis and guards entrance of trachea
(d) Pleura and protection of lungs

(e) Diaphragm and differentiates thoracic cavity and abdominal cavity
(f) C shaped cartilage rings and helps trachea to distend and provide flexibility

Solution C. 2
(a) Ciliated epithelium: It is the protective inner lining of the respiratory passage. It helps in motion, driving any fluid that is on them.
(b) Mitochondria: In mitochondria, pyruvic acid is further broken down step by step in a cyclic manner in the presence of oxygen.(cellular respiration)
(c) Diaphragm: Diaphragm contributes to the enlargement of the chest cavity lengthwise.
(d) Intercostal muscles: The muscles help the inward and outward movement of ribs enlarging the chest cavity all around.
(e) Pleural fluid: It provides lubrication for free movement of the expanding and contracting lungs.

Solution C. 3

Column A	Column B
Cartilaginous	Bronchi
Large surface area	Alveoli
Breathing movements	Diaphragm
Voice	Larynx
Complemental air	Extra inhalation
Swallowing	Epiglottis

Solution C. 4
Strenuous exercise as concentration of CO2 increases.

Solution C. 5
During breathing, the air expelled out is always warmer or at body temperature. It can be felt by breathing out the air on our own hand. One can feel the warmth of the air expelled out during breathing.

Solution C. 6
The nasal cavity is lined by ciliated epithelium and mucous glands. The mucous glands secrete mucous. The ciliated epithelium is present on the entire lining of larynx, trachea, bronchi and bronchioles. The constant motion of cilia and mucous trap dust, microorganisms, pollen and other minute particles present in the air. In this way, the respiratory passage is kept free of dust particles.

Solution C. 7
We inhale air which contains more of oxygen and less of carbon dioxide. We exhale air which contains more of carbon dioxide and less of oxygen. Therefore, the statement "We breathe in oxygen and breathe out carbon dioxide" is wrong.

Solution D. 1
(a) Aerobic respiration CO2, H2O, ATP, Heat energy
Anaerobic respiration Lactic acid, ATP, Heat energy
(b) Respiration : CO2
Photosynthesis : O2
(c) Photosynthesis : CO2 + sunlight + H2O

Respiration : Glucose (with or without oxygen)

(d) Inspired air : 0.04%
Alveolar air : 5.2%

(e) Respiration : Lungs, bronchi, alveoli
Breathing: nasal cavity, trachea, diaphragm

(f) Tidal volume : 500ml.
Residual volume : 1500ml.

Solution D. 2

(a) Breathing through the nose is said to be healthier than through the mouth because the hair present in the nostrils prevent large dust particles from entering inside the respiratory system.
(b)Gaseous exchange continues in the lungs even after expiration because air still remains in the alveoli called residual volume c) At higher altitudes, the oxygen content of the air is low. So, a person feels breathlessness.

Solution D. 3.

(ii) The diaphragm flattens and presses the organs inside the abdomen. When the abdominal muscles relax, the abdominal wall moves outwards.

(c) The overall chemical equation for the process of respiration in humans:

$$C_6H_{12}O_6 + 6O_2 \xrightarrow{\text{Enzymes}} 6CO_2 + 6H_2O + 38ATP + 420\ kcal$$

(d) 1. Residual air: Some air is always left in the lungs even after forcibly breathing out. This is the left over or residual air. This volume is 1500 ml.
2. Dead air space: Some tidal air is left in the respiratory passages such as trachea and bronchi, where no diffusion of gases can occur. This volume is called dead air space. It is 150 ml.

Solution D. 4

Path taken by the inspired air:
Nose — Pharynx — Larynx — Trachea —. Bronchi — Bronchioles — Alveoli

Solution D. 5

(a) Ribs: The ribs move inwards and outwards by the muscles stretched between them, thus enlarging the chest cavity all around.
(b) Diaphragm: On contraction, the diaphragm falls or flattens from the dome-shaped outline to an almost horizontal plane and thus, contributes to the enlargement of the chest cavity lengthwise.
(c) Abdominal muscles: Abdominal muscles help to increase the size of the thoracic cavity by the movement of diaphragm and therefore, aids in inspiration.

Solution E. 1

(i) 1: Thin walls of capillary; 2: RBCs (Red blood corpuscles)
3: Plasma; 4: Thin wall of the alveolus
(ii) 5: CO2 diffuses out; 6: O2 diffuses in

Solution E. 2

(a) Anaerobic respiration
(b) This reaction is applicable to animals only.
(c)This reaction may occur in muscular tissues (skeletal muscles).

Solution E. 3
(a) (i) Anaerobic respiration in plants: 5
(ii) End products in aerobic respiration: 4
(iii) Reaction occurring in liver: 3
(iv) Anaerobic respiration in animals: 1
(v) Storage in the liver: 3
(b) (i) Aerobic respiration: 4
(ii) Change taking place in the liver: 3
(iii) Anaerobic respiration in yeast: 5
(iv) Change taking place in a plant storage organ, e.g., potato: 2
(v) Anaerobic respiration in animals: 1

Solution E. 4
(a) **TidaI volume (TV):** Air breathed in and out, in a normal quiet breathing is called tidal volume. It is 500 mL.
(b) **Inspiratory reserve volume (IRV):** Air that can be drawn in forcibly over and above the tidal air is called inspiratory reserve volume. It is also known as complemental air. It is 3000 ml.
(c) **Expiratory reserve volume (ERV):** Air that can be forcibly expelled out after a normal expiration is called expiratory reserve volume. It is also called supplemental air. It is 1000 ml.
(d) **Vital capacity (VC):** Volume of air that can be taken in and expelled out by maximum inspiration and expiration is called vital capacity, It is 4500 ml.
(e) **Residual volume (RV):** Air left in the lungs, even after forcible expiration is called residual volume. It is 1500 ml.

Q. 5. Give reasons for the air that is breathed out is warmer.
During breathing, the air expelled out is always warmer or at body temperature. It can be felt by breathing out the air on our own hand. One can feel the warmth of the air expelled out during breathing.

Q. 6. Explain how the respiratory passage is kept dust free?
The nasal cavity is lined by ciliated epithelium and mucous glands. The mucous gtands secrete mucous, The ciliated epithelium is present on the entire lining of larynx, trachea, bronchi and bronchioles. The constant motion of cilia and mucous trap dust, micro-organisms, pollen and other minute particles present in the air. In this way, the respiratory passage is kept free of dust particles.

Q. 7. Define (a) Residual air (b) Dead air space

Ans. 1. Residual air: Some air is always left in the lungs even after forcibly breathing out. This is the left over or residual air, This volume is 1500 mL.

2. Dead air space: Some tidal air is left in the respiratory passages such as trachea and bronchi, where no diffusion of gases can occur. This volume is called dead air space. It is 150 mL.

Q.8. What happens to the ribs diaphragm ,& the abdominal muscles during inspiration

Ans. (a) **Ribs:** The ribs move inwards and outwards by the muscles stretched between them, thus enlarging the chest cavity all around.

(b) **Diaphragm:** On contraction, the diaphragm falls or flattens from the dome-shaped outline to an almost horizontal plane and thus, contributes to the enlargement of the chest cavity lengthwise.

(c) **Abdominal muscles:** Abdominal muscles help to increase the size of the thoracic cavity by the movement of diaphragm and therefore, aids in inspiration,

Q.9. Define the following:

Ans. 1. Respiration-It is biochemical reaction in which glucose is oxidized by stepwise reactions with the help of enzymes.

2. Tidal volume- It is the volume of air inspired or expired during normal breathing.

3. Inspiration- It is the inhalation of oxygen into the lungs.

4. Asphyxia- The condition in which oxygen supply to the respiratory system is cut off.

5. Ventilation of lungs- The breathing of air in and out of the lungs is called ventilation of lungs

Q.10. State the role of the following:

Ans. 1. Epiglottis- It closes the glottis during swallowing of food.

2. Diaphragm- The contraction and relaxation of diaphragm increases and decreases the volume of thoracic cavity during breathing.

3. cartilaginous rings of trachea-It prevents the collapsing of trachea.

4. Mucus membrane inside the nasal passage- To make the air moist and traps the dust particles and micro-organisms.

5. Larynx- To produce sound

6. Pleura- to protect the lungs

7. pleura fluid- lo lubricate the lungs for its easy movements

8. Inter-costal muscle- The relaxation of inter-costal muscles move the ribs inward and downward which decreases the volume of thoracic cavity.

9. Alveoli- To increase the surface area for exchange of gases,

Q.11. Explain the reason:

1. It is difficult to breathe at high altitude.

Ans. At high altitude, the concentration of oxygen is reduced which is not sufficient for normal breathing movements.

2. The glottis is guarded by epiglottis.

Ans. The glottis is guarded by epiglottis to prevent the entry of food into the trachea during swallowing.

3. The alveoli are covered with blood capillaries.

Ans. Alveoli are covered with blood capillaries for the easy diffusion of respiratory gases, since both alveoli and blood capillaries are thin-walled.

4. The wall of trachea is supported by C shaped cartilaginous rings.

Ans. To prevent the colapsing of trachea, the trachea is supported by cartilaginous rings.

5. Breathing rate increases after a vigorous physical exercise.

Ans. During vigorous physical exercise, the person needs more energy. So, rate of breathing increases during vigorous physical exercise.

Q12.. State the difference between;

1. Inspiration and expiration

Inspiration	Expiration
It is an active process	*It is a passive process*
It is the taking in of oxygen	It is the expelling of carbon dioxide
It increases the volume of thoracic cavity	It decreases the volume of thoracic cavity

2. Respiration in plants and animals

Respiration in plants	Respiration in animals
Plants do not have respiratory system	Have a respiratory system
Direct diffusion of respiratory gases in and out of the cells	The respiratory gases are transported upto the tissue cells

3. Pleural fluid and pericardial fluid

Pleural fluid	Pericardial fluid
The fluid formed in the pleural sac surrounding the lungs	The fluid formed in the pericardial sac surrounding the heart.

Transport of oxygen and carbon dioxide in detail is discussed below

Transport of oxygen done as

(i) Dissolved gas About 3% of oxygen in the blood is carried in a dissolved state through the plasma.

(ii) Oxyhaemoglobin About 97% of O_2 is carried by RBCs in the blood.

Transport of carbon dioxide CO_2 in gaseous form diffuses out of the cells into capillaries, where it is transported in following ways

(i) **Transport in dissolved** form About 7% CO_2 is carried in dissolved form through the plasma because of its high solubility.

(ii) **Transport as bicarbonate** The largest fraction (about 70%) is carried in plasma as bicarbonate ions (HCO_3^-).

At the tissues site, where pCO_2 is high due to catabolism. CO_2 diffuses into the blood (RBCs and plasma) and forms HCO_3^- and H^+.

(iii) **Transport as carbaminohaemoglobin** Nearly 20-25% CO_2 is carried by haemoglobin as carbaminohaemoglobin.

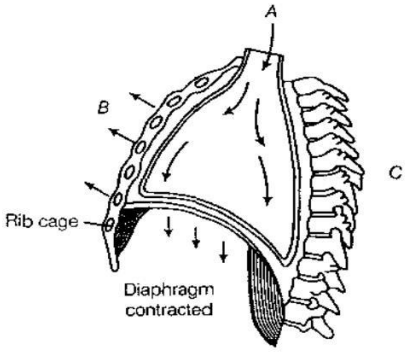
51. Differentiate between breathing and respiration.

ns. Differences between breathing (ventilation) and respiration are as follows

Breathing (Ventilation)	Respiration
It is a preliminary step for respiration and is a physical process. It involves inspiration of fresh air and expiration of foul air.	It is a biochemical process involving exchange of gases and oxidation of food.
No energy is released	It releases energy that is stored in the form of ATP.
It is an extracellular process.	It is an intracellular process.
It does not involve enzyme action.	It involves a number of enzymes in oxidation.
Breathing mechanism varies in different animals.	Respiratory mechanism is similar in all animals.
It is confined to certain organs only.	It occurs in all cells (mitochondria) of the body.

Diagram Based Questions

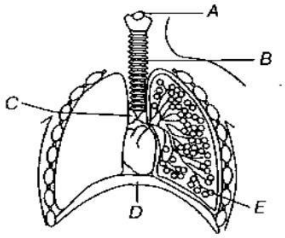
62. In the given diagram, identify what is depicted by *A*, *B* and *C*.



or Which process is shown here?
Is it an active or passive process?

Ans. *A* – Air entering lungs, *B* – Ribs and sternum raised, *C* – Volume of thorax increased.
The process shown in inspiration. It is an active process.

63. Identify *A*, *B*, *C*, *D* and *E* in the given diagram of human respiratory system.



Also, give the passage of air from nostrils to secondary bronchi.

Ans. *A* – Epiglottis, *B* – Trachea, *C* – Bronchus, *D* – Diaphragam, *E* – Bronchiole

Passage of air

Nostrils → Nasal chamber → Internal nares → Nasopharynx → Oropharynx → Larynx → Trachea → Primary bronchi → Secondary bronchi.

Chapter 15. Hygiene — A Key To Healthy Life

Exercise 1

Solution A.

1. (d) cholera
2. (d) Sharing towels with others
3. (d) Plasmodium
4. (c) Fluorides
5. (b) Bacteria

Solution B. 1

Column I	Column II
(a) Eggs	(iii) White cylindrical
(b) Adult	(i) Sucking proboscis
(c) Pupa	(ii) Barrel-shaped
(d) Larva	(iv) Legless

Solution B. 2

The different ways by which the housefly contaminates our food:

1. **Hairy body and legs:** Hairy or spiny body and legs easily pick up dirt containing germs from unhygienic places such as rotten materials, infected wound or faecal matter, When these flies sit on our food, they rub their legs continuously dropping the particles of dirt onto the food, thereby contaminating it.
2. **Pouring out saliva:** When the housefly pours its saliva or regurgitates on food, foodstuffs get moistened and pathogens get deposited on them. This results in their contamination.
3. **Excreta:** While feeding on food items, houseflies may deposit their excreta on food, contaminating it.
4. Direct transmission of germs: In some cases, houseflies directly transmit the pathogens. In case of eye disease trachoma, pathogens are transferred from an infected person to a healthy person, when a fly settled on an infected eye of a person sits on the eyes of a healthy person.

Solution B. 3

Two methods of controlling flies:

. Spraying of insecticides
. Elimination of breeding grounds

Solution B. 4

Effective methods for controlling mosquitoes:

. Spraying insecticides
. Food should be protected by covering it
. Eliminating breeding places of mosquitoes

Solution C. 1

Kind of mosquito	Disease caused by it
Anopheles	Malaria
Culex	Filariasis

Q. Complete the following :

1. Anopheles (female) mosquito spreads
2. Culex mosquito spreads
3. Entamoeba histolytica causes _____
4. Elephantiasis is caused by _____
5. Always breathe through _____
6. — and — are the diseases of eyes caused by pathogens.
7._____ is the carrier of pathogens.
8._____ pairs of legs are present in housefly.
9. Housefly is an _____-
10. Yellow fever is caused by_____

Ans. 1. - malaria, 2. - filariasis, 3. - amoebic dysentery, 4. - Wuchereria bancrofti, 5. - nose 6. - conjunctivitis, trachoma, 7. - vector, 8. - three, 9. - omnivore, 10. - Aedes mosquito

Q. Match the following:

Column A	Column B
Elephantiasis	Aedes
Cholera	Eye
Trachoma	Rat
Plague	Wuchereria
Dengue	Vibrio cholera

Ans.

Column A	Column B
Elephantiasis	Wuchereria
Cholera	Vibrio cholera
Trachoma	Eye
Plague	Rat
Dengue	Aedes

Q. State the difference:

Ans. 1. Culex and Anopheles mosquito.

Culex mosquito	Anopheles mosquito
Sits parallel while resting	Sits obliquely while resting
Wings are unspotted	Wings have dark spots
Eggs are laid in rafts and erect	Eggs are laid singly and horizontally

2. Mosquito and housefly.

Mosquito	Housefly
Has sucking and piercing mouth parts	Has sucking mouth parts
Has narrow wings	Has broad wings
Long and slender abdomen	Short and oval abdomen

Q. Give suitable explanations for the following :

Ans. (ii) We handle a variety of things like books, coins, furniture, tools and machinery in workshops, seats and supporting rods in buses and even pets and other domestic animals in our day-to-day life. Many of these objects carry germs. These germs can be picked up by us, when we touch these objects and get transferred to other parts of our body or into our mouth, when we eat our food. Therefore, it is necessary to wash our hands before eating food to avoid the spread of diseases caused due to these germs.

(iii) Flies are carriers of many disease-causing germs and bacteria. Therefore, eating places must be kept free of flies to avoid possible contamination of food.

Solution D. 2

Cockroaches and rats are common household pests.

1. Cockroaches are involved in spoiling food, paper and cloth. They may act as carriers of viruses, especially those which cause cancer.
2. Rats eat grains and other foods. They also act as carriers of certain pathogens. A parasite named rat-flea lives on rat's skin. It possibly carries the germs of plague.

Solution D. 3

TYPE OF DYSENTERY	CAUSATIVE GERM	PRECAUTION
1. Bacillary dysentery	Bacterium: *Shigelladysenteriae*	Drinking safe (boiled) water
2. Amoebic dysentery	Protozoan: *Entamoebahistolytica*	Avoiding contaminated water and food

Q. Define

1. *Vector*-It is an organism which carries a disease-causing micro organism.
2. *Hygiene*- It is the science and practice of maintaining good health.

Q. Give reason:

1. Why is it necessary to control mosquitoes?

Ans. Mosquitoes spreads disease like malaria, dengue, etc. They carry the germs. When they suck blood, the germs enter into a healthy person. The sound made by the male mosquitoes interrupt sleep.

2. Hands must be washed before eating food.

Ans. Our hands and nails have a large number of germs. These germs cause many diseases.

3. Saline water injection is a must for cholera patient.

Ans. The symptoms of cholera are loose motion and vomiting. The patient loses a lot of water and salt. Urea accumulates in the body. Death may occur if the patient is not treated properly. So, saline water is given to the patient.

39. (i) Write one disease caused by the following

(a) Virus (b) Bacteria

(c) Protozoan (d) Worms

(ii) Why is this important to know the modes of transmission of a disease.

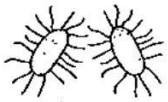
Ans. (i)

	Pathogen	Disease caused by them
(a)	Virus	AIDS
(b)	Bacteria	Tuberculosis
(c)	Protozoan	Malaria, amoebic dysentery
(d)	Worms	Ascariasis, taeniasis

(ii) Modes of transmission is important part of the disease cycle. It's knowledge to expert doctors can prevent the further spread of the disease and outbreak of the disease in the form epidemic can be prevented.

Diagram Based Questions

40. Given below are some diagrams of certain pathogens and disease they cause. Write the scientific name of organism.

S. No.	Pathogens and Disease	Scientific name
(i)	 (Tuberculosis)	.....
(ii)	 (Cholera)	.....
(iii)	 (Typhoid)	.....
(iv)	 Amoebic dysentry	.....

Ans. (i) *Mycobacterium tuberculosis*

(ii) *Vibrio cholerae*

(iii) *Salmonella typhii*

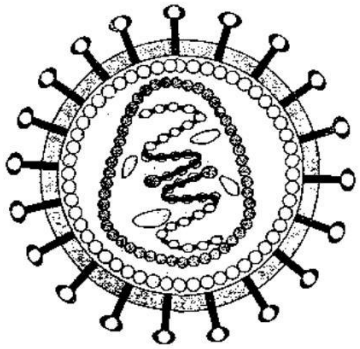
(iv) *Entamoeba histolytica*

41. The figure shows the structure of a AIDS virus.

(i) Name the organism.

(ii) How is this disease transmitted?

(iii) How can the disease be diagnosed?



Ans. (i) HIV

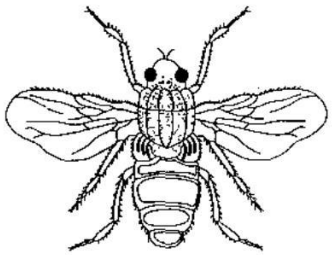
(ii) It is transmitted by

(a) Sexual contact with affected persons.

(b) Blood transfusions.

(iii) ELISA

42. Given below is the figure of a vector. Study this and answer the questions that follow



The figure shows a disease spreading organism.

(i) Name the organism.

(ii) Name the disease spread by this.

(iii) How does it spread disease?

Ans. (i) Housefly.

(ii) Cholera, typhoid.

(iii) It sits on the garbage, faecal wastes, sewage, etc., and the disease causing germs sticks on the of flies body, when it sits on eatables. This transmit germs on food items which enters into the body of man and cause diseases.

Chapter 16. Diseases: Cause And Control

Exercise 1

Q 1. **N**ame the following; (a) term used for worldwide widely spread disease. (b) Vector that transmits malarial pathogen. (c) Protozoan that causes Amoebiasis. (a) Vaccine for tuberculosis

Ans. 1. Pandemic
2. Female Anopheles Mosquito.
3. Entamoeba.
3. BCG.

Q 2. Give the full form of AIDS.

Ans. AIDS Acquired Immunodeficiency Syndrome

Q 3. Define the following.

Ans. (a) Infection: The transmission of disease from one person to another is called infection.
(b) Pathogen: Disease-causing micro-organism is called a pathogen.
(c) Incubation period: Incubation period is the period between the entry of germs and the appearance of the first symptoms of the disease.
(d) Allergen: An antigenic substance capable of producing immediate hypersensitivity allergy is called an allergen.

Q 4. State any two different ways in which infectious disease can spread. The different ways in which infectious diseases can spread are as follows;

Ans. • Direct contact: Person to person, animal to person and expected mother to child
• Indirect contact: Doorknob, phone, etc.
• Droplet transmission: Sneezing, coughing, etc.
• Particle transmission: Air particles can transfer infectious diseases
• Bites and Stings: Mosquitoes, lice, ticks, etc.
• Food Contamination: Food, beverages, etc.

Q 5. Name any two non infectious disease and their cause

NON-INFECTIOUS DISEASES	CAUSE OF THE DISEASE
Asthma	Allergy
Cataract	Ageing
Beri-Beri	Nutritional deficiency
Cancer	Carcinogens like chemicals, tobacco smoking, pollution etc.

Ans. It is important to know how the germs leave the body of a patient as there are some diseases and infections which are transmitted through air, water or just by direct contact. Therefore, to take precautions and protect others from further infections, it is a must to know how the germs leave the body of an infected person.

Q 6. Mention the causative germ, full form and transmission of AIDS.

Ans. Causative germ of AIDS:
HIV (Human immunodeficiency virus)
Transmission of AIDS:
(a) Sexual intercourse
(b) Mother to child transmission
(c) Contaminated blood transfusions

Q 7. Give the full form ofthe following vaccines and name the disease they cure,
(a) BCG: It is a vaccine which is effective against the bacterial disease tuberculosis (TB). It develops immunity to TB. BCG stands for Bacillus Calmette Guerin,

Q 8. Define the following.
(a) **Incubation period:** It is the period between the entry of germs and the appearance of the first symptoms of the disease. Example: Incubation period of pneumonia is 1-3 days.
(b) **Chicken pox;** It is a viral disease caused by the Herpes Varicella zoster virus. It spreads rapidly by close contact with an infected person. A live attenuated vaccine containing Varicella is administered to children of 12-18 months for active immunisation.
(c) **Hepatitis A:** It is a viral disease caused by Hepatitis A virus which results in inflammation of the liver. It has an incubation period of 14-45 days. It is mainly transmitted through contaminated food and water.

Q 9. Name the causative agent, symptom and prevention of the following disease.

Disease	Causative agent	Symptoms	Prevention
Malaria	Protozoan, Plasmodium	Chills, high fever, profuse sweating, severe headache, nausea, vomiting, fatigue and body pain	Destruction of mosquitoes at all stages and avoid mosquito bites by using mosquito nets or repellents
Chicken pox	Virus, Varicellazoster	Highly irritating rashes near the chest and back, gradually spreading to the arms, legs, face and head	Active immunisation by administering live attenuated vaccine containing Varicella
Tuberculosis	Bacterium, Mycobacterium tuberculosis	Persistent cough, afternoon fever, bloody mucus, loss of weight, fatigue and chest pain	BCG vaccination and isolation of the patient

Q 10. Name the following:
1. The vaccine used for polio.
2. A parasite worm.
3. The causative organism of AIDS.
4. The disease caused by round worm
5. A venereal disease.
6. Another name of lockjaw.
7. The part of the body where tuberculosis affects.
8. The organisms which carry disease causing organism

Ans. 1. Salk's vaccine 2. tapeworm 3. HIV, 4. Ascariasis 5. Syphilis 6. tetanus, 7. lungs 8. vectors

Q 11. Complete the following:

1. Mumps is caused by
2. Vaccine used against tuberculosis.
3. Taenia solium is _____
4. Tetanus is caused by _____
5. Vibrio cholera causes
6. Use of disposable syringes is advised for injecting medicines in order to prevent _____

Ans. l—virus, 2-BCG, 3-tapeworm, 4-Clostridium tetani, 5-Cholera, 6-AIDS

Q 12. Write the preventive methods for the following:

1. Rabies- Injection of weakened germs daily for two weeks.
2. Polio- Salk's vaccine.
3. Mumps- Isolation of the patient.
4. Ascariasis- Wash hands before and after meals.
5. Tetanus- DPT vaccine.

Q 13. Difference between:

1.Virus and bacteria

Viruses	Bacteria
They are non-cellular	They are unicellular
They can be crystallised	They cannot be crystallised
They do not show metabolism	They show metabolism

2. Epidemic and endemic diseases

Epidemic	Endemic
A disease that affects a large number of people at the same time, e.g-plague	It affects a fewer people and found in a certain area, e.g-yellow fever

Chapter 17. Aids To Health

Exercise 1

Q 1. Name the following: (a) Full form of DTP. (b) Date on which World Health Day is celebrated (c) A drug containing arsenic (d) The first discovered antibiotic (e) Two antiseptics (f) Two disinfectants (g) Two antibiotic (h) Vaccine given for polio

Ans. (a) Diphtheria, Tetanus & Pertussis
(b) April 7
(c) Arsphenamine or Salvarsan
(d) Penicillin
(e) Antiseptics — Lysol, iodine, boric acid and carbolic acid.
(f) Disinfectants — Cresol and phenol
(g) Antibiotics — Ampicillin and penicillin
(h) Salk's Vaccine

Q 2. Mention the full form of (i) AIDS (ii) BCG (iii) DPT (iv) WHO

Ans. (i) Acquired Immuno Deficiency Syndrome
(ii) Bacillus of Calmette Guerin
(iii) Diphtheria, Pertussis and Tetanus
(iv) World Health Organization

Q 3. What are antibodies?

Ans. Antibodies are immunoglobulin which are produced in the blood to fight and destroy harmful microbes.

Q 4. Differentiate between the following on the basis of what is mentioned in the brackets.
(a) Antiseptic & antibiotic (definition)
(c) Disinfectants and Deodorants (definition)
(d) Vaccination & sterilization (definition)
(e) Active immunity & passive immunity (definition)
(f) Innate immunity & acquired immunity (definition)

Ans. (a) Antiseptic is a mild chemical substance which is applied to the body to kill germs, whereas an antibiotic is a chemical substance produced by a microorganism which can kill or inhibit the growth of some other disease-producing microorganisms.

(b) Antiseptic is a mild chemical substance which is applied to the body to kill germs, whereas a disinfectant is a strong chemical applied to spots or places on the body where germs thrive and multiply.

(c) Disinfectant is a strong chemical applied to spots or places on the body where germs thrive and multiply, whereas deodorants are neither antiseptics nor disinfectants; they are aerosols used to mask a bad smell.

(d) Vaccination is the introduction of any kind of dead or weakened germs into the body of a living being to develop immunity (resistance) against a disease, whereas sterilization is a process of eliminating or killing all the microbes present on a surface, contained in a fluid, in medication or in a compound such as biological culture media.

(e) Active immunity is the immunity developed by an individual due to a previous infection or antigen which enters the body naturally, whereas passive immunity is the immunity provided to an individual from an outside source in the form of readymade' antibodies,

(f) Innate immunity is the immunity by the virtue of genetic constitutional makeup, i.e. it is inherited from parents. It is present in the body without any external stimulation or a previous infection, whereas acquired immunity is the resistance to a disease which an individual acquires during a lifetime, It may be the result of either a previous infection or from readymade antibodies supplied from outside.

Q 5. Name any three vaccines & the disease for which they provide immunity.

Ans. (i) TAB vaccine for typhoid
(ii) BCG vaccine for tuberculosis
(iii) DTP vaccine for diphtheria, tetanus and whooping cough

Q 6. Choose the odd one out giving reasons.

Ans. (a) Lysol, benzoic acid, DDT, mercurochrome Antiseptics. DDT is a wrong example for this category as it is a disinfectant which is not good for human skin.
(b) Formalin, iodine, Lysol, phenol, Disinfectants. Iodine is a wrong example as it is an antiseptic.
(c) BCG, DTP, ATP
Vaccines. ATP is a wrong example as it is an energy carrier in the cells of all known organisms.(d) Tears, skin, nasal secretion, HCl (in stomach)
Germ-killing secretions. Skin is a wrong example as it is a protective mechanical barrier and prevents the entry of germs in our body.

Q 7. Name the diseases cured & the nature of preparation of the following vaccines (ii) TAB
(ii) Salk's vaccine (iii) BCG.

Ans.

Vaccine	Disease(s)	The Nature of Vaccine
TAB	1. Typhoid	2. Killed germs
Salk's Vaccine	3. Poliomyelitis	4. Killed germs
BCG	5. Tuberculosis	Living weakened germs

Q 8. State two uses of antibiotics.

1. Antibiotics have a wide use in medicine to fight infections.
2. Certain antibiotics are used as food preservatives, especially for fresh meat and fish.
3. Some antibiotics are used in treating animal feed to prevent internal infection.
4. Some antibiotics are used for controlling plant pathogens.

Merits of local defence systems:

1. Local defence systems start working instantaneously.
2. These systems are not dependent on previous exposure to infections.
3. They are effective against a wide range of potentially infectious agents.

Q 9. An abnormally increase count of WBC is indicative of some infection. Account for this.

Ans. Whenever a germ or infection invades the body, a signal is sent to the immune system to produce specific antibodies. To cope with the number of germs being multiplied inside the body, white blood cells start multiplying rapidly. This enables them to produce more number of antibodies and stop the infection in time, So, abnormally large numbers of WBCs in the blood are usually an indication of some infection in our body.

Q 10. Define with examples: (i) Antiseptics (ii) Disinfectants (iii) Vaccines

Ans. (a) **Antiseptics:**

Antiseptics are mild chemical substances applied to the body which prevent the growth of some bacteria and destroy others.

Examples: Lysol and iodine

(b) **Disinfectants:**

Disinfectants are chemicals which kill microorganisms they come in contact with. Disinfectants are usually too strong to be used on the body.

examples: Cresol and phenol

(c) **Vaccines:**

Vaccines are materials administered in the body to provide passive immunity. The materials are generally germs or substances secreted by germs.

Examples: OPV (oral polio vaccine) and DTP (diphtheria, tetanus and pertussis)

Solution C. 10.

(a) Bleeding from a cut in the skin:

• In case of bleeding, raise the affected part to minimize blood flow.

• Wash the cut surface with clean water.

• Press the area with a piece of clean cotton and apply some antiseptic.

(b) A fractured arm:

• Lay the victim comfortably, loosen or remove the clothes from the affected part.

• Do not move the fractured part.

• If the affected limb is an arm, then tie a sling around the neck to rest the arm in it.

(c) Stoppage of breathing due to electrical shock:

• Lay the victim fiat on the back and put a pillow or folded towel under the shoulders in a way that the chest is raised and the head thrown back.

• Hold and draw the arms upwards and backwards. This will cause the chest to expand and draw in air.

• Next, fold the victim's arms and press them against the ribs. The air will now be expelled.

• Repeat the two steps at the rate of about 15 times per minute. Continue till the victim starts breathing without any extra help or till the doctor arrives.

Solution D. 1.

• Vaccination is the practice of artificially introducing germs or the germ substance into the body For developing resistance to particular diseases.

• Scientifically, this practice is called prophylaxis and the material introduced into the body is called the vaccine.
• The vaccine or germ substance is introduced into the body usually by injection and sometimes orally (e.g. polio drops).
• Inside the body, the vaccine stimulates lymphocytes to produce antibodies against the germs for that particular disease.
• Antibodies are an integral part of our immunity. Their function is to destroy the unwanted particles which enter the body.
• Vaccines give our immunity a signal to produce specific antibodies. Hence, the principle of vaccination is to produce immunity against a disease.

Solution D. 2.

Whenever a germ or infection invades the body, a signal is sent to the immune system to produce specific antibodies. To cope with the number of germs being multiplied inside the body, white blood cells start multiplying rapidly. This enables them to produce more number of antibodies and stop the infection in time. So, abnormally large numbers of WBCs in the blood are usually an indication of some infection in our body.

Q Define the following:

Ans. 1. Disinfectant- Chemicals that are applied on the places where microorganisms thrive and multiply.
2. First aid- the treatment given immediately to a patient before any medical help is available to the person.
3. Serum- it is the blood devoid of fibrinogen and provide passive immunity.
4. Toxin- Any poisonous substance produced by the metabolic activity of the pathogen that are harmful to the body.
5. Immunization- It is the process by which the body is protected against disease by inoculating the person with vaccine.

Q Name the following:

1. Any three germ killing secretions of the body.
2. The organization that suggests quarantine measures to prevent the spread of diseases.
3. An organization that looks after maternal and child welfare centers.
4. The term used for substances which when applied on the body kill microorganisms.
5. The chemicals found in the blood which act against the specific microbe.
6. The practice of artificially introducing the germs or the germ substance into the body for developing resistance to particular disease.
7. The serum containing antibodies
8. The day celebrated as World health Day'.
9-The antibiotic which was first discovered.
10. The type of immunity which already exists in the body due to genetic make up of an individual.

Ans. 1. tear, saliva, sebum and sweat, 2. WHO, 3. Red Cross Society, 4. antiseptic 5. antibodies, 6. vaccination, 7. Antiserum, 8. April,7. penicillin 10. Natural immunity

Q Complete the following:

1. Vaccine is a___ preparation consisting of microbes which help to build immunity in the human body.
2___. are foreign substances that stimulate the immune system to produce antibodies.

3. Serum gives____
4. DPT vaccine provides immunization against _____
5. Penicillin obtained from a fungus___

Ans. 1. dead/weakened, 2. antigens, 3. passive immunity, 4. Diphtheria, pertussis, Tetanus, 5- antibiotic

Q Give the technical term for the following:

1. WBC's squeeze through the walls of the capillaries into the tissue.
2. A group of chemicals which are used against bacterial diseases.
3. Immunity developed by providing readymade antibodies.
4. The extracts of toxins secreted by bacteria

Ans. 1. Diapedesis, 2. sulphonamides, 3. Passive Immunity 4. Antitoxins

Chapter 18. Health Organisatons

Exercise 1 Qi. Date that is celebrated as Red Cross Day. ii) Place where WHO headquarters is located

Solution

1. (a) May 8
2. (c) Geneva

Solution B.1.

Column I (Activity)	Column II (Organisation)
(i) To extend relief to victims of earthquake.	Red Cross
(ii) To lay pharmaceutical standards for important drugs.	WHO
(iii) Arranging ambulance in emergencies.	Red Cross
(iv) To suggest quarantine measures.	WHO
(v) Training of midwives.	Red Cross
(vi) Procuring and supplying blood for transfusion.	Red Cross

Solution 6.2.

The headquarters of WHO is located in Geneva.

Solution B.3.

(a) WHO: World Health Organization

(b) UNO: United Nations Organization

Q3 Mention the health problems existing in India

Health problems in India:

1. Food- and water-borne diseases:

Contaminated food and water cause several diseases.

Water-borne diseases occur due to contaminated water from hand pumps or mixing of untreated sewage with river water.

2. Insect- and air-borne diseases:

Lack of cleanliness leads to breeding of houseflies and mosquitoes which are carriers of certain diseases.

3. Iack of medical facilities:

Lack of medical facilities especially in rural areas leads to unavoidable deaths and damage to health. Lack of knowledge and superstitious beliefs also delay timely treatmenit which may result in serious consequences.

Solution C.2.

Functions of WHO:

1. To promote and support projects for research on diseases

2. To collect and supply information about the occurrence of diseases of an epidemic nature such as cholera, plague and yellow fever

Solution C.3.

Functions of Red Cross:

1. To extend relief and help to the victims of any calamity — flood, fire, famine and earthquake
2. To procure and supply blood for needy victims of war and other calamities
3. To extend all possible first-aid in an accident
4. To arrange for ambulance services in emergencies

Q5State four functions of WHO

Functions of World Health Organization (WHO):

1. To promote and support projects for research on diseases
2. To collect and supply information about the occurrence of diseases of epidemic nature such as cholera, plague and yellow fever
3. To lay pharmaceutical standards for important drugs, to ensure purity and size of the dose
4. To organise campaigns for the control of epidemic (widespread) and endemic (local) diseases

Solution D.L

• The World Health Organization (WHO) is a specialised agency of the United Nations (UN) which is concerned with international public health.
• It was established on 7 April 1948, with headquarters in Geneva, Switzerland, and is a member of the United Nations Development Group.
• Member countries of the UNO focused on the need for creating an international body to look after the health problems of the people of the world.
• This need was particularly felt in the field of research on the causes and cures of diseases.
• Combined efforts in this direction were to give better and faster results.
• Poor and developing countries were to benefit quickly.

*

Chapter 19. Waste Generation and Management

Exercise 1.

Q. 1. Name the following :
(a) Most convenient reusable waste.
(b) The most rapidly increasing & much harmful waste today.

Ans. 1. (a) Old newspapers
2. (b) plastics

Q. 2. Give scientific terms for the following:
a. The solid precipitated material produced during secondary treatment of effluents
b. A commonly used device used for removing particulate air pollutants.

Ans. 1. (a) Sludge
2. (b) Scrubber, Plate type electrostatic precipitator

Q. 3. Differentiate between degradable & non degradable wastes (definition & example)

DEGRADABLE WASTE	NON-DEGRADABLE WASTE
The waste that can be decomposed by micro-organisms is called degradable waste.	The waste that cannot be decomposed by micro-organisms is called non-gradable waste.
E.g. Vegetable peel, paper, cloth etc	**E.g. Plastic**

Q. 4. Match the items in Column I with the items in Column II.

Column I	Column II
1. Cow dung	(iii) Manure
2. Bagasse	(i) Sugarcane
3. Old newspapers	(ii) Raddiwalas

Q. 5. Give reasons for the following :
(a) Broken glass utensil are a kind of non-degradable waste.

Ans. (a) Broken glass utensil are a kind of non-degradable waste as they cannot be decomposed and broken down by living micro-organisms. These need to be disposed off in deep dug out pits so that they do not cause any harm. However, sometimes broken glass in large quantities can be used in glass industries after melting them.

(b) Landfills are coming up fast near large cities.

Ans. (b) Landfills are coming up fast near large cities due to huge population growth and lack of using efficient and safe disposal method. As construction activities are very active, new colonies are being raised and construction units have become very active, these produce

large quantities of waste stones, pebbles, broken bricks and wood waste. Mostly, these are used as landfills. One can see heaps of landfills in the suburbs.

(c) Municipal sewage is first separated into degradable and non-degradable waste.

(c) Municipal sewage is first separated into degradable and non-degradable wastes because degradable wastes can be broken down into non-toxic waste in septic tanks, while non-degradable waste needs to be dumped or buried at safe places to avoid any hazardous effects.

Q. 6. Define E - Waste with example.

Ans. Electronic waste is the waste generated by discarded electrical appliances.

Items which come under the category of electronic waste are

1. Fluorescent tubes
2. Medical instruments
3. Toys
4. Lead acid batteries
5. Mobile phones
6. Radios

Q. 7. Mention some common mining wastes & state how these can be used.

Ans. Common wastes produced in mining operations are

Coal, Dust, Iron, Copper, Zinc, etc.

Reusing of wastes produced in mining operation :

During operation of getting minerals, a large quantity of waste material is produced called mine tailing. It is the left over. The mine tailing with materials is used to produce tiles and masonry cement.

Q. 8. Define Composting &state the procedure to produce compost.

Ans. The rotting and conversion of organic waste into manure is known as composting. The product formed after composting is called compost.

Method of preparing compost:

1. A trench of about 5 m long, 1.5 m wide and 1.5 m deep is dug.
2. A 30 cm thick layer of well-mixed refuse and waste is spread on it. This layer is completely wetted with a watery mixture of cow dung and some mud.
3. A second layer of mixed refuse is spread over the first layer, till the heap rises about half a meter.
4. The set-up is kept undisturbed for about 3 months, during which water is sprinkled over it at regular intervals.
5, A trench is then dug, its material is taken out and rearranged in conical heaps and covered with a layer of soil.
6. After 50-60 days, compost is ready for use in cultivation fields or in garden flower beds, etc.

Q. 9. Mention usefulness & precautions of incineration.

Ans. Usefulness of incineration of wastes:

- It reduces the weight of the waste.
- It reduces the volume of the waste.
- It renders toxic wastes into less toxic or even non-toxic wastes.

Precautions required for incineration:

- It should be carried out at very high temperatures.
- It should be equipped with pollution control devices.
- It should be installed away from residential areas.

Q. 10. Name the following:

1. The waste generated from the household,
2. Dumping waste in a certain area and covering it with soil.
3. An e-waste
4, The waste water that run off into the drains,
5. The waste that can be decomposed by microorganisms.
6. A common non-biodegradable waste,
7. The common waste released from cement factory.
8. The machine that incinerate the waste,
9. Conversion of biodegradable waste into manure.
10. The machine that separates suspended wastes by using electric field,

Ans. 1. domestic waste, 2. landfill, 3. CD, 4. sewage, 5. biodegradable waste, 6. plastic, 7. fly ash, 8. incinerator, 9. composting, 10. electrostatic precipitator

Q. 11. Define the following:

1. Incineration- Reducing the weight and volume of solid waste by burning it at high temperature.
2. Compost- It is the manure obtained by decomposing biodegradable waste by microorganisms,
3, E-waste- It is the waste, generated from the discarded electronic devices.
4. Segregation- means separating the wastes as reusable, degradable and non-degradable.
5. Drainage- removal of waste water or sewage by drains from a given area.

Q. 12. Give reasons:

1. Non-biodegradable waste cannot be broken down.
2. Disposal of discarded radioactive materials need care.
3, Plastic should not be burnt.
4. E- bins must be kept for e-wastes.

Ans. 1. Breaking down of wastes is done with the help of microorganisms which have enzymes to convert them into simpler substances. But all enzymes are specific in their actions. The enzymes don't work on non-biodegradable materials,

2. Radioactive materials release harmful substances which are a health hazard to human.

3. Plastic when burnt produces a lot of gases. Inhaling these gases causes many diseases such as cancer,

4. e-waste is the waste generated by discarded electronic items such as cell phones, CDs, etc. The main wastes present in these materials are lead, mercury, etc. These are non-biodegradable and also cannot decomposed