M.R.VIVEKANANDA MODEL SCHOOL

DWARKA,SECTOR-13

CLASS - IX

Dear Parents Greetings!

The academic session 2020-21 could not begin as the way we wanted it and even we couldn't welcome our students in their new class because of the pandemic COVID-19.We at MRV school always strive to go extra miles for our students and try to provide them with quality education. Please find herewith the Holiday Homework for your ward to be done by them in your guidance. Hopefully, schools may start functioning in its normal course w.e.f. 1.7.2020

All the phone numbers you are connected with will be operational during the vacation for your convenience.

Looking forward for your support and cooperation in future too. Warm regards

- Social Science
- Mathematics
- Science
- English
- Hindi

CLASS 9

SOCIAL SCIENCE -HOLIDAY HOMEWORK

1. Project work on Disaster Management

Significance of doing a project on disaster management in social science

The aim of this project is to raise awareness about the challenges posed by natural and man made disaster and create consciousness about disaster management.

As students of social sciences and as responsible citizens, doing a project on disaster management is going to give you a first-hand experience and opportunity to understand the meaning ,causes and effects of disasters but also to learn the essentials of disaster preparedness .

THEME :"Disaster Management"

OBJECTIVE

To research and analyse the causes and effects of Natural & Human made disasters and Suggest a mitigation plan. Explain all these disasters briefly.

GUIDELINES

- The total length of the Project should not be more than **20 pages** of **A-4 size** paper.
- The project need to be **handwritten**.
- illustrations and creative use of materials.
- The project should be presented in a **neatly bound** simple folder.
  The project report will be developed and presented in the following order:
- **Page- 1** Cover Page showing project title, student information, school and year.

  Page-2 Contents: List of contents with page numbers. **Page-3** Acknowledgements: Acknowledging the institution, offices and libraries visited and persons who have helped.
  Page- 4 Project Overview: Purpose, Aim, Methodology and experiences while doing the project.

  Page- 5 to Page- 12 Subject Matter: Chapters with relevant headings and illustrations.
  Page- 13 Conclusions: Based on findings. (Summary and Suggestions)
  Page- 14 New findings

Page -15 Suggestions and recommendations

Page-16 Bibliography: It should have the title, pages referred, author, publisher, year of publication and if a website the name of the website with the specific website link which has been used.

- All the photographs & sketches should be labelled and well organised

2.“At the end of 2019, a new type of coronavirus started spreading in China. This type of coronavirus is often called *2019-nCoV*, *novel coronavirus*, or *COVID-19*. It is believed that the virus was transmitted from animals to humans. The best way to prevent and slow down transmission is to be well informed about the COVID-19 virus, the disease it causes and how it spreads.”

On the basis of information given above, find out more information about Coronavirus and answer the following questions. **(to be done in notebook)**

a. What is Covid-19? From where coronavirus got its name**?**
b. What are its symptoms?
c. What are the precautions that need to be taken to protect from the coronavirus?
d. What according to you is ' Social Distancing'? How is ' self -isolation' different from ‘quarantine’?
e. What measures have been taken by the government to control the spread of COVID-19?

3. Make one scrap file for maps. This file of map will be used for upcoming chapters also. In this file all maps of Social Science will be pasted.

- Take scrap file with around 25 to 30 Pages.
- Paste the following maps in scrap file(One Side Ruled One Side Plain).
- Paste map on plain side and write information related to that on ruled side.

MAP WORK- 1(GEOGRAPHY)

Chapter -1 India:Size and Location(Geography)

(i) **Political -Map 1**

(a) Tropic of Cancer (Also locate the states on tropic of cancer)

(b) Standard Meridian

(c) Latitudinal extent and Longitudinal extent

(d) Southernmost point of India

(e) Northernmost point of India

(f) Easternmost point

(g) Westernmost point

(ii) **Political Map- 2**

(a) Neighbouring Countries

(b) Islands

(iii) **Political Map- 3**

(a) States with capitals

(b) Union Territories

(iv) **Political map-4**

(a) States sharing international boundaries with India.

. **MAP WORK -2(HISTORY)**

Locate and label the following on the physical map of France from the Chapter 1 (history) "**The French Revolution**":

Bordeux, Nantes, Paris, Marseilles.

4.Learn and revise all the chapters covered till now.

HOLIDAY HOMEWORK
MATHEMATICS CLASS -IXth

1) Do these activities in school lab manual
*Represent the square root on the number line
*Factorization of polynomial
*Algebraic identity (a + b)2 and (a - b) 2
*Surface area of cylindrical object
*Curved surface area of a cone
* Relation between the volume of cone , cylinder , and a Hemisphere.
* Surface area of a sphere.
*Experimental probability of outcome of die.

2) Do project according to your roll no. On chart/ A3/A4
Roll no. 1 to 20 : Search 5 new mathematical symbols collect information about their origin, meaning , and their use in different areas of mathematics.
Roll no. 21 - onwards : Draw histogram to represent the runs scored by the winning team in the final match of IPL 2019 in different overs. Represent overs on the x-axis (class interval 0-2, 2-4 .....) and runs scored on y-axis.
3) Do the given assignments in separate notebook .
Stay at home and Stay safe😷

Class : IX **Subject : Mathematics** **Assignment 1: Number System**

1. Explain each of the following in $\frac{p}{q}$ form:

2. (i) 0.675 (ii) $0.3\overline{2}$ (iii) $0.12\overline{3}$ (iv) $0.003\overline{52}$ (v) $4.\overline{32}$ (vi) 2.317317317.....

3. Find two irrational numbers and two rational numbers between 0.5 and 0.55

4. Simplify each of the following by rationalizing the denominator.

5. (i) $\frac{7+3\sqrt{5}}{7-3\sqrt{5}}$ (ii) $\frac{2\sqrt{3}-\sqrt{5}}{2\sqrt{2}+3\sqrt{3}}$ (iii) $\frac{7\sqrt{3}-5\sqrt{2}}{\sqrt{48}+\sqrt{18}}$

6. Simplify:- a) $3\sqrt{5}+-\sqrt{5}+\sqrt{180}$ (b) $\sqrt{54}+\sqrt{150}$

7. Give an example each of two irrational numbers, whose

   (i) difference is a rational number
   (ii) difference is an irrational number
   (iii) sum is a rational number
   (iv) sum is an irrational number
   (v) product is a rational number
   (vi) product is an irrational number
   (vii) quotient is a rational number
   (viii) quotient is an irrational number

8. Without actual division decide which of following rational numbers have terminating decimal representation:-

   (i) $\frac{33}{375}$ (ii) $\frac{15}{28}$ (iii) $\frac{16}{45}$ (iv) $\frac{12}{35}$ (v) $\frac{80}{27}$ (vi) $\frac{123}{1250}$

9. Examine whether the following numbers are rational or irrational

10. (i) $\frac{3\sqrt{8}}{\sqrt{2}}$ (ii) $\left(\sqrt{2}+\frac{1}{\sqrt{2}}\right)^2$ (iii) $\frac{22/7}{511}$ (iv) $(3+\sqrt{2})(2-\sqrt{3})(3-\sqrt{2})$

    $(2+\sqrt{3})$

11. Represent $\frac{8}{5}$ and $\sqrt{20}$ on a number line.

12. (a) Represent $\sqrt{5.2}$ on a number line. (b) Visualize 0.436 on the number line

13. Insert 6 rational numbers between $-\frac{2}{3}$ and $\frac{3}{4}$

14. Find two irrational numbers between $\sqrt{3}$ and 2.

15. Rationalise the denominator of $\frac{1}{1-\sqrt{7}}$

16. Given $\sqrt{3} = 1.732$ app., find to three places of decimal the value of $\frac{1+2\sqrt{3}}{2-\sqrt{3}}$

17. Find the values of 'a' and 'b' if

18. (a) $\frac{5+2\sqrt{3}}{7+4\sqrt{3}} = a + b\sqrt{3}$ (b) $\frac{5+\sqrt{3}}{\sqrt{5}-\sqrt{3}} = \frac{1}{2}a + 3b\sqrt{15}$

19. Simplify:- (a) $\frac{3}{\sqrt{5}-\sqrt{3}}$ (b) $\frac{2\sqrt{7}}{\sqrt{5}+\sqrt{3}}$

Maths Work Sheet

Class - IX **Chapter:- Polynomials**

Q01 :/ **Factorize the following by splitting the middle term:**

a) $3x^2 + 19x + 30$
b) $2\sqrt{2}x^2 + 9x + 5\sqrt{2}$
c) $4x^2 - 13x + 10$

Q02 :/ **Factorize the following by Factor theorem:**

a) $x^3 + 9x^2 + 23x + 15$
b) $x^3 + 6x^2 + 11x + 6$

Q03 :/ **Factorize the following by using a suitable identity:**

a) $4x^2 + 12xy + 9y^2$
b) $2a^5 - 54a^2$
c) $2\sqrt{2}x^3 + 3\sqrt{3}y^3$
d) $x^3 - x$
e) $x^6 - y^6$
f) $(a-b)^3 + (b-c)^3 + (c-a)^3$
g) $x^8 - y^8$
h) $27x^3 - 135x^2 + 225x - 125$

Q04 :/ **Evaluate the following using a suitable identity:**

a) 998^3
b) 10.2^3
c) $998^2 - 4$
d) $999^2 - 1$
e) $(-25)^3 + 10^3 + 15^3$
f) 10.2×9.8

Q05 :/ **If 5 is a zero of $x^3 + kx^2 + 2x + 8$, find k.**

Q06 :/ **If $(x-2)$ is a zero of $x^3 - 4x^2 + kx - 8$, find k.**

Q07 :/ **If $(x-2)$ and $(x+3)$ are factors of $x^3 + ax^2 + bx - 30$, find a and b.**

Class: IX **Subject : Mathematics** **Assignment 2: Polynomials**

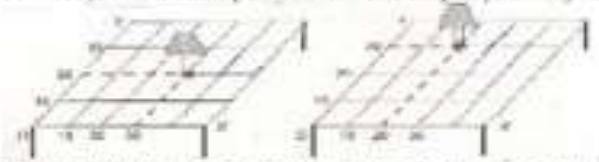
1. If two polynomials $ax^3 + 4x^2 + 3x - 4$ & $x^3 - 4x + a$ leave the same remainder when divided by $(x - 3)$, find the value of a.
2. Evaluate using identities:- (a) 103 x 97 (b) $(0.99)^2$ (c) 105^2
3. Find the remainder when $4x^3 - 3x^2 + 2x - 4$ is divided by $x+2$.
4. Show that $(x - 1)$ is a factor of $x^{99} - 1$
5. Find the value of a, if $(x - a)$ is a factor of $x^3 - a^2x + x + 2$.
6. Determine the value of a for which the polynomial $2x^4 - ax^3 + 4x^2 + 2x + 1$ is divisible by $(1 - 2x)$.
7. Factorize the polynomials:-
   (a) $x^3 - 6x^2 + 11x - 6$ (b) $(a^2 - b^2)^3 + (b^2 - c^2)^3 + (c^2 - a^2)^3$
   (c) $x^3 + 13x^2 + 31x - 45$ given that $x + 9$ is a factor
   (d) $8x^3 + 27^3 + z^3 - 18xyz$ (e) $(a + b)^3 + (b + c)^3 + (c + a)^3 - 3(a + b)(b + c)(c + a)$
8. Factorize:-

   (a) $a^3 - 0.216$ (b) $2x^2 - \frac{5}{6}x + \frac{1}{12}$ (c) $(x + 1)^3 + (x - 1)^3$

9. Give possible expressions for the length and breadth of a rectangle having $A = 35y^2 + 13y - 12$ (Area).
10. Evaluate using a suitable identity:- $(1.93)^3 + (0.07)^3 - (2)^3$
11. Find the product: $(2x - y + 3z)(4x^2 + y^2 + 9z^2 + 2xy + 3yz - 6xz)$
12. Factorize by splitting the middle term :
    (a) $9x^2 - 3x - 9$ (b) $x^2 + 14x + 40$ (c) $5x^2 + 16x + 3$

Class: IX **Subject : Mathematics** **Assignment 3: Coordinate Geometry**

1. Write the coordinates of a point which:-
   (a) Lies on the x-axis and is at a distance of 4 units to the right of the origin.
   (b) Lies on the y-axis and is at a distance of y units below the x-axis.
   (c) Is at a distance of 3 units from the x-axis and 7 units from the y-axis. [there would be four such points]
2. Draw the graphs of the eqs:-
   (a) $3x - 2y = 7$ (b) $y = -2$
   on the same pair of axes. Read the coordinates of their point of intersection.
3. Find the point where the line represented by the equation $5y - 3x - 10 = 0$ cuts the y-axis.
4. Draw the graph of the line $3x + 4y = 18$. With the help of graph find value of y when $x = 2$. (show this point on the graph)
5. On a graph draw a quadrilateral whose vertices are (1,1), (2,4), (8,4) and (10,1). Justify the quadrilateral.
6. How will you describe the position of the table lamp on your study table to another person?



7. Draw the graph of $y = 2x + 4$. Use the graph to find the area between the line and the axes.
8. In which quadrant will the point lie, if :-
   (a) ordinate is 3 and abscissa is – 7
   (b) abscissa is – 10 and ordinate is – 4
   (c) Ordinate is 4 and abscissa is – 6.
9. Fill in the blanks:-
   (a) The coordinates of the origin O are .....
   (b) The y coordinate of every point on the x-axis is .....
   (c) Distance along the x-axis is called .....
   (d) Distance along the y-axis is called .....
   (e) The point (x,y) = (y,x) only if .....

TOPIC: LINEAR EQUATIONS IN TWO VARIABLES — CLASS: IX

1. Find two solutions of the linear equation $5x - 4y = -8$
2. Draw the graph of the linear equation $2x + 3y = 12$. At what points the graph of the equation cuts the x – axis and the y axis
3. Draw the graphs of the equations $x + y = 6$ and $2x + 3y = 16$ on the same graph paper. Find the coordinates of the points where the two lines intersect
4. Draw the graph of the following equation $2(x + 1) = 3 (y - 1) - 4$ and check whether the point (3, -1) lies on the line
5. Draw the graph of $y = -5$ and $y = 5$ on the same graph. Are the lines parallel? Find the point of intersection of two lines
6. The taxi fare in a city is such that Rs 50 is fixed amount and Rs 16 per km is charged. Taking the distance covered as x km and total fare as Rs y, write a linear equation in x and y
7. If present age of son and father are expressed by x and y respectively and after ten years father will be twice as old as his son. Write the relation between x and y
8. If the cost of 5 tables exceeds the cost of eight chairs by Rs. 150. Write the linear equation in two variables to represent the statement. Also find the cost of 1 table if the cost of one chair is RS. 240
9. Give the geometric representation of $2x + 1 = x - 4$ as an equation in (a)one variable (b) two variable
10. Give the equation of two lines passing throw (2, 14). How many more such lines are there and why
11. If (2, 5) is a solution of the equation $2x + 3y = m$, find the value of m (m = 19)
12. For what value of k does the point (k, -3) lies on the line $3x - y = 6$ (k = 1)
13. Write $13x - 12y = 25$ as $y = mx + c$. Hence find m and c. Verify if $x = 1$, $y = 1$ is a solution (m= 13/12, c = - 25/12)
14. If (2, 3) and (4, 0) lie on the graph of the equation $ax + by = 1$. Find the value of a and b. Plot the graph of the equation obtained (a =1/4, b = 1/6)
15. Express y in terms of x, given that $x/5 + 2y = 3$. Check whether (-5, 2) is asolution of the given equation
16. Write each of the following as an equation in two variables (in standard form):
    (a) $x = -5$ (b) $y = 2$ (c) $2x = 3$ (d) $5y = 2$
16. Frame a linear equation in the form $ax + by + c = 0$ by using the given values of a, b and c : $a = -2$, $b = 3$, $c = 4$

1. A car moves 100 m due east and then 25 m due west. (a) What is the distance covered by the car? (b) What is its displacement?

2. A person walks along the sides of a square field. Each side is 100 m long. What is the maximum magnitude of displacement of the person in any time interval?

3. In the hare–tortoise race, the hare ran for 2 min at a speed of 7.5 km/h, slept for 56 min and again ran for 2 min at a speed of 7.5 km/h. Find the average speed of the hare in the race.

4. A bus takes 8 hours to cover a distance of 320 km. What is the average speed of the bus?

5. The maximum speed of a train is 80 km/h. It takes 10 hours to cover a distance of 400 km. Find the ratio of its maximum speed to its average speed.

6. An object moves through 10 m in 2 minutes and next 10 m in 3 minutes. Calculate its average speed.

7. A car moves through 20 km at a speed of 40 km/h, and the next 20 km at a speed of 60 km/h. Calculate its average speed.

8. A boy leaves his house at 9.30 a.m. for his school. The school is 2 km away and classes start at 10.00 a.m. If he walks at a speed of 3 km/h for the first kilometre, at what speed should he walk the second kilometre to reach just in time?

9. A bus moves at a uniform speed v_1 for some time and then with a uniform speed v_2. The distance–time table is given below. Plot the corresponding distance–time graph and answer the following questions.

Time (min)	Distance (km)
0	0
20	20
40	40
60	65
80	95
100	125
120	155

(a) Find the values of v_1 and v_2.

(b) When did the bus change its speed?

(c) What is the distance covered in the first hour?

(d) What is the distance covered in the second hour?

(e) What is the average speed for the complete journey?

10. A bicycle increases its velocity from 10 km/h to 15 km/h in 6 seconds. Calculate its acceleration.

11. An object moves along a straight line with an acceleration of 2 m/s^2. If its initial speed is 10 m/s, what will be its speed 5 s later?

12. An object dropped from a cliff falls with a constant acceleration of 10 m/s^2. Find its speed 2 s after it was dropped.

13. A bullet hits a wall with a velocity of 20 m/s and penetrates it up to a distance of 5 cm. Find the deceleration of the bullet in the wall.

14. A train starts from a station and moves with a constant acceleration for 2 minutes. If it covers a distance of 400 m in this period, find the acceleration.

15. A ship moving with a constant acceleration of 36 km/h^2 in a fixed direction speeds up from 12 km/h to 18 km/h. Find the distance traversed by the ship in this period.

16. A particle starts from a point with a velocity of +6.0 m/s and moves with an acceleration of $-2.0\ m/s^2$. Show that after 6 s the particle will be at the starting point.

17. A bicycle moves with a constant velocity of 5 km/h for 10 minutes and then decelerates at the rate 1 km/h^2, till it stops. Find the total distance covered by the bicycle.

18. An object is moving along a straight line with a uniform speed of 10 m/s. Plot a graph showing distance versus time from $t = 0$ to $t = 10$ s.

19. A particle moves along a straight line with a uniform velocity of 5.0 m/s. Plot a distance–time graph for the period $t = 0$ to $t = 5$ s.

ASSIGNMENT-1
MATTER IN OUR SURROUNDINGS

Fill in the blanks:

(a) At room temperature the forces of attraction between the particles of solid substances are———than those which exist in the gaseous state.
(b) The arrangement of particles is less ordered in the ——— state. However, there is no order in the ——— state.
(c) ——— is the change of gaseous state directly to solid state without going through the ———state.
(d) The process of intermixing of particles from high level to low level is called_____.

Short Answer Questions

1. Compare solids, liquids and gases on the basis of compressibility, rate of diffusion and density and kinetic energy
2. A rubber band changes its shape when stretched. Can it be regarded as solid?
3. Explain why diffusion occurs more quickly in a gas than in a liquid?
4. Arrange the following substances in the decreasing order of forces of attraction.
   Water, chalk, honey, iron rod, CNG

LONG ANSWER QUESTIONS

1 Explain with the help of activity that the rate of diffusion increases with increase in temperature.
2 What are fluids? Give an example. Draw the arrangement of particles in solids, liquid and gases.

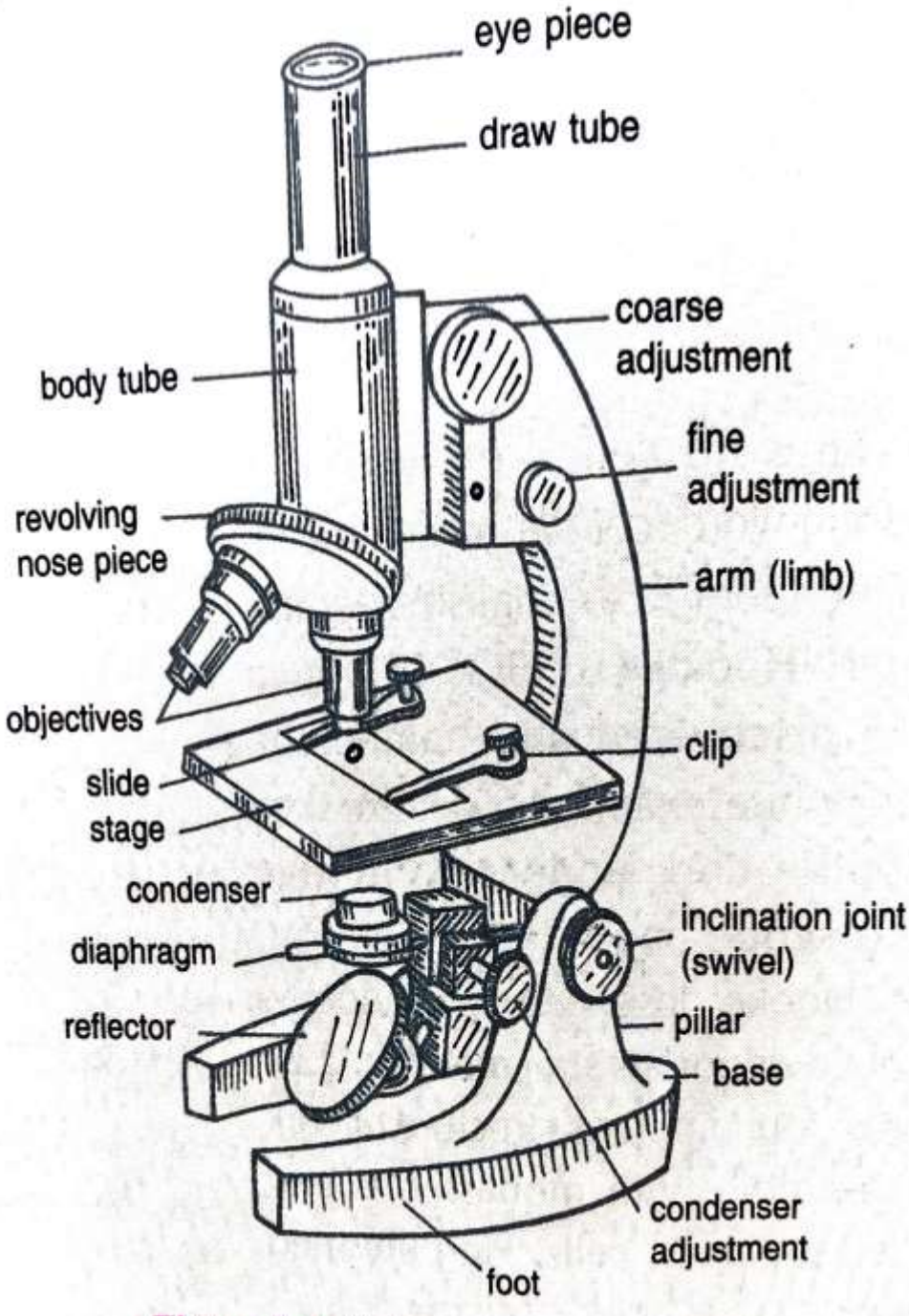
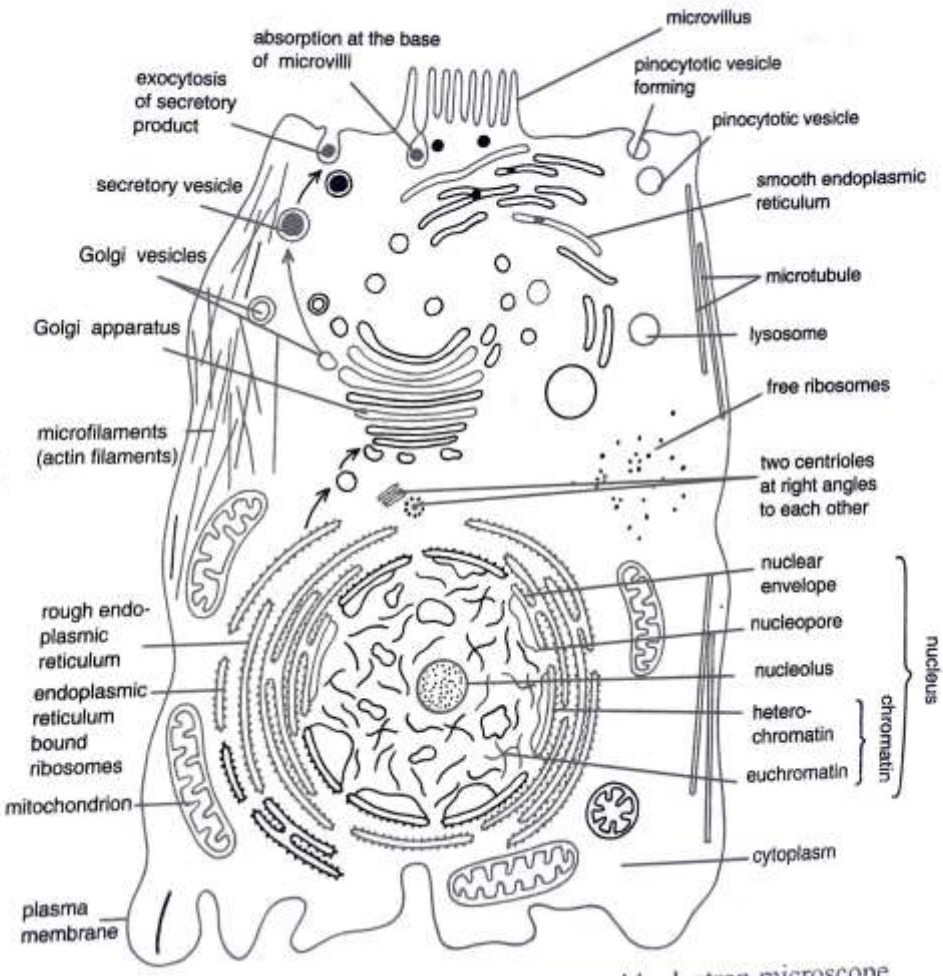
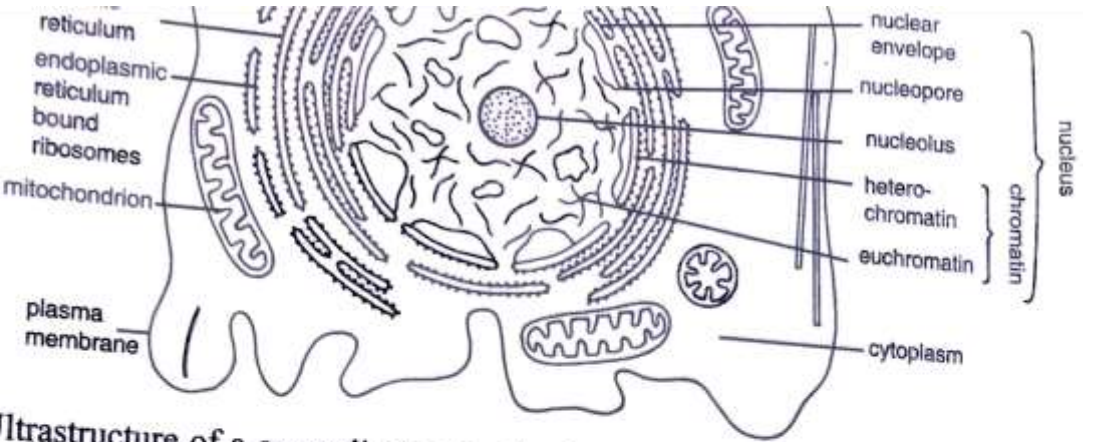


Figure 2.4. Light or Compound microscope.

r and large knob is meant for **coarse adjustments** and it The lower and small knob is used for **fine adjustments** gnification of an image can be increased or decreased X, 10 X, 15 X, etc.) accordingly.



...a generalised animal cell as seen with electron microscope.



igure 2.12. Ultrastructure of a generalised animal cell as seen with electron microscope.

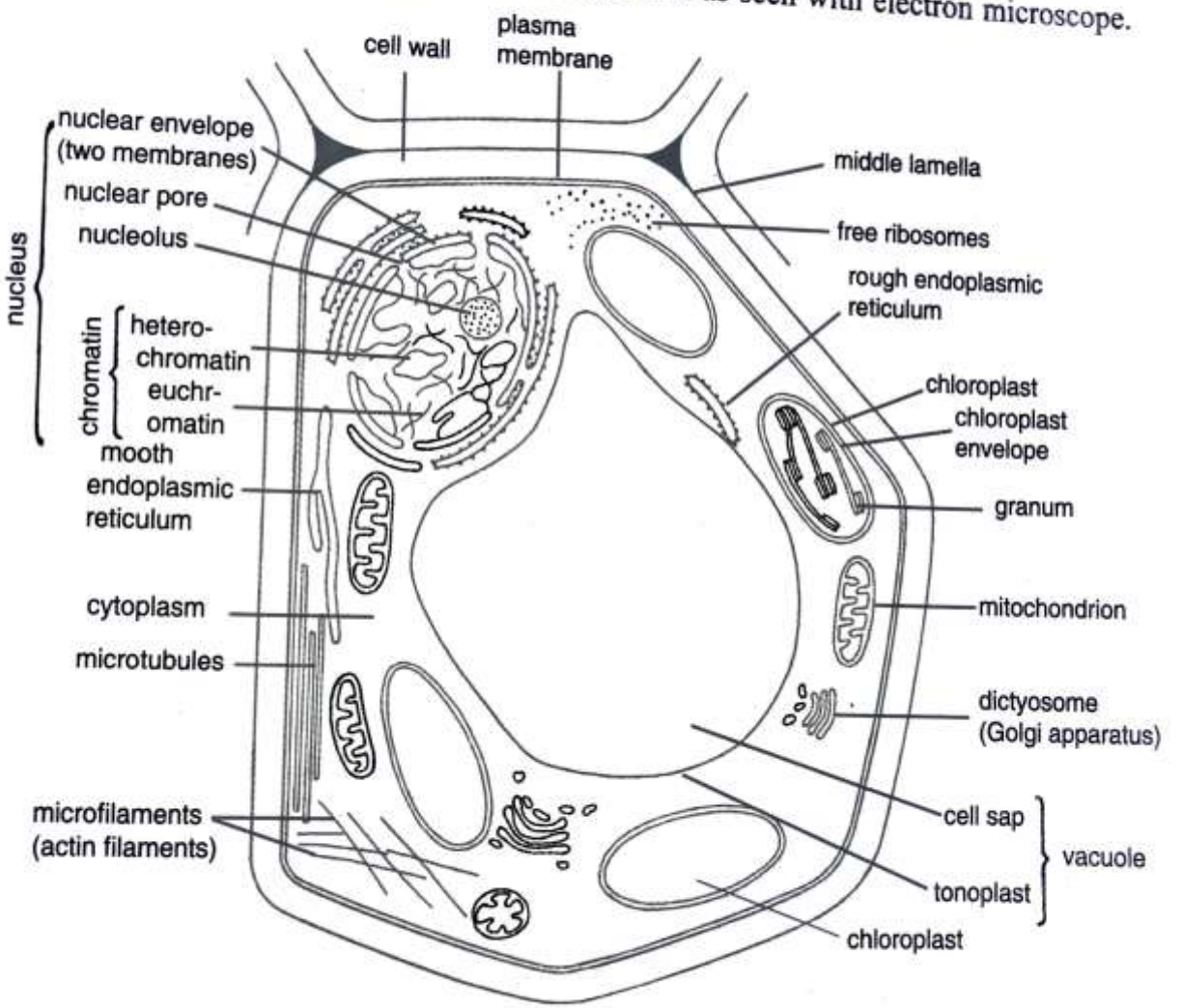


Figure 2.13. Ultrastructure of a generalised plant cell.

nsists of a set of membrane-bounded, fluid-filled vesic
sternae are usually stacked together (placed one above
us exists as an extensive network near the nucleus in
any freely distributed subunits of Golgi apparatus, ca
the stack, called *cis* face of Golgi. They are budded off
ed *trans* face of Golgi.

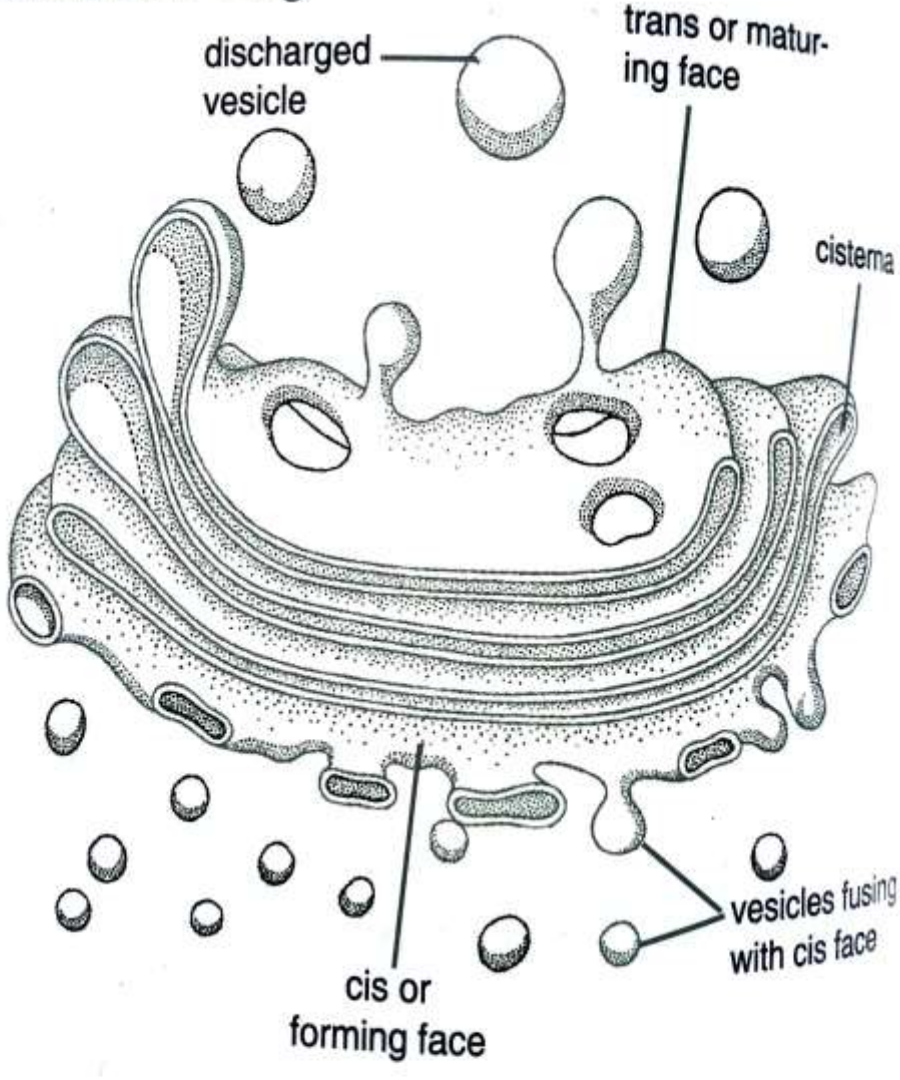
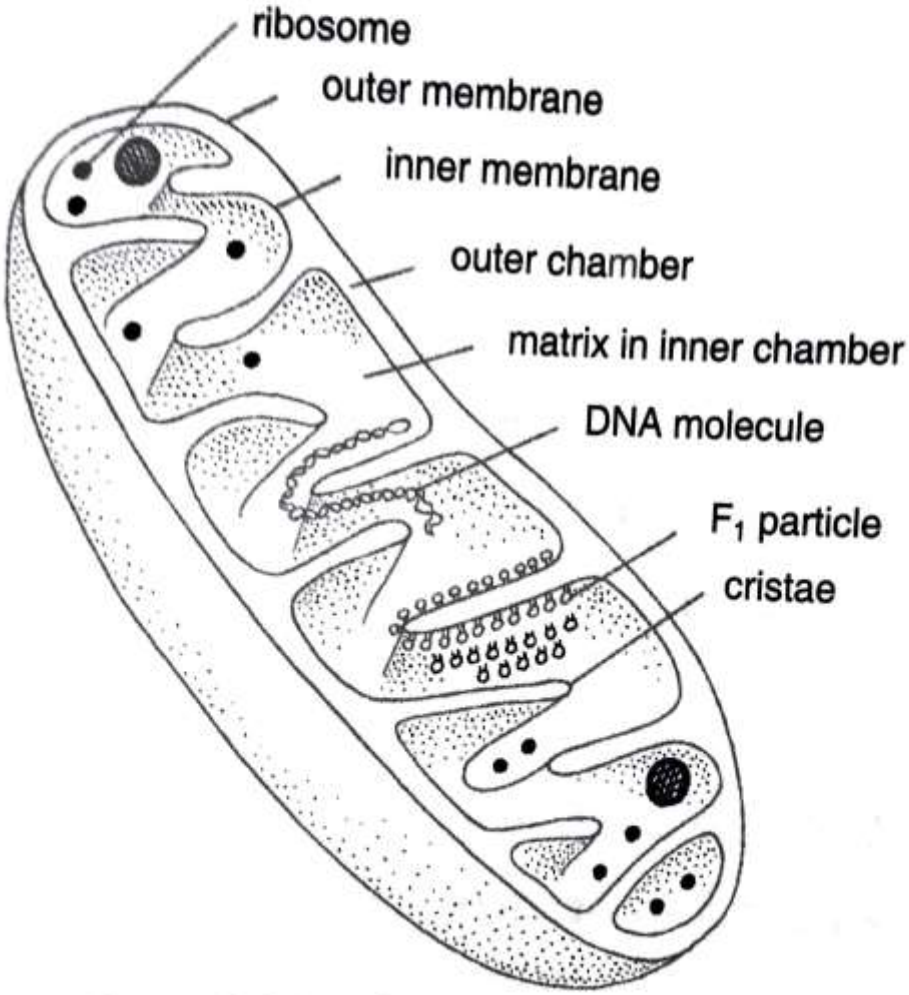


Figure 2.33. Golgi apparatus.

n algae, mature sperms and red blood cells of mamm

tilized by other body cells.

the **acrosome** of sperm cells digest the limiting e to enter the ovum and start the fertilization.



rrence. Chloroplasts are present in green algae
ophyll and they are involved in the photosynt
". Each chloroplast (Fig. 2.35) is bounded by two
regions : **1. Grana** are stacks of membrane-
iscoid sacs (called **thylakoids**) containing
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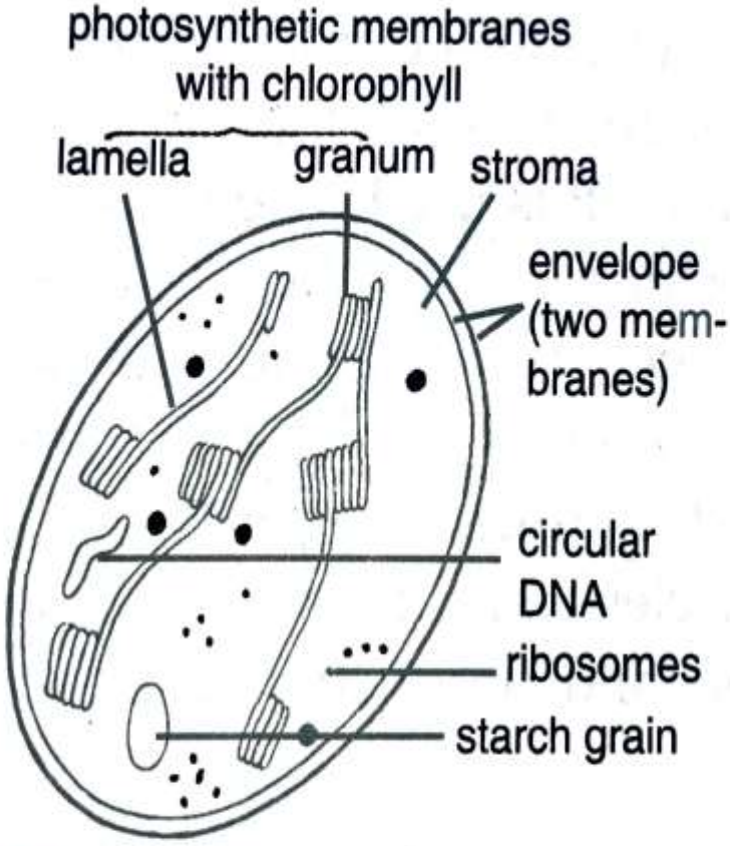
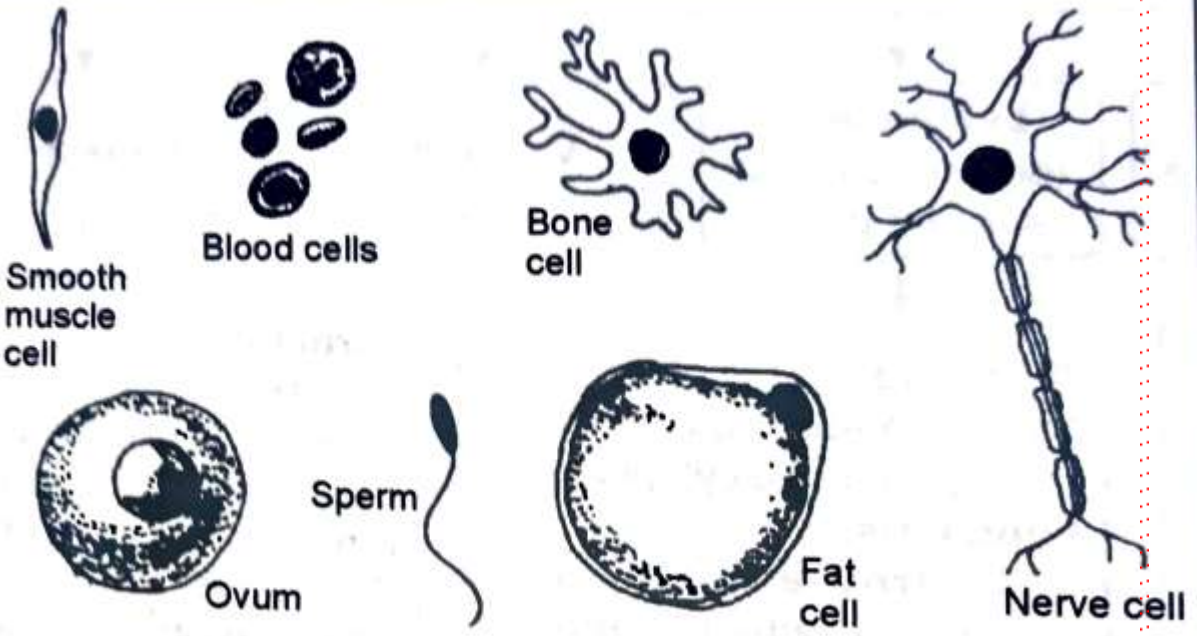


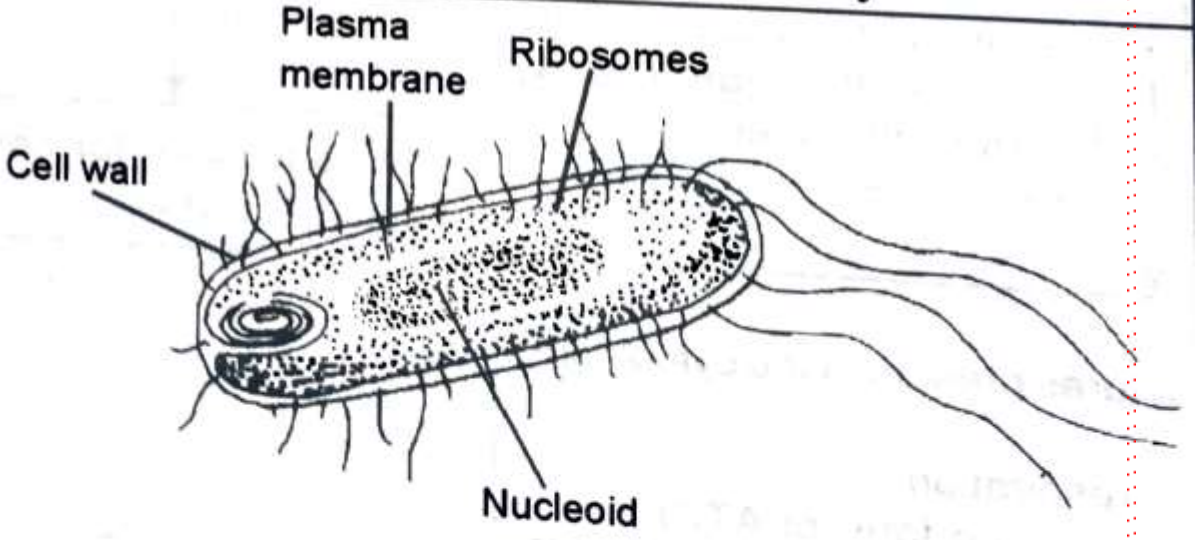
Figure 2.35. Internal structure of chloroplast.

1.



Various cells from the human body

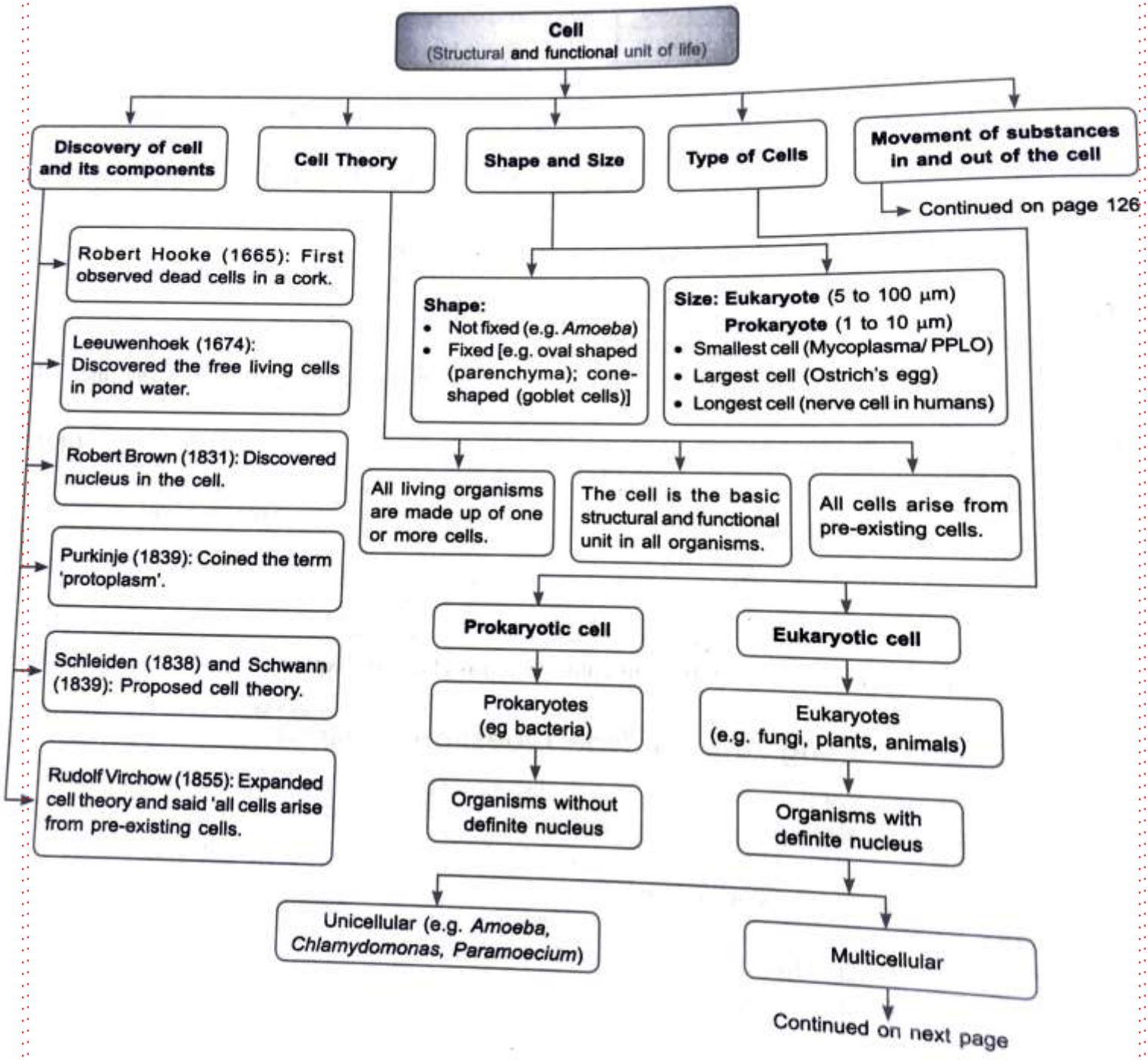
3.



Prokaryotic cell

5 THE FUNDAMENTAL UNIT OF LIFE

CHAPTER AT A GLANCE



Multicellular

Animals → **Animal cell**

Plants → **Plant cell**

Cell Membrane/Plasma Membrane:
- Madeup of proteins and lipids
- Selectively permeable membrane
- Gives shape to the cell
- Segregates cell content from surrounding.

Nucleus: Oval or spherical prominent structure.
- Nuclear membrane
- Nucleoplasm
- Chromatin material
- Nucleolus

Cytoplasm: Fluid content of the cell which occurs between plasma membrane and nuclear membrane. Membrane-bound cell organelles are present in the cytoplasm.

Cell Wall:
Rigid, non-living, freely permeable and mainly composed of cellulose.
- Provides structural strength
- Gives definite shape to the cell
- Protects from pathogen and mechanical injury

Plastids:
Major cell organelle in plants

Leucoplasts
- Colourless
- Performs the function of storage of starch, oil and protein granules.

Chromoplasts
- Coloured plastid
- Provide colour to fruits and flowers
- Green coloured plastid is called chloroplast ('kitchen of the cell'). It contains a green pigment called chlorophyll that helps in the process of photosynthesis. They have their own DNA and ribosomes.

Cell organelles

Endoplasmic Reticulum

Structure:
Large network of membrane-bound tubes and sheets extending from outer nuclear membrane to the plasma membrane.
Functions:
- Gives mechanical support to the cell.
- Serves as a channel for the transport of materials (especially proteins).

- **(RER) Rough Endoplasmic Reticulum:** Have ribosomes attached to the membrane
- **(SER) Smooth Endoplasmic Reticulum:** Ribosomes not attached to the membrane.

Golgi Apparatus

Structure:
A set of membrane-bound smooth, flattened cisternae, have small fluid-filled vesicles. They have their own DNA and ribosomes.
Function:
Storage, modification and packaging of products in vesicles.

Mitochondria (Power-house of the cells)

Structure:
Rod-shaped structures present in the cytoplasm.
Functions:
- Site of cellular respiration
- Provides energy (in the form of ATP).

Lysosomes (digestive bags/ suicidal bags)

Structure:
Membrane-bound vesicular structures in the cytoplasm.
Functions:
- Destroy any foreign material which enters the cell (like bacteria, virus).
- Removes dead and worn-out cell organelles by digesting them.

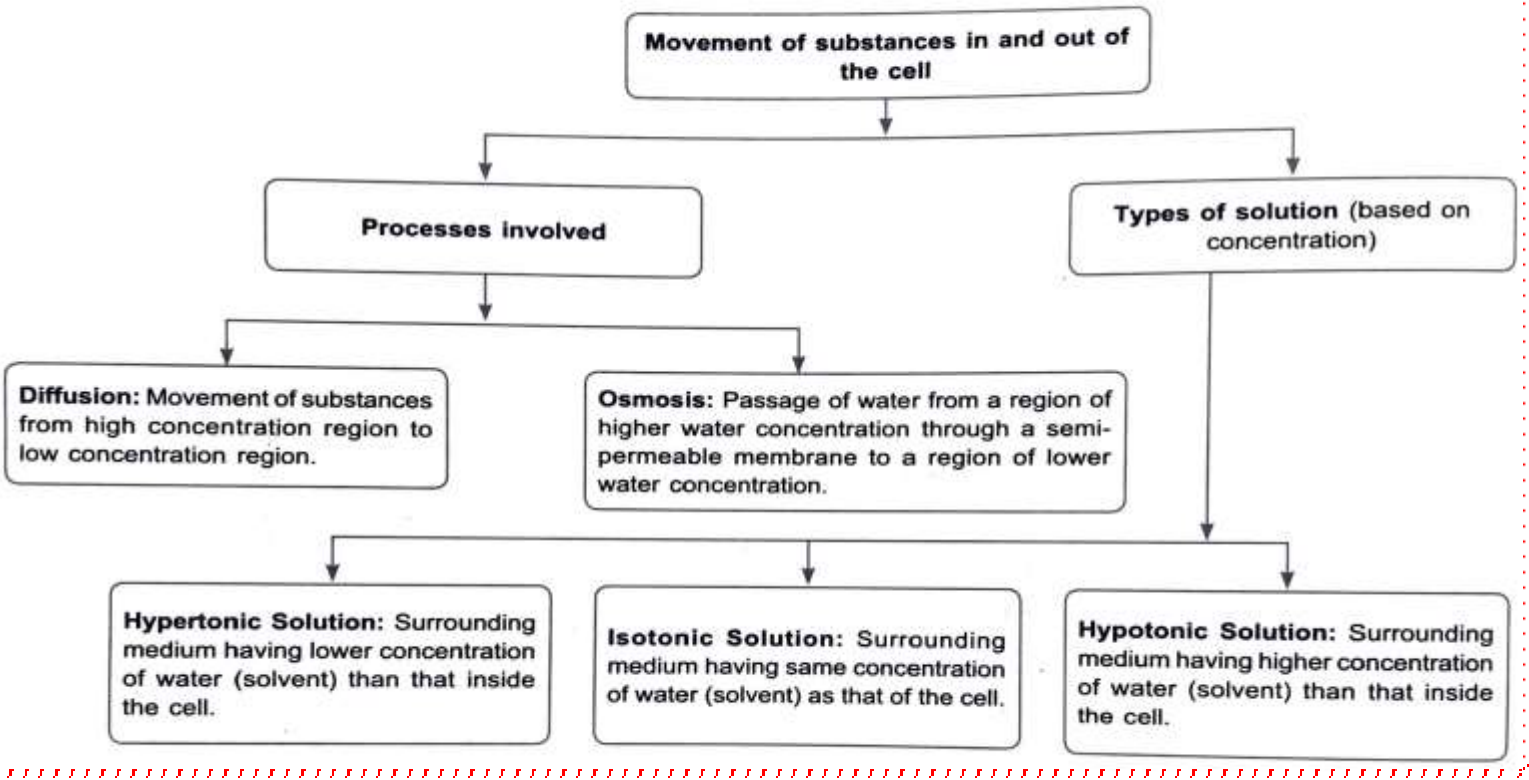
Vacuoles

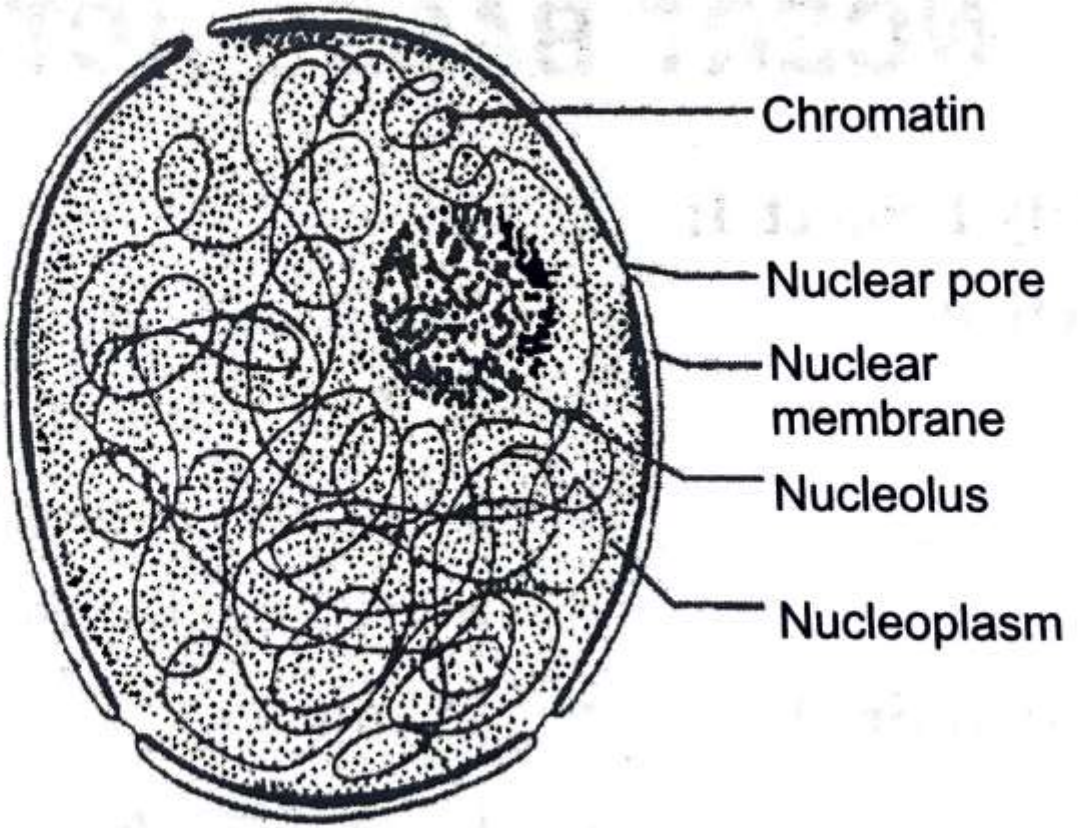
Storage sacs for solid or liquid content.

Ribosomes

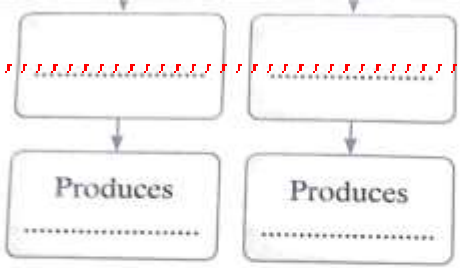
Structure:
Dense, spherical and granular particles which occur freely and also remain attached to ER.
Function:
Sites of protein synthesis.

Protoplasm (Physical basis of life):
Viscous, colourless, transparent material and a life giving substance of a cell.


Movement of substances in and out of the cell
Processes involved
Types of solution (based on concentration)
Diffusion: Movement of substances from high concentration region to low concentration region.
Osmosis: Passage of water from a region of higher water concentration through a semi-permeable membrane to a region of lower water concentration.
Hypertonic Solution: Surrounding medium having lower concentration of water (solvent) than that inside the cell.
Isotonic Solution: Surrounding medium having same concentration of water (solvent) as that of the cell.
Hypotonic Solution: Surrounding medium having higher concentration of water (solvent) than that inside the cell.



Structure of a Nucleus



NCERT INTEXT QUESTIONS

1. Who discovered cells and how?

Ans. Robert Hooke discovered cells for the first time in a cork slice with the help of a primitive microscope.

2. Why is the cell called the structural and functional unit of life?

Ans. Cell is called the structural and functional unit of life because all organisms are composed of one or more cells, and all vital functions of an organism occur within cells. Cells contain the hereditary information necessary for regulating cell functions and for transmitting information to the next generation of cells.

3. How do substances like CO_2 and water move in and out of the cell? Discuss.

Ans. Substances like CO_2 move in and out of the cell by a process called diffusion from a region of high concentration to a region where its concentration is low. The water moves in and out of the cell by the process of osmosis.

4. Why is the plasma membrane called a selectively permeable membrane?

Ans. The plasma membrane allows or permits the entry and exit of some materials in and out of the cell and prevents movement of some other materials through it. Hence, it is called a selectively permeable membrane.

5. Fill the gaps in the following table illustrating differences between prokaryotic and eukaryotic cells.

Prokaryotic cell	Eukaryotic cell
(*i*) Size : generally small (1-10 μm) 1μm = 10^{-6} m.	(*i*) Size : generally large (5-100 μm)
(*ii*) Nuclear region : _____ and known as _____	(*ii*) Nuclear region : well defined and surrounded by a nuclear membrane.
(*iii*) Chromosome : single	(*iii*) More than one chromosome.
(*iv*) Membrane-bound cell organelles absent.	(*iv*) _____

Ans. **Differences:**

Prokaryotic Cell	Eukaryotic Cell
(*i*) Size: generally small (1-10 μm). [1μm = 10^{-6} m]	(*i*) Size: generally large (5-100 μm).
(*ii*) Nuclear region: **poorly defined due to the absence of nuclear envelope** and known as **nucleoid.**	(*ii*) Nuclear region: well defined and surrounded by a nuclear membrane.
(*iii*) Chromosome: single.	(*iii*) More than one chromosome.
(*iv*) Membrane-bound cell organelles absent.	(*iv*) Membrane-bound cell organelles present.

6. Can you name the two organelles we have studied that contain their own genetic material?

Ans. Two organelle that contain their own genetic material are Mitochondria and Plastids.

7. If the organisation of a cell is destroyed due to some physical or chemical influence, what will happen?

Ans. If the organisation of a cell is destroyed due to some physical or chemical influence then the cell will not be able to perform some basic functions like respiration, nutrition, excretion, forming new proteins, etc. **[CBSE 2013]**

8. Why are lysosomes known as 'suicide bags'?

Ans. Lysosomes are the cell organelles involved in the digestion of any foreign material that enters the cell as they contain digestive enzymes. In case any body cell is dead or damaged, the lysosome bursts to release the digestive enzymes inorder to digest its own cell. Thus, these are known as 'suicide bags'.

9. Where are proteins synthesised inside the cell?

Ans. Proteins are synthesised in ribosomes.

NCERT EXERCISES

1. Make a comparison and write down ways in which plant cells are different from animal cells.

Ans.

Animal cells	Plant cells
(*i*) Animal cells are usually smaller in size.	(*i*) Plant cells are comparatively larger in size.
(*ii*) Enclosed by plasma membrane only. Cell wall is absent.	(*ii*) Plasma membrane of plant cells is surrounded by a thick cell wall.
(*iii*) Plastids are absent.	(*iii*) Plastids are present.
(*iv*) Cytoplasm consists largely of smaller vacuoles.	(*iv*) Central space of the cell is occupied by a large vacuole.
(*v*) Nucleus lies in the centre of the cell.	(*v*) Nucleus lies on one side of the cell.
(*vi*) Prominent and highly complex Golgi bodies present.	(*vi*) Golgi apparatus consists of several sub-units called dictyosomes.
(*vii*) Animal cells possess centrosome with two centrioles.	(*vii*) Plant cells lack centrioles.

2. How is a prokaryotic cell different from a eukaryotic cell?

Ans. Differences:

Prokaryotic cell	Eukaryotic cell
(*i*) Size of the cell is generally small (1-10 μm).	(*i*) Size of the cell is generally large (5-100 μm).
(*ii*) Nuclear region is poorly defined due to the absence of nuclear membrane and known as nucleoid.	(*ii*) Nuclear region is well-defined and surrounded by a nuclear membrane.
(*iii*) It contains single chromosome.	(*iii*) It contains more than one chromosome.
(*iv*) Nucleolus is absent.	(*iv*) Nucleolus is present.
(*v*) Membrane bound cell organelles absent.	(*v*) Cell organelles such as mitochondria, plastids, endoplasmic reticulum, golgi apparatus, lysosomes, peroxisomes, etc. are present.
(*vi*) Cell division takes place by fission or budding.	(*vi*) Cell division occurs by mitotic or meiotic cell division.
(*vii*) Centrioles absent.	(*vii*) Centrioles are present in animal cells.
(*viii*) Prokaryotic cells are found in bacteria, blue-green algae.	(*viii*) Eukaryotic cells are found in fungi, plant and animal cells.

3. What would happen if the plasma membrane ruptures or breaks down? **[HOTS]**

Ans. When the plasma membrane ruptures or breaks down, the contents of the cell come out, lysosomes may burst and digestion of cellular contents take place.

4. What would happen to the life of a cell if there was no Golgi apparatus? **[HOTS]**

Ans. If there was no Golgi apparatus in the cell, lysosomes would not be formed. There would not be any excretion, and foreign materials might accumulate in the cell.

5. Which organelle is known as the power house of the cell? Why?

Ans. Mitochondria are called the power house of the cell as they are sites for synthesis of energy rich ATP molecules by cellular respiration.

6. How does an *Amoeba* obtain its food?

Ans. *Amoeba* obtains its food by the process of endocytosis. In this process, the cell engulfs the food and other materials from its external environment due to the flexibility of the cell membrane.

7. What is osmosis?

Ans. It is the passage of solvent from a region of high concentration to a region of low concentration through a semipermeable membrane.

8. Carry out the following osmosis experiment:

Take four peeled potato halves and scoop each one out to make potato cups. One of these potato cups should be made from a boiled potato. Put each potato cup in a trough containing water. Now,

(*a*) Keep cup A empty.

(*b*) Put one teaspoon sugar in cup B.

(*c*) Put one teaspoon salt in cup C.

(*d*) Put one teaspoon sugar in the boiled potato cup D.

Keep these for two hours. Then observe the four potato cups and answer the following questions: **[HOTS]**

(*i*) Explain why water gathers in the hollowed portion of B and C.

(*ii*) Why is potato A necessary for this experiment?

(*iii*) Explain why water does not gather in the hollowed out portions of A and D.

es osmotic concentration which results in passage of water osmotically
gh the cells of potato into its cavity.
control experiment which indicates that the cavity of potato alone does

transporting various substances in and out of the cell.

83. What are the main functions of each of the following cell components? **[CBSE 2011]**

(a) Plasma membrane	**(b) Chromosomes**
(c) Lysosomes	**(d) Ribosomes**
(e) Nucleus	**(f) Mitochondria**
(g) Nucleolus	**(h) Cell wall**
(i) Chloroplast	**(j) Peroxisomes**

Ans. (a) **Plasma membrane:** It acts as a semipermeable membrane and allows only selective substances to pass through it.

(b) **Chromosomes:** They carry hereditary characters from parents to offsprings, i.e. from one generation to another.

(c) **Lysosomes:** They act as 'digestive bags' which fight against any infection inside the cell.

(d) **Ribosomes:** They help in protein synthesis.

(e) **Nucleus:** It controls all metabolic activities of the cell.

(f) **Mitochondria:** It is the 'power-house' of the cell which stores and releases energy in the form of ATP.

(g) **Nucleolus:** It acts as a platform for protein synthesis.

(h) **Cell wall:** It provides rigidity and protection to the cell.

(i) **Chloroplast:** It carries out photosynthesis in plants and synthesises food by trapping solar energy. So, they are called "kitchen of the cell".

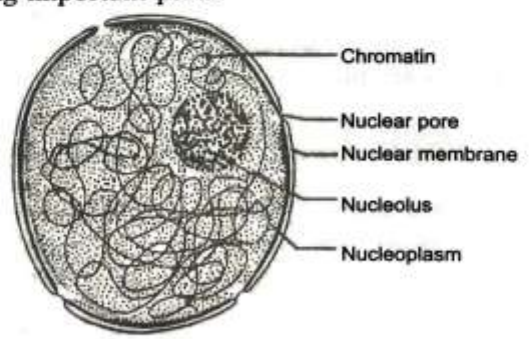
(j) **Peroxisomes:** It carries out oxidative reactions, which also remove the toxic substances.

84. Describe the structure of nucleus. **[CBSE 2011]**

OR

Explain in detail what do you know about the structure of nucleus. **[CBSE 2015]**

Ans. Robert Brown in 1831 discovered the nucleus in the cell. Nucleus is the largest cell structure. It is spherical or oval in shape and is a prominent structure. It is usually located in the centre of the cell. Nucleus has the following important parts:



Structure of a Nucleus

(i) **Nuclear membrane:** It is a double layered membrane, which separates nucleus from the cytoplasm.

(*ii*) **Nucleoplasm:** It is a homogeneous and granular dense fluid present inside the nucleus, in which chromatin and nucleolus are suspended.

(*iii*) **Chromatin material:** It consists of long, coiled network of thread-like structures. The chromatin material is made up of deoxyribonucleic acid (DNA) which is responsible for storing and transmitting the hereditary information from one generation to the other. It condenses into compact rod-like bodies called chromosomes at the time of cell division.

(*iv*) **Nucleolus:** It is more or less round structure found inside the nucleus. The nucleolus contains RNA (ribonucleic acid) and proteins. RNA is helpful in protein synthesis in the cytoplasm.

85. How many membranes are present in mitochondria? Give the characteristic features of these membranes. What is the advantage of such features? **[CBSE 2012]**

Ans. A mitochondrion contains outer and inner membranes. The two membranes have different properties.

Characteristic feature:

Outer membrane: The outer mitochondrial membrane, which encloses the entire organelle, is 60 to 75 angstrom thick. It contains large numbers of porins which allow smaller molecules to diffuse from one side of the membrane to the other. Disruption of the outer membrane permits proteins in the intermembrane space to leak into the cytosol, leading to certain cell death. The mitochondrial outer membrane can associate with the endoplasmic retuculum (ER) membrane.

Inner membrane: It has a very high protein-to-phospholipid ratio. The inner membrane is home to around 1/5 of the total protein in a mitochondrion. In adition, the inner membrane is rich in cardiolipin. It makes inner membrane impermeable. All ions and molecules require special membrane transporters to enter or exit the matrix.

Advantages: Mitochondria are shaped perfectly to maximize their productivity. The folding of the inner membrane increases the surface area inside the organelle. Since many of the chemical reactions heppen on the inner membrane, the increased surface area creates more space for reaction to occur.

86. Why is mitochondria called 'power-house of cell'? Give three similarities and one difference between mitochondria and plastid. **[CBSE 2010]**

Ans. Mitochondria is called the 'power-house of cell' because energy required by various chemical activities needed for life is released by mitochondria in the form of ATP. Body uses energy stored in ATP for making new chemical compounds and for mechanical work.

Three similarities between mitochondira and plastid are:

(*i*) both mitochondira and plastids have their own DNA and ribosomes.

(*ii*) external structure of mitochondria and plastids are same.

(*iii*) both mitochondria and plastids have more than one membrane layer.

One difference between mitochondria and plastids is that mitochondria are present in both plant and animal cell whereas plastids are present only in plant cell.

Value Based Questions

87. You are telling your 10 years old sister that cells were ...

and flagella of the cells.

73. Name the different living and non-living parts of a cell or cell organelles.

Ans. The different living and non-living cell organelles are:

Living parts of a cell	Non-living parts of a cell
(*a*) Plasma membrane	(*a*) Cell wall (plants only)
(*b*) Cytoplasm contains following cell organelles:	(*b*) Vacuoles
(*i*) Endoplasmic reticulum (ER): (Smooth ER and Rough ER)	
(*ii*) Mitochondria	
(*iii*) Golgi apparatus	
(*iv*) Ribosomes	
(*v*) Lysosomes	
(*vi*) Centrioles (animals only)	
(*vii*) Plastids (plants only)	
(*c*) Nucleus	(*c*) Granules (cell inclusions)

74. What will happen if we put an animal cell or a plant cell into a solution of sugar in water?

Ans. If we put an animal cell into a solution of sugar, one of the following three things may happen

(*i*) If the medium surrounding the cell has higher water concentration than the cell, then the will gain water by osmosis.

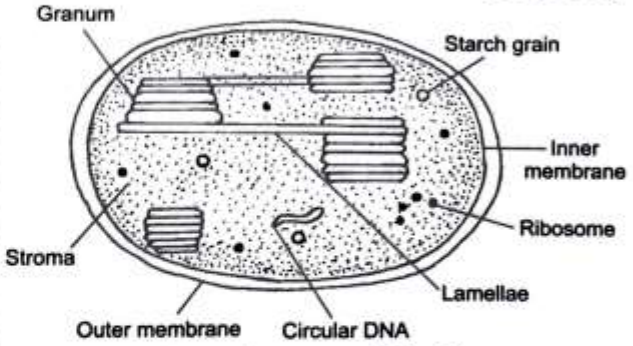
(*ii*) If the medium has exactly the same water concentration as the cell, there will be no movement of water across the cell membrane.

(*iii*) If the medium has a lower concentration of water than the cell, then the cell will loose water by osmosis.

75. Grass looks green, papaya appears yellow. Which cell organelle is responsible for this? **[CBSE 2016]**

Ans. Plastids

These are found in plant cells only. Plastids are the major cell organelles in plants. On the basis of pigments present in plastids, they are divided into two types (*i*) the colourless **leucoplasts** and (*ii*) the pigmented **chromoplasts**. The colourless **leucoplasts** store starch, oil and protein granules whereas the pigmented **chromoplasts** have different colours and can be of several types. The most important ones are those containing the pigment **chlorophyll**, known as **chloroplasts**, which is responsible for the preparation of food by photosynthesis. Other chromoplasts contain non-green pigments, which are responsible for the characteristic colours of fruits and flowers.



Internal structure of Plastids

76. Where are chromosomes located? What are they composed of? What is chromatin material and how does it change just before the cell divides? **[CBSE 2011, 2010]**

Ans. Chromosomes are located in the nucleus of plant and animal cells.
They are composed of DNA and protein. Chromatin material is entangled mass of thread-like structures. The chromatin material gets organised into chromosomes just before the cell divides.

77. What does DNA molecule contain? Name the functional segment of DNA. In which form is the DNA present in a cell when the cell is not dividing? **[CBSE 2010]**

Ans. DNA molecules contain the information necessary for construction and organisation of cells. Functional segments of DNA are called genes. In a cell which is not dividing, DNA is present as a part of chromatin material.

78. Differentiate between diffusion and osmosis. **[CBSE 2013]**

Ans.

Diffusion	Osmosis
(*i*) Diffusion takes place in any medium.	(*i*) Osmosis occurs only in liquid medium.
(*ii*) It is the movement of a substance from the area of its higher concentration to the area of its lower concentration.	(*ii*) It is the movement of water from the area of its higher water concentration to the area of lower concentration.
(*iii*) The diffusing molecules may be solids, liquids or gases.	(*iii*) It involves movement of solvent molecules only.
(*iv*) It does not require a semi-permeable membrane.	(*iv*) It requires a semi-permeable membrane.

79. Name:
(*a*) An organelle which has its own genetic material
(*b*) An organelle rich in digestive enzymes
(*c*) Nucleic acid present in nucleus of cell

Ans. (*a*) Mitochondria
(*b*) Lysosomes
(*c*) DNA (Deoxyribonucleic acid).

M.R.V. Model School, Sec-13, Dwarka

English Holiday HW

Class IX

1. Create a magazine in which you will inclu
   a). Cover page
   b) a table of contents
   c). Article - Social Distancing
   d) Poster - Awareness ab
      Social Distancing
   e) Jokes (at least five)
   f) Puzzles
   g) Quizzes
   h) Study tips during Qua
   i) productive things to do while at home or in
   j) a story in a comic form. draw pictures a
      captions underneath to describe what is happ

2. Write an essay in about 150 words -
   "The best strategy in the Quarantine to redu
   spread of Covid-19"

3. Write 30 idioms in your English notebook
   their meanings and sentences.

4. Pick two words daily from your dictionary
   their meanings and sentences in your notebo

5. Write summary and keywords (3-11 chapters -
   -ntary reader (Moments) in your notebook.

Date / /
Page No.

ग्रीष्मकालीन गृहकार्य

कक्षा :- नवीं (2020-21)
विषय :- हिंदी

1) अहंकार सदैव ही विनाश का कारण बनता है। अत: अहंकार विषय पर आधारित, विषकहानी, कविता संस्मरण लिखें। अंत में किसी संत कवि के दोहे द्वारा समापन कर उसमें प्राप्त नैतिक शिक्षा भी लिखें। (Scrapfile)

2) अनुच्छेद लेखन :- (P.C कॉपी)
* बचपन से दूर होते बच्चे
* प्रदूषण
* मेरे सपनों का भारत
* सत्संगति

3) एक से 30 अप्रैल तक की कोरोना की खबरों को अखबार में से एकत्रित कर उसे स्क्रेप फाइल में चिपकाएं। और जितने लाकडाउन सरकार द्वारा अब तक लगाए गए है उनमे कितनी पाबंधी, कितनी छूट मिली उसका पुरा ब्योरा तैयार करें।
(In Scrapfile).

4) पाठ्यक्रम - i) संचयन पाठ - 1, 2, 5, 6 कहानियाँ पढ़िए और सार अपने शब्दों में P.C कॉपी में लिखें।
ii) स्पर्श में पढ़ाए गए अब तक के सभी विषयों को पुन: पढ़े और प्रश्न उत्तर याद करें।
iii) रोज़ कम से कम 10 पर्यायवाची, विलोम, मुहावरे पढ़े, समझे और P.C कॉपी में रोज लिखें। मुहावरों के अर्थ और वाक्य में प्रयोग करें।

"सुरक्षा जीवन का अर्थ है,
सुरक्षा के बिना सब व्यर्थ है"
सुरक्षित रहिये
स्वस्थ रहिये ॥