

# **DELHI PUBLIC SCHOOL JAMMU**



## **QUESTION BANK**

**CLASS:X**

**SUBJECT: Science**

**SESSION: 2018-19**

## SYLLABUS FOR HALF YEARLY

### CLASS:X

Sub: PHYSICS

Chapter 12: Electricity.

Chapter 13: Magnetic Effects of Electric Current.

Chapter 14: Source of Energy.

### CHEMISTRY

Chapter1: Chemical Reactions and Equations

Chapter2: Acids,Bases and Salts

Chapter3: Metals and Non- Metals

### BIOLOGY

Chapter6: Life Process.

Chapter7: Control and Co-ordination.

Chapter8: How Do Organisms Reproduce .

## Question Bank-I

Class: 10<sup>th</sup>

Subject: Physics

Chapters Covered:

### 1. Electricity and its effect.

#### 1 mark questions:

Q1: Why the bulb gets fused, if it operated at a higher potential than its power rating?

Ans: Because more heat is produced when it is operated at higher potential as heat produced is  $H = \frac{V^2 t}{R}$ .

Q2: There are two bulbs marked (a) 60W, 220V and (b) 100W, 220V. Which one of the two has a higher resistance?

Ans: As power,  $P = \frac{V^2}{R}$  or  $P \propto \frac{1}{R}$  or  $R \propto \frac{1}{P}$ , so 60W bulb has more power.

Q3: How does the resistivity of a conductor changes when its length is tripled by stretching it?

Ans: No effect as resistivity does not depends upon the dimensions of a conductor.

Q4: Why is magnanin used for making standard resistors?

Ans: It is a alloy hence have low temperature coefficient of resistance.

Q5: Two wire of area of cross-section A and 2A, which one has greater resistance?

Ans: Smaller area has greater resistance as  $R \propto \frac{1}{Area}$

#### 2 marks questions:

Q1: Define charge.

(b)When a particle of charge  $10\mu C$  is brought from infinity to a point in the electric field, 10mJ work is done by the external forces. What is the potential at that point?

Ans: (a) It is the intrinsic property of matter to produce electric and magnetic effect.

(b)Using,  $V_A - V_B = \frac{W}{q}$  or  $V - V_\infty = \frac{W}{q}$  or  $V = \frac{W}{q} = \frac{10 \times 10^{-3}}{10 \times 10^{-6}} = 10^3 = 1000V$

Q2: (a) Define 1 watt.

(b)Compare the power used in the  $2\Omega$  resistor in each of the following circuits. (I) a 6V battery in series with  $1\Omega$  and  $2\Omega$  resistor and (II) a 4V battery in parallel with  $12\Omega$  and  $2\Omega$  resistors.

Ans: (a) 1 watt: 1 watt is the power consumed or delivered when 1 joule of work is done per second.

(b) $I = \frac{6}{1+2} = 2A$  and as the same current flows in series so power used in 2 ohm resistor is,  $P = I^2 R = 2^2 \times 2 = 8W$ .

In parallel power potential remains same equal to 4V, so  $P = \frac{V^2}{R} = \frac{4^2}{2} = \frac{16}{2} = 8W$ .

Hence, comparison between the power used in both cases  $= \frac{P_s}{P_p} = \frac{8}{8} = 1:1$

Q3: Keeping the potential difference constant, the resistance of a circuit is doubled. By what factor does the current change in the circuit?

Ans:  $V = IR$  from Ohm's law

For constant potential difference,  $IR = \text{constant}$

$$\Rightarrow I_1 R_1 = I_2 R_2$$

$$\frac{I_2}{I_1} = \frac{R_1}{R_2} = \frac{R}{2R} = \frac{1}{2}$$

$$\text{Or } I_2 = \frac{1}{2} I_1$$

Q4: What are the factors affecting resistance?

Ans: Resistance of given conductor depends upon the following factors:

(a)  $R \propto l$  i.e. resistance is directly proportional to the length of the conductor, it means greater the length, greater the resistance offered by the conductor.

(b)  $R \propto \frac{1}{A}$  i.e. resistance is inversely proportional to the area of cross section of the conductor, it means greater the area of cross-section, smaller the resistance offered by the conductor. Due to this reason thin wire has higher resistance while thick wires have lower resistance.

Q5: Define (a) 1kWh (b) Power. Also give mathematical relation and SI unit of electric power.

Ans: 1kWh:- One kilowatt hour is the amount of energy consumed or dissipated when an electric appliance of one kilowatt rating is used for one hour.

1 unit=1kWh =  $3.6 \times 10^6$  J

Electric power:- It is defined as the electric work done per second.

Mathematically,

$$P = W/t = VI = I^2 R = \frac{V^2}{R}$$

Its SI unit is watt (W) and other unit is  $\text{Js}^{-1}$ .

### 3 marks questions:

Q1: Explain the heating effect of current and also give its applications.

Ans: As we know that the conductors in the circuit offer some resistance so we use joules heating effect to calculate the amount of work done in carrying charge  $q$  through a potential difference  $V$ .

Mathematically,

$$W = V(It)$$

And this is the energy spent in overcoming the resistance offered by the conductor and whole of this energy is converted into heat.

Therefore,

$$\text{Heat produced } H = W = VIt \text{ joules}$$

But acc to Ohms law,  $V = IR$

$$\Rightarrow H = (IR)It = I^2 R t \text{ joules}$$

Applications of heating effects of current:-

- (1) It is due to heating effect we use heating coils or heating elements made of high resistance wires such as nichrome in various electrical appliances like water heaters, electric iron, geysers and toasters etc.
- (2) It is due to heating effect we use bulbs for lightening using tungsten as heating filament.
- (3) It is due to heating effect we use fuse wires made of alloy of tin and lead to prevent the damage of costlier electric appliances.

Q2: Define resistance. Also give its SI unit, properties and cause of resistance.

Ans:

**Resistance:-** It is the property of a conductor by virtue of which it opposes the flow of electric current through it is called resistance.

Mathematically,

$R = \rho \frac{l}{A}$ , where  $\rho$  the specific resistance or resistivity of the conductor is,  $l$  is the length of the conductor,  $A$  is the area of cross-section of the conductor.

### Properties of resistance:

1. It is a scalar physical quantity and acts as passive component.
2. Its SI unit is ohm and denoted by the Greek letter  $\Omega$  (omega)

**Cause:-** The basic cause of resistance is collision between electrons and with positive ions present in the metallic conductor by stop and go process.

Q3: Give difference between Ammeter and Voltmeter.

Ans: Difference between ammeter and voltmeter are:

	Ammeter	Voltmeter
1	It is a device which measures current in a circuit.	It is a device which measures potential difference between two points in a circuit.
2	It is connected in series in a circuit.	It is connected in parallel across the two points in the circuit.
3	It is a low resistance device.	It is a high resistance device.

Q4: An electric geyser rated 1500W, 250V is connected to a 250V main line. Calculate (a) the electric current drawn by it. (b) energy consumed by it in 50 hours. (c) cost of energy consumed if each unit costs Rs 6/-.

Ans: (a)  $I = P/V = 1500/250 = 6A$

(b) Energy consumed 'E' =  $Pt = 1500 \times 50 = 75000Wh = 75kWh$

(c) Cost of 75 unit =  $75 \times 6 = Rs\ 450/-$

Q5: (a) What are the characteristic features of a heating element?

(b) Two lamps one rated 100w at 220V and the other 60W at 220V are connected in parallel to a 220V supply. What current is drawn from the supply line?

Ans: (a) The characteristics of a heating element are:

1. It should have moderate resistivity.
2. It should have high melting point and should not oxidize at higher temperature.

(b) As  $P = VI$ , so

For 1<sup>st</sup> bulb,

$$I_1 = \frac{P}{V} = \frac{100}{220} = 0.45A \text{ and}$$

For 2<sup>nd</sup> bulb,

$$I_2 = \frac{P}{V} = \frac{60}{220} = 0.27A$$

$$I = I_1 + I_2 = .45 + .27 = .72A$$

### 5 marks questions:

Q1: Q1: State and prove Ohm's law.

Ans:

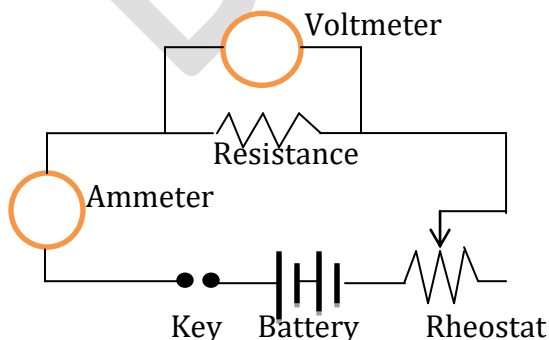
**Ohm's law:-** It states that at constant temperature (or keeping physical conditions constant like temperature, pressure and heat), the current flowing through a conductor is directly proportional to the potential difference across the conductor.

Mathematically,  $I \propto V$  (when temperature is constant)

Or  $I = \frac{V}{R} \Rightarrow V = IR$ , where R is the resistance of the conductor.

**Proof or verification:** To prove the Ohms law experimentally, first we make the following connections. In the given circuit diagram, we connect Battery, key, ammeter, resistance, Rheostat in series and then connect voltmeter in parallel with resistance.

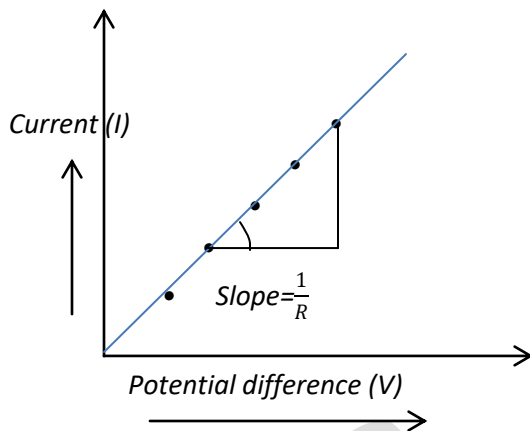
**Circuit Diagram:**



First we close the key so that current flows in the circuit and after that adjust the rheostat so that minimum current flows in the circuit.

After setting minimum current increase the value of current by adjusting Rheostat and measure current shown by ammeter and also measure corresponding value of potential difference from voltmeter. Similar way, take five to six values of current and potential difference and draw a graph between potential V (taken along x-axis) and current I (taken along y-axis).

Ammeter reading (A)	Voltmeter reading (V)	Resistance $R = \frac{V}{I}$
$I_1$	$V_1$	$R_1 = \frac{V_1}{I_1}$
$I_2$	$V_2$	$R_2 = \frac{V_2}{I_2}$
$I_3$	$V_3$	$R_3 = \frac{V_3}{I_3}$
$I_4$	$V_4$	$R_4 = \frac{V_4}{I_4}$
$I_5$	$V_5$	$R_5 = \frac{V_5}{I_5}$



We observed a straight line graph between potential V and current I.

This straight line graph shows that the ratio  $\frac{V}{I}$  is constant i.e.  $R_1 = R_2 = R_3 = R_4 = R_5 = R$ , hence R is constant for a given conductor and this indicates that the current flowing through the resistor is directly proportional to the potential difference.

This is what Ohm's law and verified experimentally.

Also from this graph we can easily find the resistance from the slope, i.e.

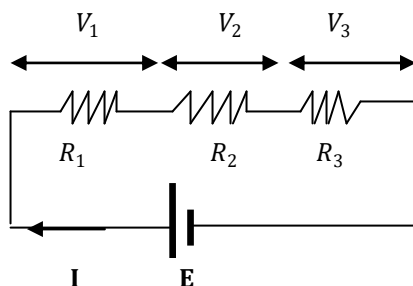
Resistance  $R = \frac{1}{\text{Slope of straight line}}$ , Here if we plot graph between current I and voltage V then,

Resistance  $R = \text{slope of straight line}$ .

**Conclusion of Ohms law** is that if the potential difference across a conductor is doubled, then current also gets doubled.

Q2: Calculate equivalent resistance in (a) series and (b) parallel combination.

Ans: Resistance in series: - Two or more resistances are said to be in series if same current passes through them, when some potential difference is applied across the combination and we proceed along same path.



Since by Ohms law,

$$V = IR$$

and  $E = V_1 + V_2 + V_3$  -----1, where  $E = IR_s$

$$\Rightarrow V_1 = IR_1, V_2 = IR_2 \text{ and } V_3 = IR_3$$

now substituting in 1<sup>st</sup> we have

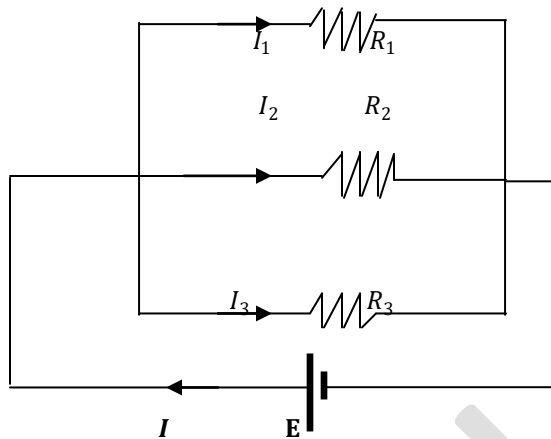
$$IR_s = IR_1 + IR_2 + IR_3$$

$$\Rightarrow I(R_s) = I(R_1 + R_2 + R_3)$$

$$\Rightarrow R_s = (R_1 + R_2 + R_3)$$

Resistance in parallel combination: -

Two or more resistances are said to be in parallel, if the potential difference across each resistance is same but different currents and we proceed along different paths.



Since by Ohms law  $V = IR$  and

$$I = I_1 + I_2 + I_3 \text{ -----1, where } I = \frac{E}{R_p} \text{ and}$$

$I_1 = \frac{E}{R_1}$ ,  $I_2 = \frac{E}{R_2}$  and  $I_3 = \frac{E}{R_3}$ , now substituting all in equation 1<sup>st</sup>, we have

$$\frac{E}{R_p} = \frac{E}{R_1} + \frac{E}{R_2} + \frac{E}{R_3} = E \left( \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \right)$$

$$\Rightarrow \frac{1}{R_p} = \left( \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \right)$$

## Question Bank-I

Class: 10<sup>th</sup>

Subject: Physics

Chapters Covered: 1. Magnetic effects of electric current. 2. Sources of energy.

### 1. Magnetic effects of electric current

#### 1 mark questions:

Q1: Name the device which is used to draw magnetic field lines.

Ans: Magnetic compass.

Q2: What will be the polarity of ends of solenoid if the current appears to flow anticlockwise at one end and clockwise in another end?

Ans: For anticlockwise current north pole develops and for clockwise current south pole develops.

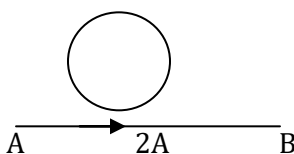
Q3: What is the direction of magnetic field lines inside and outside a bar magnet?

Ans: Inside direction is from south to north and outside direction is from north to south side.

Q4: Name the device used to prevent damage to the electrical appliances and the domestic circuits due to overloading or short-circuiting.

Ans: Electric fuse or MCB.

Q5: A steady current of 2A is flowing through a conductor AB. Will the current be induced in the circular wire of 0.5m? Give reason.



Ans: No, because in a steady current wire AB produces constant magnetic field and for induced current changing magnetic field is needed.

#### 2 marks questions:

Q1: Define magnetic field. Why two magnetic field lines cannot intersect each other?

Ans: It is defined as the region or space around a magnet where force of attraction or repulsion is experienced by another magnet.

Two magnetic field lines cannot intersect each other as it represents two directions at the same point, which is not possible to have two directions.

Q2: How does the strength of the magnetic field in solenoid increased?

Ans: It is increased by:

1. By increasing the current 'I' and soft iron core inside the solenoid.
2. By increasing the number of turns of coil, n.

Q3: Define short circuiting and overloading.

Ans: A sudden flow of very large current due to direct contact of a live and a neutral wire is called short-circuiting.

The overheating of electrical wiring in any circuit due to the flow of large current through it is called overloading.

Q4: Define electric fuse. How does a fuse work?

Ans: A fuse is a piece of thin wire of material having high resistance and low melting point.

Generally tin-lead alloy fuses are made but in urban area MCB (Miniature circuit breakers) are used.

In the circuit fuse is connected in series with the live wire. When the current exceeds the limiting value due to short-circuiting and overloading then it melts and breaks the circuit.

Q5: Define earthing. Why it is done?

Ans: It is defined as the method of connecting the metallic body of an electrical appliance to the earth by conducting wires during short-circuiting and overloading to avoid fires and electrical shocks.



It is done to avoid fire accidents and to prevent electric shocks.

### 3 marks questions:

Q1: What are the factors which govern the force experienced by a current carrying conductor placed in a Uniform magnetic field depends?

Ans: The factors are:

1. Strength of magnetic field,  $B$  due to magnet north and south poles.
2. Strength of the current flowing through the conductor,  $I$ .
3. Length of the conductor,  $l$ .

Q2: (a) What is short circuiting?

(b) What is overloading? How can you avoid overloading?

Ans: (a) Short circuiting means when live wire and the neutral wires come in contact with each other. Due to this resistance of the circuit becomes very small and huge amount of current flows through the circuit which in turn produces more heat which can cause fire.

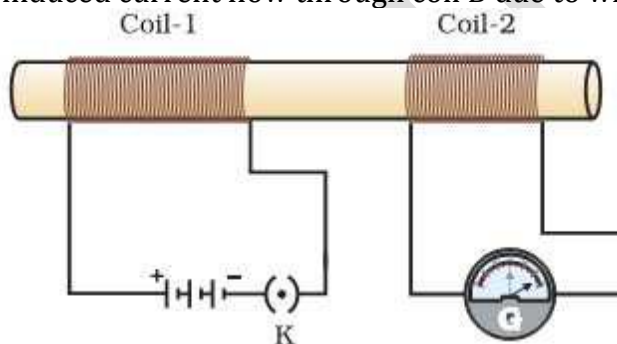
(b) Overloading means large amount of current flows in the circuit. It can happen when many electrical appliances of high power ratings are connected in a single socket. It can be avoided by the following methods

- (i) Not use too many appliance in a single socket
- (ii) To apply preventive methods of short circuiting.

Q3: Define electromagnetic induction. Write two ways to induce current in a coil?

Ans: It is the phenomenon of producing induced current or emf whenever magnetic lines of forces linked with coil changes.

When current in coil A is changed, magnetic flux sets up around coil A due to which some magnetic field set up in the coil B thus some induced current flow through coil B due to which galvanometer deflects.



Two ways to induce current in a coil are;

- (i) By moving a bar magnet toward or away from the coil.
- (ii) By placing a coil near another coil connected across a battery.

Q4: What is the principle of electric motor? State the function of (a) split ring (b) field magnet used in electric motor.

Ans: Electric motor works on the principle that a current carrying conductor placed perpendicular to a magnetic field experiences a force.

(i) Split ring – It reverses the dissection of current in the armature and thus direction of force is also reserved. As a result dc motor continues to rotate in same direction.

(ii) Field magnet – It provided strong magnetic field.

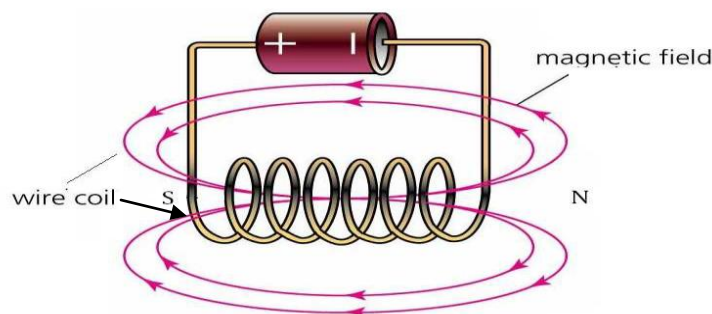
Q5: Define solenoid. How north and south poles are formed when current flows through solenoid?

Ans: A solenoid is a coil of many turns of insulated copper wire closely wound in the shape of a ring. When current is allowed to flow through a wire it appears to flow clockwise at one end and anticlockwise at another end.

So,

North pole is formed due to anticlockwise flow of current through a coil.

South pole is formed due to clockwise flow of current through a coil.



## 5 marks Questions:

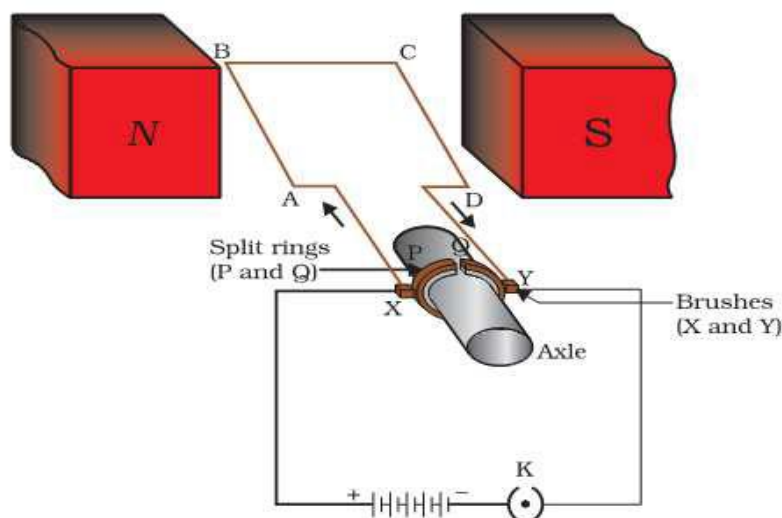
Q1: List in tabular form difference between an electric motor and a generator.

Ans: The differences are:

	Motor	Generator
1	It is a device which converts electric energy into mechanical energy	It is a device which converts mechanical energy into electrical energy.
2	It works on the principle of magnetic effects of current, i.e, when a current carrying conductor is placed normal to the direction of magnetic field, it experiences a force.	It works on the principle of electromagnetic induction, i.e, current can be induced in a coil by rotating it in a magnetic field.
3	The direction of force can be found by using Fleming's Left hand rule.	The direction of induced current can be found by using Fleming's Right hand rule.
4	Armature is rotated in the magnetic field by supplying electric current to get mechanical work.	Armature is rotated in the magnetic field by some external mechanical force to produce electric current.
5	Split rings is used as commutator to reverse the direction of flow of current and direction of force acting on the arms of the coil after every half rotation, which makes the coil to continue rotate in the same direction.	The slip rings conduct the alternating current or split ring conduct the direct current to the external circuit through the carbon brushes.

Q2: Explain the principle, construction and working of an electric motor with a help of labelled diagram?

Ans:



Principle – it is based on the principle that a current carrying conductor placed

perpendicular to the magnetic field experiences a force.

Construction-

(1) Armature or coil- It consists of an insulated copper wire wound on a soft iron core.

(2) Strong field magnet- two pole pieces of a strong magnet provide a strong magnetic field.

(3) Split ring- it consists of two halves ( $R_1$  and  $R_2$ ) of a metallic ring which reverses the direction of the current in a coil.

(4) Brushes- two carbon brushes touch the commutator (split ring).

(5) Battery – a battery is connected across the carbon brushes.

## 2. Sources of energy

### 1. mark questions:

Q1: Why is CNG considered as environmental friendly fuel?

Ans: Because it will not produce any harmful gases on burning.

Q2: Name the gases responsible for global warming.

Ans: Carbon-dioxide and Methane.

Q3: Name the substance whose vapours are used to run the turbines of generator of OTE plant.

Ans: Ammonia.

Q4: List two non-conventional sources of energy.

Ans: Geothermal, solar and biomass.

Q5: Why is a solar cooker painted black from outside and inside?

Ans: Because a black painted surface absorbs more heat/heat radiations as compared to other coloured surfaces.

### 2. marks questions:

Q1: Hydro power is a renewable source of energy. Justify.

Ans: Hydro power is a renewable source of energy because it is derived from the renewable source of energy i.e. Sun.

Q2: What are the advantages of nuclear energy?

Ans: Advantages of nuclear energy-

(i) A small quantity of fuel provides a large amount of energy.

(ii) The nuclear fuel once inserted in a nuclear power plant gives a large amount of energy for a longer period of time.

Q3: Write two qualities of an ideal source of energy?

Ans: The two qualities of an ideal source of energy are-

(i) It does not cause environmental pollution and is easily available.

(ii) Economical and should have good calorific value.

Q4: Why are many thermal power plants set up near coal or oil fields?

Ans: The thermal power plants are usually set up near coal or oil fields so that the fuel is easily available and the problem of air pollution while transporting the fuel may be minimized.

### 3. marks questions:

Q1: What are the limitations of extracting energy from

(a) the wind

(b) waves

(c) tides.

Ans: (a) Wind energy is not sufficient to operate heavy machines and moreover it is limited to a certain place.

(b) Energy of the waves can be extracted only if strong wind blows all the time across the sea.

(c) Tidal power plant can extract the tidal energy from the water levels of high tide and low tide is very large.

Q2: Name three forms in which energy from ocean is made available for use. What are OTEC power plants? How do they operate?

Ans: (i) Tidal energy

(ii) Ocean waves energy

(iii) Ocean thermal energy

OTEC power plants are ocean thermal energy conversion plants. For operating OTEC temperature difference of 20°C or more between the surface water of ocean and inside water of ocean is required to boil liquid like ammonia or chlorofluorocarbon (CFC). The vapors of the liquid at high pressure used to rotate the turbine of the generator to produce electricity.

Q3: What kind of mirror concave, convex or plane would be best suited for the use in a solar cooker. Why? What is the role of glass sheet used in a solar cooker? Also write two disadvantages of using a solar cooker?

Ans: Concave mirror will be best suited for the use in solar cooker because it concentrates all the sunlight to a point after reflection from the mirror and thus raises the temperature of that point. Plane glass plate does not allow the infrared or heat radiation entered in the box to go outside the box thus heating the box and creating green house effect.

The two disadvantages of using a solar cooker are

(i) Food cannot be cooked at night and on a cloudy day by using a solar cooker.

(ii) Food cannot be cooked quickly by using a solar cooker.

Q4: (a) Distinguish between renewable and non-renewable sources of energy?

(b) Choose the renewable source of energy from the following list: coal, biogas, sun, natural gas.

Ans: (a) Difference between renewable and non-renewable sources :

Renewable sources	Non-renewable sources
The sources of energy which can never be finished and are continuously supplied by nature are known as renewable sources of energy.	The sources of energy which are exhaustible (can be finished) and took lots of time to be formed again are known as non-renewable sources of energy.
For example : Wind, the Sun, Bio-Gas, Hydro-power etc.	For example : Coal, Natural Gas, Petroleum etc.

(b) Biogas and the sun are renewable sources of energy.

### 5 marks Questions:

Q1: (i) What is biogas? Name two main combustible components of biogas?

(ii) What is the use of spent slurry in a biogas plant?

(iii) Name the microorganisms responsible for the fermentation of slurry in the digester?

Ans: (i) Biogas is a mixture of various gases formed when the animal dung mixed with water is allowed to decompose in the absence of air.

The two combustible component of biogas are  $\text{CH}_4$  and  $\text{H}_2$  gas.

(ii) The spent slurry in biogas plant is rich in nitrogen and phosphorous required for the growth of plants and hence can be used as a manure.

(iii) Anaerobic micro- organism.

## QUESTION BANK -I

CLASS: X

SUBJECT: CHEMISTRY

### CHAPTER-1 CHEMICAL REACTIONS AND EQUATIONS

Q1. Explain the term corrosion with an example .Write a chemical equation to show the process of corrosion of iron .Suggest a method to prevent rusting of iron .

Ans. Corrosion is defined as the chemical process of slow eating up of surface of metals due to attack of atmospheric gases and various chemicals .ex. Rusting of iron , when an iron object is left in damp air for a considerable time , it gets covered with a red-brown flaky substance called rust.



Rusting of iron can be prevented by galvanization .In this process a thin layer of zinc metal is deposited on iron objects .Galvanization is done by dipping an iron object in molten zinc metal . A thin layer of zinc metal is formed all over the iron object as a result the surface of iron objects is protected from rusting.

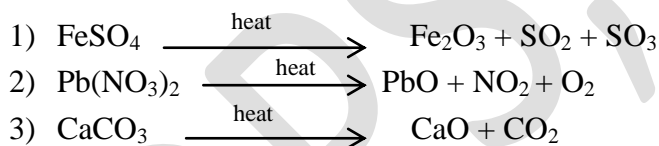
Q2. Define rancidity. Explain any three ways by which rancidity of food materials can be checked.

Ans. The slow oxidation of fats and oils present in food resulting in bad smell and taste.

Methods to check rancidity:

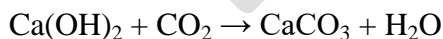
- Food materials are often packed in air tight containers. Oxygen has no access to them and oxidation resulting in rancidity is prevented.
- Refrigeration of food also slows down rancidity. Due to lower temperature, oxidation is slowed down.
- It is always advisable to place food materials in places away from direct sunlight. This slows down the process of rancidity.

Q3. a) Complete the following equation for chemical reaction.



b) What happens when :  $\text{CO}_2$  is bubbled through lime water in small amount and in excess amount . Write the reactions involved.

Ans. When  $\text{CO}_2$  is passed in small amount solution becomes milky due to formation of insoluble calcium carbonate .



When it is passed in excess amount the milkiness of solution disappears due to formation of soluble calcium hydrogen carbonate .

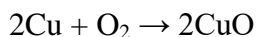


Q4. A shining brown coloured element X on heating in air becomes black in colour.

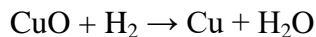
- Name the element X and the black colored compound formed .

2) How can this black compound be again converted into element X ?

Ans. 1) The element X is copper and the black colored compound is copper oxide .



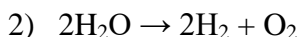
2) Hydrogen gas is passed through the black copper oxide and as a result , it gets reduced to copper which is brown in color.



Q5. In the electrolysis of water :

- 1) Name the gas collected at the cathode and anode respectively .
- 2) Why is the volume of one gas collected at one electrode double than that of the other ?
- 3) How will you test the evolved gases ?

Ans. 1)  $\text{H}_2$  gas is collected at cathode  $\text{O}_2$  gas at anode.



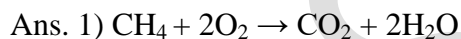
Thus , water decomposes to give hydrogen and oxygen in the ratio of 2:1 by volume .

3) Hydrogen burns with a pop sound when a burning matchstick is brought near the gas . If a burning matchstick is brought in contact with oxygen gas it starts burning brightly.

Q6. Write the balanced chemical equations for the following reactions .

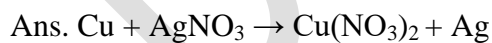
- 1) Natural gas burns in air and combines with oxygen to form carbon dioxide .
- 2) During respiration glucose combines with oxygen and forms carbon dioxide and water .

Are these reactions exothermic or endothermic? Give reasons .



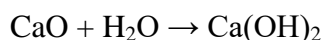
The above reactions are exothermic in nature as in both the reactions heat is released.

Q7. a) In the refining of silver , the recovery of silver from silver nitrate solution involved displacement by copper metal .Write the reaction involved.



b) A solution of substance X is used for white washing . Write the reaction of substance X with water .

Ans. The substance X is calcium oxide  $\text{CaO}$ .



Q8. What do you mean by precipitation reaction. Explain by giving examples .

Ans. The reactions in which a solid insoluble substance separates out on mixing aqueous solutions of salts are called precipitation reactions .

- a)  $\text{AgNO}_3 + \text{NaCl} \rightarrow \text{AgCl} + \text{NaNO}_3$   
b)  $\text{BaCl}_2 + \text{Na}_2\text{SO}_4 \rightarrow \text{BaSO}_4 + \text{NaCl}$

Q9. Why do we store silver chloride in dark colored bottles? Explain in brief .

Ans . Silver chloride is sensitive to sunlight . When exposed to it , the salt decomposes into silver and chlorine . In order to check the decomposition it is kept in dark colored bottles .

Q10. Magnesium ribbon burns with a dazzling flame in air and changes to white substance magnesium oxide . Is magnesium being oxidized or reduced in this reaction ?

Ans.  $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$

Mg is oxidized to MgO in this reaction .

## CHAPTER-2 ACIDS , BASES AND SALTS

Q1. Why are some salts called hydrated salts ?What happens when crystals of copper sulphate are heated in a test tube ?

Ans. Salts which contain molecules of water of crystallization are called hydrated salts .The color of copper sulphate crystals changes from blue to white as on heating it loses 5 molecules of water of crystallization .

Q2. Account for the following.

- a) Antacid tablets are used by a person suffering from stomach pain .  
b) Distilled water does not conduct electricity whereas rain water does.  
c) Sodium hydroxide cannot be kept in aluminium containers .

Ans. a) The stomach pain is generally due to release of excess HCl in stomach . The antacid tablets contain either baking soda  $\text{NaHCO}_3$  or milk of magnesia  $\text{Mg(OH)}_2$  , both neutralize the effect of acid by reacting with it and give relief from pain .

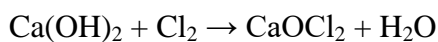
b) Distilled water is a weak electrolyte and does not dissociate into ions .So, it does not conduct electricity .However rain water contains some dissolved acids like carbonic acid  $\text{H}_2\text{CO}_3$  and sulphurous acid  $\text{H}_2\text{SO}_3$  which dissociate into ions . Hence , rain water conducts electricity .

c) Sodium hydroxide solution reacts with aluminium to form sodium aluminate and hydrogen gas is evolved .Therefore, it cannot be kept in container made of aluminium .



Q3. What is bleaching powder chemically called ? Give a reaction for its preparation and two uses.

Ans. Bleaching powder is chemically called calcium oxychloride .



It is used as an oxidizing agent in many chemical industries and for disinfecting drinking water to make it free from germs .

Q4. HCl and  $\text{HNO}_3$  show acidic characters in aqueous solution while alcohol and glucose solutions do not. Give reasons .

Ans. Both  $\text{HCl}$  and  $\text{HNO}_3$  ionize in water to release  $\text{H}^+$  ions which make the solution acidic. On the otherhand alcohol and glucose donot ionize in water. so they donot show acidic character. Q5. Name the chemicals used in the Soda Acid fire extinguishers and the gas evolved from it when used ?

Ans. The chemicals used are sodium hydrogen carbonate  $\text{NaHCO}_3$  and dilute sulphuric acid  $\text{H}_2\text{SO}_4$ . The gas evolved in the reaction is  $\text{CO}_2$ .

Q6. A milkman adds a very small amount of baking soda to fresh milk.

- Why does he shift the pH of the fresh milk from 6 to slightly alkaline.
- Why does this milk take a long time to set as curd ?

Ans. a) Fresh milk is slightly acidic due to presence of lactic acid and has a pH of 6. It turns sour easily to become more acidic. in presence of baking soda, milk becomes alkaline and does not turn sour easily because the alkali will neutralize the effect of lactic acid present in milk. b) When milk sets as curd its pH decreases. In the alkaline medium, it takes longer time to achieve acidic medium back so that milk may set as curd.

Q7. Give two important uses of washing soda and baking soda.

Ans. Washing soda

- It is used in the manufacture of glass, paper and soaps.
- It is used for removing permanent hardness of water.

Baking soda

- It is used for making antacids.
- It is used in soda acid fire extinguishers.

Q8. State what happens when a concentrated solution of sodium chloride (brine) is electrolyzed? Write the equation involved. Name the process and mention one use of each product.

Ans. When concentrated solution of sodium chloride (brine) undergoes electrolysis we get  $\text{NaOH}$ , Chlorine gas and hydrogen gas.

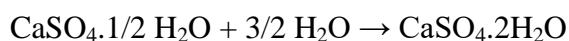
The equation involved is :  $\text{NaCl} + \text{H}_2\text{O} \rightarrow \text{NaOH} + \text{H}_2 + \text{Cl}_2$

This process is called chlor-alkali process.

Hydrogen is used in the manufacture of ammonia, chlorine is used in the manufacture of bleaching powder and sodium hydroxide is used in the manufacture of soaps.

Q9. A white chemical compound becomes hard on mixing with proper quantity of water. it is used to maintain joints in a fixed position. Name the chemical compound and what happens when water is added to this compound in proper quantity?

Ans. The chemical compound is plaster of Paris chemically called calcium sulphate hemihydrate.



On adding a small quantity of water, it changes to Gypsum which is quite hard.

Q10. a) Define universal indicator.



b) Name one salt whose solution has pH more than 7 and one salt with pH less than 7 .

c) What are olfactory indicators ? Give one example .

Ans. a) Universal indicator is a mixture of indicators .it gives different colors at different pH values.

b)  $\text{Na}_2\text{CO}_3$  has pH more than 7 and  $\text{NH}_4\text{Cl}$  has pH less than 7.

c) The indicators which give different smells in acidic and basic solutions are called olfactory indicators .ex. Vanilla extract

### **CHAPTER-3 METALS AND NON-METALS**

Q1. You must have seen tarnished copper vessels being cleaned with lemon or tamarind juice. Explain why these sour substances are effective in cleaning the vessels.

Ans. Copper metal slowly reacts with water, carbon dioxide and oxygen present in air to form basic copper carbonate which is green in color. Its layer slowly gets deposited on the surface of metals. Now lemon juice contains citric acid and tartaric acid present in tamarind. Both these acids react with basic copper carbonate to form soluble salts. These salts are removed from the surface of copper metal and surface of metal shines.

Q2. Give reasons for the following.

- d) Platinum, gold and silver are used to make jewellery.
- e) Sodium, potassium and lithium are stored under oil.
- f) Aluminium is highly reactive but it is still used for cooking utensils.
- g) Carbonate and sulphide ores are usually converted into oxides during the process of extraction of metals.

Ans. a) Platinum, gold and silver are highly unreactive metals. Therefore they do not undergo corrosion due to attack by moisture and atmospheric gases. Further they are malleable and ductile. Because of these properties they are used to make jewellery.

b) Sodium, potassium and lithium are readily attacked by  $\text{O}_2$  present in air to form their respective oxides. They also react with moisture present in air producing  $\text{H}_2$  gas which sometimes catches fire and causes accidents. To protect these metals from  $\text{O}_2$  and moisture and to prevent accidental fires sodium, potassium and lithium are stored under oil.

c) Aluminium is highly reactive, when exposed to moist air its surface is covered with a thin impervious layer of aluminium oxide  $\text{Al}_2\text{O}_3$ . This layer does not allow moist air to come in contact with the fresh metal and hence protects the metal underneath from further damage or corrosion. It is because of this reason aluminium is highly reactive metal, it is still used for cooking utensils.

d) Direct reduction of carbonate and sulphide to obtain metals is not possible. However, it is much easier to obtain metals by reduction of their oxides. Therefore prior to reduction Carbonate and sulphide ores are usually converted into oxides by the process of calcinations and roasting respectively.

Q3. a) Why do ionic compounds conduct electricity in molten state and not in solid state?

Ans. Ionic compounds conduct electricity in molten state because in molten state the heat provided overcomes the force of attraction between ions. As a result the ions separate and are free to move so ionic compounds

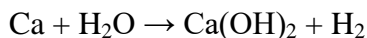
conduct electricity in molten state whereas in solid state the ions are not free to move due to strong inter-ionic force of attraction. Hence they do not conduct electricity in solid state.

b) Why is sodium chloride soluble in water but not in kerosene or petrol?

Ans. Sodium chloride consists of  $\text{Na}^+$  and  $\text{Cl}^-$  ions. These ions are held together by strong electrostatic forces of attraction. Water molecules, being polar can break these forces to form  $\text{Na}^+$  and  $\text{Cl}^-$  ions which have independent existence. As a result of this independent existence,  $\text{NaCl}$  dissolves in water. On the other hand, molecules of kerosene oil, being non-polar cannot overcome the strong electrostatic forces of attraction between  $\text{Na}^+$  and  $\text{Cl}^-$  ions and hence  $\text{NaCl}$  does not dissolve in kerosene or petrol.

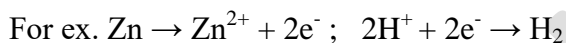
Q4. Explain why calcium metal after reacting with water starts floating on its surface. Write the chemical equation for the reaction.

Ans. Calcium reacts with water to evolve hydrogen gas. Bubbles of the gas stick on the surface of metal. As a result calcium starts floating on the surface of water.



Q5. Metals replace hydrogen from dilute acids whereas non-metals do not. Give reasons.

Ans. Metals are electropositive in nature. Their atoms readily lose electrons to form positive ions. The electrons are accepted by  $\text{H}^+$  ions of the acid to evolve hydrogen gas.



On the other hand non-metals are electronegative in nature. This means their atoms can take up electrons and cannot lose them. Therefore they do not evolve hydrogen on reacting with dilute acids.

Q6. a) Name the ores of metals mercury and zinc.

b) Name the components of alloy brass and solder.

Ans. a) Mercury: Cinnabar  $\text{HgS}$

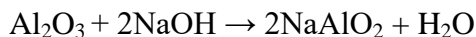
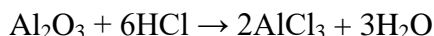
Zinc: Calamine  $\text{ZnCO}_3$  and Zinc blend  $\text{ZnS}$

b) Brass: Copper and Zinc

Solder: Lead and Tin

Q7. What are amphoteric oxides? Give an example.

Ans. These are the oxides which can act both as acids and bases. ex.  $\text{Al}_2\text{O}_3$



Q8. What is an alloy? How is it prepared and what is the advantage of making an alloy?

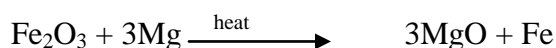
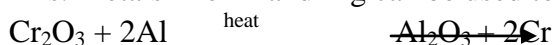
Ans. An alloy is a homogeneous mixture of two or more metals or a metal and small amounts of non metals. An alloy is prepared by mixing the various metal in molten state in required proportions, then cooling their mixture to the room temperature.

The advantages of alloys are:

- a) They are stronger and harder than the metals from which they are made.
- b) They are more resistant to corrosion.
- c) They modify chemical reactivity of metals.

Q9. Name two metals which can be reduce to metal oxides to metals.

Ans. Metals like Al and Mg can be used to reduce certain oxides of less reactive metals to their oxides. For ex.



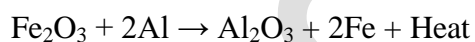
Q10.a) Why the wires carrying current in homes have a coating of PVC.

b) How is aluminium used to join railway tracks? Name the reaction.

c) Why is gold alloyed with copper?

Ans. a) Electric current is carried generally by the copper wires. In order to insulate these, they are given a coating of PVC which acts as an insulator.

b) Reduction of ferric oxide by aluminium is used join railway tracks . These displacement reactions are highly exothermic. The amount of heat evolved is so large that keeps iron in molten state. The molten iron fills the gap and joins the railway tracks. This reaction is called thermit reaction.



- d) Pure gold (24 carat) is very soft and is not suitable for making jewellery . In order to make it hard, it is generally alloyed with copper.

**CHAPTER-LIFE PROCESS**

**Q1 What are the two stages in photosynthesis?**

Ans. Two stages in photosynthesis –

**a) Light reaction** – Light energy breaks up water molecular into hydrogen and oxygen, called photolysis of water

**b) Dark reaction** – Fixation and conversion of carbon – dioxide (CO<sub>2</sub>) into a simple carbohydrates glucose.

**Q2 What is the difference between arteries & veins?**

Ans. **Arteries**, like **veins**, are tube-shaped vessels that carry blood in the body. The chief **difference between arteries and veins** is the job that they do. **Arteries** carry oxygenated blood away from the heart to the body, and **veins** carry oxygen-poor blood back from the body to the heart.

**Q3 What is villi? What are its functions?**

Ans. Finger like projection present in the inner lining of small intestine are called villi. They increase the surface area for the absorption of digested food in the small intestine.

**Q4 How is opening and closing of stomata regulated?**

Ans. The closing and openings of the stomata is regulated by guard cells. When the guard cells swell or turgid due to entry of water, the stomata are opened. The guard cells shrink due to loss of water the stomata get closed.

**Q5 State two vital functions of kidney.**

Ans. Function of kidney are –

- 1) It maintains water balance in the body tissues.
- 2) It controls calcium levels in the blood to maintain healthy bones.

**Q6 Differentiate between aerobic and anaerobic respiration.**

Ans. Both **aerobic and anaerobic respiration** involve chemical reactions which take place in the cell to produce energy, which is needed for active processes. **Aerobic respiration** takes place in the mitochondria and requires oxygen and glucose, and produces carbon dioxide, water, and energy.

**Q7 What is the role of glomerulus in kidney?**

Ans. Glomerulus is a group of capillaries present in the cup like Bowman's Capsule. It receives blood from renal artery which brings excretory wastes from body to the kidney. It filters water, salts, glucose, urea, the nitrogen containing end products of proteins and yellow bile compounds from the liver.

**Q8 What are the raw materials for photosynthesis?**

Ans. Raw materials for photosynthesis are –

- a) Carbon – dioxide      b) Water      c) Chlorophyll and Sunlight

**Q9 What is the role of diaphragm during inhalation and exhalation?**

Ans. Diaphragm changes its shape during inhalation and exhalation and increases and decreases volume of thoracic cavity respectively. This causes entry and expel of air from lungs.

**Q10 What is the advantage of four chambered of heart?**

Ans. The right and left parts are separated by a septum to prevent oxygenated and deoxygenated blood from mixing. This fulfills the constant use of energy to maintain their

body temperature. Their energy needs are high, which are fulfilled efficiently because of non – mixing of oxygenated & deoxygenated blood.

**Q11 Why is diffusion insufficient to meet the oxygen requirements of multicellular organisms like humans?**

Ans. As in multicellular organisms, all the cells are not in direct contact with environment, simple diffusion does not meet the requirement of all the body cells.

**Q12. What criteria do we use to decide whether something is alive?**

Ans. All the living organism must have movement at molecular levels along with respiration and other life process like nutrition, respiration, transportation and excretion to be called alive.

**Q13 What is the function of digestive enzymes?**

Ans. Enzymes break-down the various complex components of food into simple and soluble components so that they can be absorbed easily.

**Q14 How are the lungs designed in human beings to maximize the area for exchange of gases?**

Ans. In lungs, the bronchioles terminate in balloon-like structures called alveoli. The alveoli contain network of blood capillaries that increase the surface area for exchange of gases.

**Q15. What is the role of saliva in the digestion of food?**

Ans. The saliva contains an enzyme called salivary amylase that breaks down starch which is complex molecule into glucose.

**Q16 While eating you are advised not to talk Why are you advised so?**

Ans. We are advised so because while eating some food particles might enter the wind pipe which can lead to choking.

**Q17 Name the respiratory organs of (i) fish (ii) mosquito (iii) earthworm.**

Ans. **Fish** - gills

**Mosquito** - Trachea (air tubes)

**Earthworm** - moist skin

**Q18 Veins and arteries carry blood. Which of these carry blood?**

a) Away from the heart?                      b) Back to the heart?

Ans. a) Arteries carry blood away from the heart.

b) Veins carry blood back to the heart.

**Q19 Which of the organs perform the following functions in humans?**

i. Absorption of food.                      ii. Absorption of water

Ans. i. Absorption of food takes place in small intestine.

ii. Large intestine

**Q20 Why is the process of diffusion insufficient to meet the oxygen requirement of human beings?**

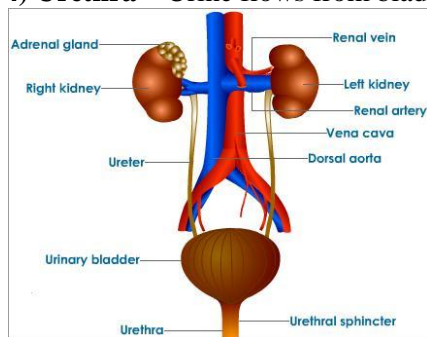
Ans. The process of diffusion for carrying O<sub>2</sub> to all parts of the body is not sufficient for larger multicellular organisms like human beings. Hence, respiratory pigment hemoglobin takes up oxygen from the air and carry it to all the parts of our body through blood

**Q21 What is 'clotting of blood'?**

Ans. Formation of clot at the site of injury to stop bleeding is known as 'clotting of blood'.

**Q22 With the help of a labelled diagram of human excretory system, Mention its important part and explain them.**

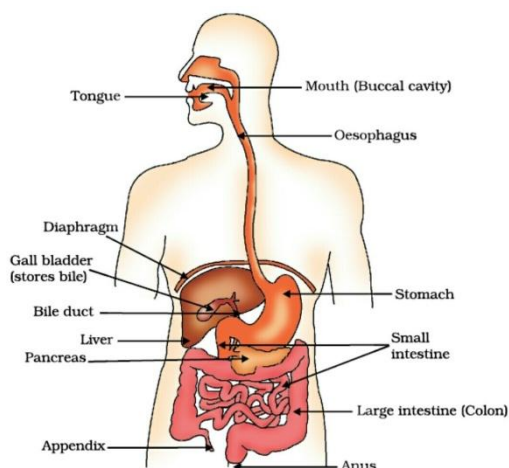
- Ans. **1) Kidney** – It is the functional unit of excretory system. Each kidney is made up of about million microscopic coiled channels called nephrons. Nephrons are the basic filtration unit in the kidneys. It consists of – Glomerulus's, Bowman's capsule, convoluted tubule.
- 2) Ureter** – Wastes comes out of the kidney into the ureter.
- 3) Urinary bladder** – Ureter pours its contents into a muscular sac called the urinary bladder.
- 4) Urethra** – Urine flows from bladder to the outside through the urethra.



**Q23(i) Draw a well labeled diagram of human digestive system**

**(ii) Describe the role of following in digestion.**

- a) Bile                      b) Salivary amylase                      c) HCl



Ans.

- a) **Bile** – emulsification of fats
- b) **Salivary amylase** – digest starch in mouth
- c) **HCl** – Activate pepsinogen by making medium acidic in stomata.

**Q24 With the help of labeled diagram, Discuss the mechanism of respiration in human beings.**

Ans. Mechanism of Respiration – It occurs in following steps

**a) Breathing** – Taking in oxygen and expelling carbon – dioxide out is called breathing. It involves following steps –

**(i) Inhalation** – It is taking in oxygen. It occurs due to contraction of muscles attached to ribs. This lifts ribs and flatter diaphragm, which increase the volume of thoracic cavity.

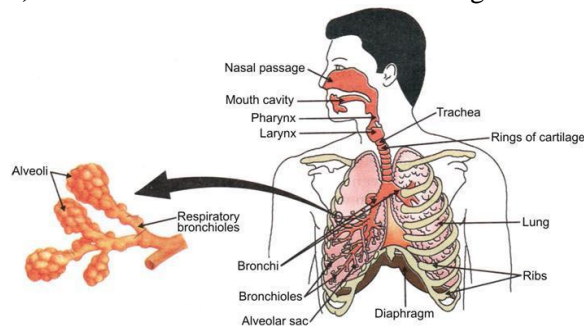
Hence the pressure inside the thoracic cavity decreases and air rushes inside of the lungs.

**(ii) Exhalation** – It is expelling of carbon – dioxide. It occurs due to relaxation of muscles attached to ribs and diaphragm is done shaped. This decreases the volume of thoracic cavity and decreases air pressure and expels out of the lung.

**b) Exchange of gases** – It takes place between the alveoli of lungs and surrounding blood capillaries.

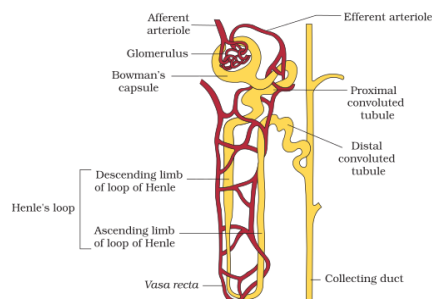
**c) Transport of gases in blood** – Hemoglobin present in the blood transport. in blood. Oxygen is transport from the lungs to the body cells in the form of any hemoglobin.

**d) Oxidation of food** – Break down of glucose molecules which produce energy.



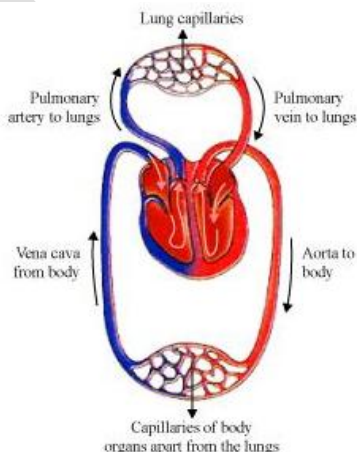
**Q25 Describe the structure and functioning of nephron.**

Ans. Each nephron is a cluster of very thin-walled blood capillaries. Each capillary cluster in the kidney called glomerulus is associated with the cup shaped Bowman's capsule that collects the filtered urine. Nephron filters the blood in order to remove nitrogenous waste. They also absorb some useful substance such as glucose, amino acids, minerals and amount of water from filtration



**Q26 Describe double circulation in human beings. Why is it necessary?**

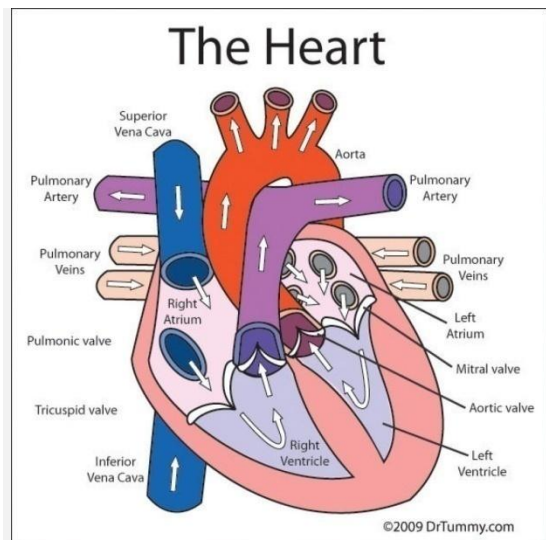
Ans. In mammals and birds the blood goes through the heart twice during each cycle. This is known as double circulation. Deoxygenated blood which enters right auricle and then it enters the right ventricle from where it is pumped to lungs for oxygenation. From lungs after oxygenation it comes to left auricle and then enters left ventricle from where it is pumped to various parts of body. Such system of circulation does not allow mixing of oxygenated and deoxygenated blood which allows efficient supply of oxygen to the body control



**Q27 Explain circulatory system in human beings.**

**Ans.** The muscular organ which is located near the chest slightly towards the left in the thoracic region. It is the very crucial organ of our body which works continuously throughout our life. The human heart is divided into four chambers which are involved in the transportation of oxygenated blood and deoxygenated. The upper two chambers are called as atria whereas the lower two chambers are called as ventricles. The human circulatory system is more advanced than that of other animals like fish, reptiles, etc. In the human body, blood

circulates through the heart twice.

**Q28 What is blood? what are the different types of blood?****Ans. Blood**

The fluid connective tissue which plays a vital role in circulating food, hormones, water, air and other necessary products of different parts of the body. Blood flows through a specified set of pathways called blood vessels. The organ which is involved in pumping blood to different body parts is the heart. Blood cells, blood plasma, proteins, and salts together constitute the human blood. The composition of blood are: Plasma, the fluid part of the blood that is composed of 90% of water.

Blood cells, the solid part of blood.

**There are three types of blood cells.**

**Red blood cells (RBC) / Erythrocytes:** They are mainly involved in transporting oxygen, food, and other substances to various parts of the body. These blood cells also function by removing the waste from the body.

**White blood cells (WBC) / Leukocytes:** They are specialized in defense. They fight against foreign particles entering the body.

**Platelets / Thrombocytes:** Platelets help in clotting of blood at the time of wound or cut.

**CHAPTER-CONTROL AND COORDINATION****Q29 Mention three important functions of gibberellins.**

**Ans.** Functions of Gibberellins –

- (i) Stimulate stem elongation.
- (ii) Help in breaking seed dormancy.
- (iii) Promote flowering in some plants even under unfavorable conditions
- (iv) Help in seed germination.
- (v) Promote production of male flowers.

**Q30 What is the function of receptors in our body? What happens when receptors do not work properly?**

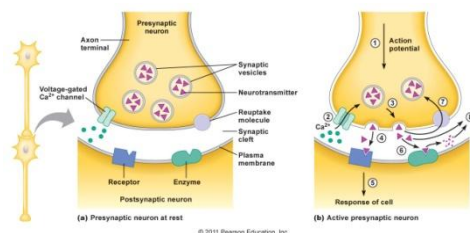
**Ans.** The function of receptors is to detect information from the environment. If receptors do not work properly, the information obtained from the environment will be delayed to reach the spinal cord or brain. In this situation, the response to the environmental stimulus will be delayed causing harm to the body.

**Q31 What happens at the synapse between two neurons?**

**Ans.** The nerve impulse gets transmitted through the synapse by means of chemical signals. When a stimulus acts on the receptor, chemical reaction is set off which produces an impulse in it. This impulse travels from the dendrite of presynaptic neuron to its cell body and then



along its axon. At the end of axon of this neuron, the electrical impulse releases tiny amount of a chemical substance crosses the synapse and starts a similar electrical impulse in the dendrite of the next neuron



**Q32 What is the need for a system of control and co – ordination in an organism?**

Ans. a) It evokes an appropriate movement in response to any change in external environment

b) Multicellular organisms have complex body. So it, co – ordinates various organs of body of an organism work together in a proper manner to produce proper reaction to stimulus

**Q33 Pituitary is a master endocrine gland. Justify this statement.**

Ans. Pituitary gland is also known as master gland because it controls the activities of most of the gland. It regulates the secretion of other glands. Like

a) **Growth hormones** – Body growth and development of bones

b) **Thyroid stimulating hormone** – Secretion of hormones from thyroid gland.

c) **Adrenocorticotrophic hormone** – Secretion of hormones from adrenal glands.

d) **Follicle stimulating hormone** – Stimulating of growth of ovaries and testes

e) **Luteinizing hormone** – Secretion of hormone from ovaries & testes

f) **prolactin** – Regulation of function of mammary gland. Hence, most of functions are controlled by pituitary gland so it is called master gland.

**Q34 Draw the structure of neuron and explain its function.**

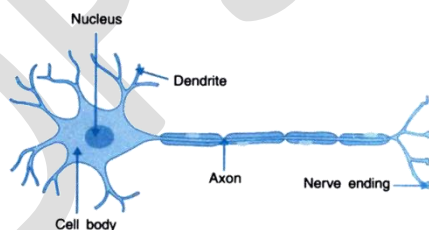
Ans. Neuron has three components –

(i) Cell body

(ii) Dendrites

(iii) Axon

The dendrite picks up the nerve impulse from receptors and then pass the impulses to the cell body and then along the axon. The axon passes the impulse to another neuron through a junction called synapse.



**Q35 How does our body respond when adrenaline is secreted into the blood?**

Ans. When adrenaline is secreted into the blood, it prepares our body for action. It speeds up heart beat and breathing, raises blood pressure and allows more glucose to go into the blood to give us a lot of energy quickly to fight or run away from frightening situation. The blood supply decreases from the skin and digestive system and increase to skeletal muscles. All these conditions help the individual to respond to the emergency situation.

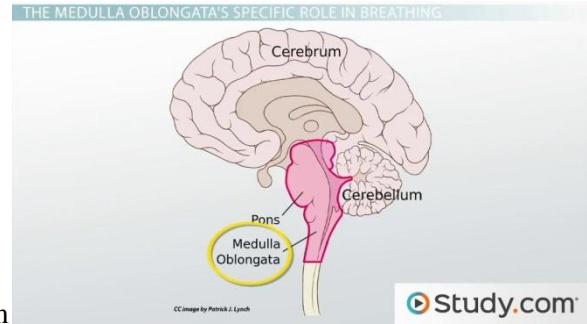
**Q36 Where are Pons and medulla oblongata located? Write their functions.**

Ans. Pons and medulla Oblongata are located in hind brain.

Pons acts as bridge between brain and spinal cord.

Medulla oblongata –

a) It is the reflex centre to control activities like salivation, swallowing, vomiting, breathing, coughing, sneezing and heart beat



b) It also controls sleeps, consciousness and activities of cerebrum

**Q37 List the function of testosterone and estrogen. Where are they secreted?**

Ans. Testosterone is secreted in males – It is responsible for development of male sex organs and secondary sex characteristics like moustache, beard & voice.

Estrogen is secreted in females – it is responsible for development of female sex organs and secondary sex characteristics like mammary gland and uterine growth.

**Q38 Define 'nerve impulse'. Which structure in a neuron helps to conduct a nerve impulse?**

a) Towards the cell body?

b) Away from the cell body?

Ans. Nerve Impulse – It is the passing of information through neurons in the form of electrical and chemical signals. This is called nerve impulse.

a) Dendrite

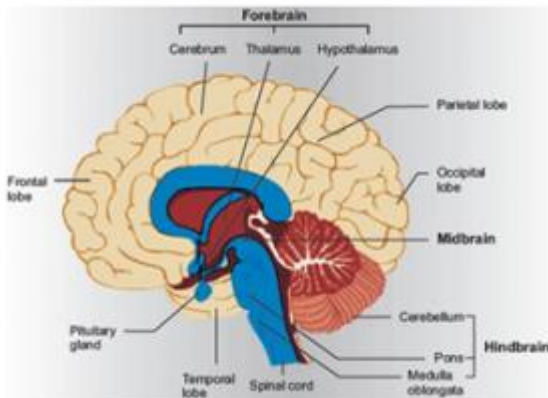
b) Axon

**Q39 Differentiate between axon and dendrons?**

Ans. **Dendrites** receive electrochemical impulses from other neurons, and carry them inwards and towards the soma, while **axons** carry the impulses away from the soma. ... Generally, **dendrites** receive neuron signals, and **axons** transmit them. Most neurons have a lot of **dendrites** and only have one **axon**.

**Q40 Mention the structure of human brain.**

Ans.



**Q41 What are tropic movements? Name the types of tropic movements in plants.**

Ans. The bending or movement of a part of plant in response to the external stimulus is called tropism or tropical movement. It is of following types.

(a) **Phototropism** – It is response to light. It may be towards light (positive) or away from the light (negative).

(b) **Geotropism** – It is response to gravity – It may be towards stimulus (positive) and away from the stimulus (negative)

(c) **Chemotropism** - Response to chemicals. It may be positive or negative.

(d) **Hydrotropism** – Response to water. It may be positive or negative.

**Q42 Name the different lobes of cerebrum.**

Ans. Different lobes of cerebrum –

- a) **Frontal lobe** – It is associated with reasoning.
- b) **Parietal** – Perception of general sensations like pressure, touch and pain.
- c) **Occipital** – Visual perception.
- d) **Temporal** – Important for interpreting sounds and the language we hear and formation of memories.

**Q43. How do auxins promote the growth of tendril around a support?**

Ans. When the tip of a tendril touches a support, then the auxins present in its tip move to that side of tip which is away from the support, auxins promote growth. So, due to more auxins in it, the side of tendril, away from the support, grow faster and becomes longer than the side which is in contact with the support and makes the tendril curve towards the support.

**Q44 Write difference between exocrine and endocrine glands.**

Ans. To simplify, there's a small and main difference between exocrine and endocrine glands. **Exocrine gland** have duct to let their secretion out like sweat glands. ...**Endocrine** glands are ductless glands meaning their secretions are directly poured into the bloodstream.

**Q45 What are the different kinds of neurons?**

Ans. Kinds of neurons –

- a) **Sensory neurons** – convey impulses from receptors to the main nervous system.
- b) **Motor neurons** – carry impulses from the main nervous system to an effector.
- c) **Connecting (Relay) neurons** – connect sensory and motor centres.

**Q46 How does chemical co-ordination takes place in animals. Mention their function.**

Ans. The chemical co-ordination in animals takes place through hormonal system called endocrine system. Animal hormones are chemical messengers which are directly poured into the blood by the endocrine glands. Thus, a hormone reaches to the cells. The cells have special molecules on their surface to detect these chemical compounds and recognize the information a particular hormone carrying. There the cells act accordingly. The chemical co-ordination is fast as hormones diffuse readily around the cells.

**Q47 What is the difference between a reflex action and walking?**

Ans. 1) **Reflex actions** are sudden, involuntary reactions of the body in response to stimuli. They occur without the involvement of the conscious areas of the brain. ... Later conscious responses are made. **Walking** is a **voluntary action** which happens under the control of cerebellum of the brain.

**Q48 What happens at the synapse between two neurons?**

Ans. At synapse, the electrical impulse generated at a dendrite of a neuron is passed on to dendrite of another neuron in form of chemical impulses. The chemical present at synapse is called neurotransmitter.

**Q49 How do auxins promote the growth of a tendril around a support?**

Ans. When tendrils come in contact of any support, the part of the tendril in contact does not grow as rapidly as the part away from the object due to auxin secreted moves away from the object in contact. This rapid growth on one side causes tendril to circle around the object.

**Q50 Design an experiment to demonstrate hydrotropism.**

Ans. Take a tin box with hole at bottom. Fill it with moist saw dust. Sow some gram seeds in it. Keep the tin box in tilted position. When seeds start germinating, water the saw dust only in lower side of the tin box. You will observe that the radicle move towards the wet saw dust. This shows that root is positively hydrotropic.

**Q51. Why are some patients of diabetes treated by giving injections of insulin?**

Ans. Diabetes is caused due to non or less secretion of hormone insulin by pancreas. In such person, the blood sugar level is high. Insulin converts extra sugar present in blood into glycogen. Patients suffering from diabetes are given insulin injection to control their blood sugar level.

**Q52 What is the function of receptors in our body? Think of situation where receptors do not work properly. What problems are likely to arise?**

Ans. Receptors detect all the information from our environment. These receptors are located in our sense organs. In case any of the receptors do not work properly we will not be able to perceive that particular information.

**Q53 How phototropism does occur in plants?**

Ans. Movement of shoot towards light is called phototropism. This movement is caused due to more growth of cells towards the shaded side of the shoot as compared to the side of shoot towards light. More growth of cells is due to secretion of auxin towards the shaded side.

**Q54 Which signals will get disrupted in case of a spinal cord injury?**

Ans. (i) Reflex action  
(ii) Impulses from various body parts will not conducted to brain.  
(iii) Message from brain will not be conducted to various organs.

**Q55 How does chemical coordination occurs in plants?**

Ans. Chemical coordination in plants is maintained by plant hormones also known as phytohormones. Some of these hormones promote growth while some inhibit it. Some hormones include auxin, Gibberellins, Cytokinin etc.

**Q56 How are involuntary actions and reflex actions different from each other?**

Ans. Muscles that are under your conscious control are called **voluntary muscles**. Muscles that are not under your conscious control are called **involuntary muscles**. There are three **different** types of **muscle** in the body. Skeletal **muscle** is made up of **voluntary muscles**, usually attached to the skeleton.

**Q57 Mention one function for each of these hormones.**

i) Thyroxine    ii) Insulin    iii) Adrenaline    iv) Growth hormone    v) Testosterone.

Ans. (i) **Thyroxine** – Control overall metabolic rate of the body (carbohydrate, protein and fat metabolism)

(ii) **Insulin** – Conversion of glucose to glycogen in liver and muscles, thus decreases blood glucose level.

(iii) **Adrenalin** – increases heart beat, blood pressure and blood glucose level.

(iv) **Growth hormone** – Body growth and development of bones.

(v) **Testosterone** – Development of male sex organ and secondary sex characteristics like moustache, beard & voice.

**Q58 a) what are hormones?                      b) list four characteristics of hormones**

Ans. Hormones are chemical substances which are secreted in very less amount by specialized tissues called endocrine glands.

**Characteristics of hormones are –**

- 1) They are required in very less amount.
- 2) Hormones are specific in their function.
- 3) They act away from the site of production.
- 4) Deficiency or over secretions of hormones have negative effects in the body

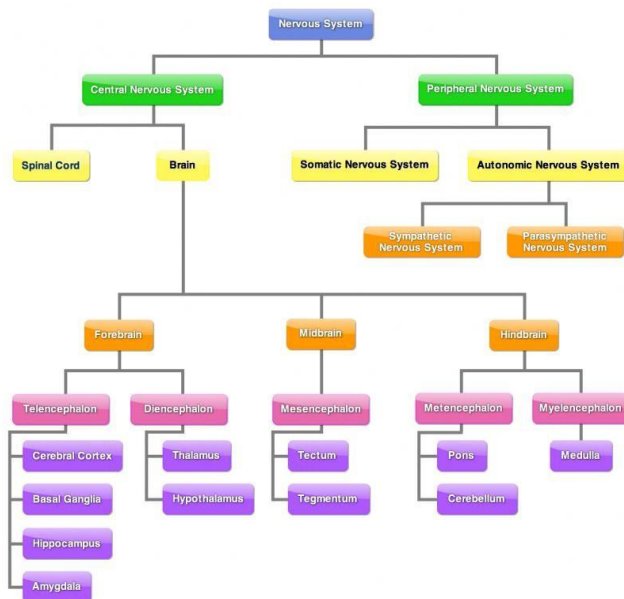
**Q59 Design an experiment to demonstrate hydrotropism.**

Ans. a) Take two glass troughs A and B and fill each one of them two – thirds with soil.

- b) In troughs A plant a tiny seedling. In trough B plants a similar seedling and places a clay pot inside the soil.  
 c) Water the soil in trough A daily and uniformly. Do not water the soil in trough B but put some water in clay pot and leave both the trough for a few days.  
 d) Now, dig up the seedling carefully from both the troughs without damaging their roots.  
 Observation – Roots of seedling in trough in A is straight. The root of seedling in trough B is bent.

**Q60 Describe Nervous system in humans.**

**Ans.**



**CHAPTER-HOW DO ORGANISMS REPRODUCE**

**Q61 What changes occur in girls and boys in the age group of 10 -14 years?**

**Ans.** Changes in males (boys)

- 1) Widening of shoulder.
- 2) Deepening of voice
- 3) Appearance of beard and moustaches
- 4) Growth of sex organs

Changes in females (girls)

- 1) Widening of pelvis and hips.
- 2) High pitch voice.
- 3) Growth of auxiliary and pubic hair
- 4) Initiation of menstrual cycle.
- 5) Growth of mammary glands.

**Q62 Describe sexually transmitted diseases (STDs) and mention the ways to prevent them.**

**Ans.** Those infectious diseases which are spread by sexual contact called sexually transmitted diseases (STDs)

Methods for prevention of STDs

- a) The people should be educated about various STDs
- b) Extra – marital relations should be avoided
- c) Sex without proper precaution should be avoided
- d) High standard of moral education should be give to the people.

**Q63 Name the surgical methods of birth control in human males and females respectively.**

**Ans.** Surgical methods of birth control are –

- a) **Vasectomy** – small pieces of both the vas deferens are cut and removed.

**b) Tubectomy** – Small pieces of both the fallopian tubes are removed.

**Q64 What is micropropagation? Mention its advantages.**

Ans. Micropropagation – It is a type of artificial vegetative propagation in which an isolated plant part is cultured under aseptic conditions with proper nutrient medium. Advantages of micropropagation.

- a) It is a quick method of multiplication of plants.
- b) Virus free plants are produced by this method from virus infected plants
- c) It can overcome seed dormancy

**Q65 What are the post fertilizational changes in the flower?**

Ans. Post – fertilization changes in flowers are –

- a) The sepals, petals and stamens wither off
- b) Style and stigma degenerate
- c) Ovary develops into fruit
- d) Ovules grows into seed
- e) Integuments of the ovule act as seed coats.
- f) Fertilized egg gets converted into embryo which bear plumule, radicle and cotyledons.
- g) Fertilized polar nuclei form endosperm which may or may not be consumed during seed development.

**Q66 What are the advantages of vegetative propagation?**

Ans. Advantages of vegetative propagation –

- a) It is a rapid, cheap and easy method of reproduction for the multiplication of plants
- b) Genetically identical plants (clones) are produced by this method
- c) Superior quality fruits or flowers can be produced by grafting.
- d) Disease free plants can be produced by this method

**Q67 Describe any 3 methods of asexual reproduction**

Ans. Methods of asexual reproduction –

- a) Primary fission** – It is a type reproduction in which one parent organism divides into two new organisms. Firstly nucleus divide and then division of cytoplasm takes place.
- b) Spore formation** – A spore is a small microscopic structure with a thick wall. Spores are formed in a structure called sporangium. Nucleus inside sporangium divides repeatedly and produces many nuclei. Each nucleus is surrounded by cytoplasm and called spore.
- c) Fragmentation** – It is the breaking of an organism into two or more parts upon maturation, each of which grows to form a new individual.

**Q68 What changes occur in ovaries during menstrual cycle?**

Ans. Change occurs in ovaries during menstruation

- a) 1 – 4 days** – Corpus luteum degenerates. The ovary starts preparing for the maturation of a new follicle.
- b) 5 – 13 days** – Ovarian follicle develops to optimum. Estrogen secreted by ovaries causes thickening of uterine wall.
- c) 14 day** – Egg gets released from the ovary. It enters the fallopian tube, known as ovulation.
- d) 15 to 28 days** – After releasing the egg, the follicle part produces corpus luteum which produces progesterone. If pregnancy has not occurred, corpus luteum degenerates corpus luteum. This restarts menstrual cycle once again.

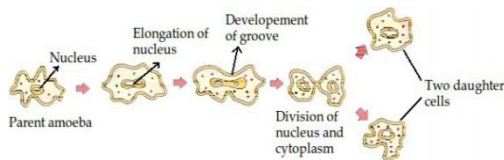
**Q69 Describe budding in yeast, a fungus**

Ans. a) It is a type of asexual reproduction in which an outgrowth (bud) is formed on the parent organism due to single cell division.

- b) The bud gradually grows in size and gets detached form the parent body.
- c) Detached bud develops into an adult organism, similar to the parent.

**Q70 Diagrammatically represent binary fission in amoeba**

Ans.



Binary fission in Amoeba

**Q71 What is grafting? Why is it used in horticulture practices?**

Ans. In grafting, cutting of a plant stem is attached to another rooted plant. The cutting of stem which is grafted on the other plant is scion and the rooted plant on which the cutting is grafted is called stock. The scion and stock are placed one over other and tied in such a way that there is no gap between them. The cambium activity takes place among them and they get joined. Grafting is used in plants which do not produce extensive roots.

**Q72 What are the different methods of contraception?**

Ans. Different methods of contraception are –

- a) **Barrier method** – In this method, a device used to prevent the entry of sperms in the female genital tract example – Condom, Diaphragm, Cervical caps.
- b) **Chemical method** – In this method certain drugs (containing hormones) are used by the females. These drugs are available in the form of pills. There are two kinds of pills commonly used for preventing pregnancies – oral pills and vaginal pills or creams.
- c) **Intrauterine contraceptive devices (IUCD'S) – IUCD like copper – T** is placed in the uterus – IUCD prevent implantation of the fertilized ovum inside the uterus.

**Q73 What is AIDS? Name its causal organism. Mention its symptoms.**

Ans. AIDS is a sexually transmitted disease. Its full form is acquired immune deficiency syndrome. It is a viral disease, caused by human immune deficiency virus. Its symptoms are a) Destroys the immune system of body.

b) Persistent cough and fever.

c) Body attacked by other diseases like pneumonia, TB and certain cancers.

**Q74 What is the importance of DNA copying in reproduction?**

Ans. DNA contains information for the inheritance of features from parents to next generation. DNA presents in nucleus of cells are the information source for making protein. If information is different, different protein will be made that lead to altered body design.

**Q75 How does binary fission differ from multiple fissions?**

Ans. In **Binary Fission** a single parent is split into 2 daughter cells whereas in **multiple fission** a single parent splits to form many new daughter cells at the same time. ...**Binary fission** makes two daughter cells whereas **multiple fission** makes many or you can say **multiple** daughter cells.

**Q76 Why is DNA copying essential part of the process of reproduction?**

Ans. DNA contains information for the inheritance of features from parents to next generation. DNA presents in nucleus of cells are the information source for making protein. If information is different, different protein will be made that lead to altered body design.

**Q77 How does the embryo get nourishment inside the mother's body?**

Ans. The embryo gets nutrition from the mother's blood with the help of a special tissue called placenta. This is a disc which is embedded in the wall of uterus. It contains finger-like projections villi on the embryo's side of the tissue. On mother's sides are blood spaces, which surround the villi. This provides a large surface area for glucose and oxygen to pass the mother to the embryo and waste products from embryo to mother.

**Q78 Why does menstruation occurs.**

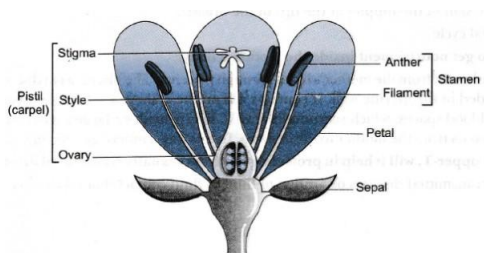
Ans. When in human female if the egg is not fertilized, it lives for about one day. Since the ovary releases one egg every month, the uterus also prepares itself every month to receive a



fertilized egg. Thus, its lining becomes thick and spongy. This would be required for nourishing the embryo if it had fertilized. However, this lining is not required any longer. So, the lining slowly breaks and comes out through the vagina as blood and mucus. This cycle takes roughly every month and is known as menstruation.

**Q79 Draw a labeled diagram of the longitudinal section of a flower.**

**Ans.**

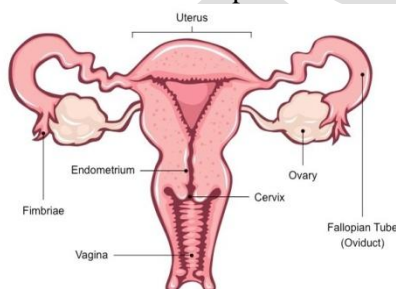


**Q80 Describe triple fusion in plants? Where does it occur? Draw a neat and clean well labeled diagram to support your answer.**

**Ans.** After pollination, the pollen grains germinate on the stigma by producing pollen tube. This pollen tube is formed from inner wall of the pollen grain. It penetrates the stigma and passes through the style and enters the ovule through an opening called male gamete. It releases two male gametes in the embryo sac. One male gamete fuses with egg cells and the second fuses with two polar nuclei. The fusion of one male gamete with the egg cells is called syngamy. The fusion of second male gamete with two polar nuclei is called triple fusion. This process occurs in ovary.

**Q81 Draw a well labeled diagram of female reproductive system and mention its parts.**

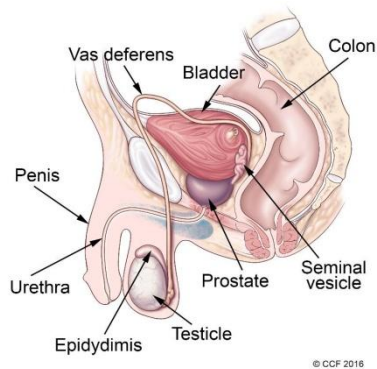
**Ans.** a) A pair of ovaries – ovaries produce ova and female sex hormone. One egg is produced every month by one of the ovaries. Ova are picked up by the funnel-shaped fallopian tubes.  
 b) Fallopian tubes – There are two fallopian tubes. It carries ova from ovary to the uterus. Fertilization occurs in fallopian tubes.  
 c) Uterus – Pear-shaped hollow muscular organ. Fertilized ovum remains attached to the uterus wall.  
 d) Vagina – It is a narrow muscular tube. Its upper end is connected to the cervix of the uterus and lower end opens outside through an opening. It is a place for copulation.



**Q82 Draw a well labeled diagram of male reproductive system and describe its parts.**

**Ans.** a) **A pair of testes** – Each testis produces sperms and male sex hormone called testosterone. Testes are present in a small pouch called scrotum.  
 b) **Epididymis** – It is a long coiled tube. The head is connected with testis and tail is connected with vas deferens.  
 c) **Vas deferens** – It is a long tube which begins from the tail of epididymis.  
 d) **Urethra** – It receives the vas deferens from both the testes. It opens outside through penis. It carries both sperms and urine.





**Q83 Differentiate between asexual and sexual reproduction.**

Ans

**Asexual reproduction**

- 1 Only one parent is involved
- 2 Offspring resembles exactly with the parent
- 3 parents Cell divides mitotically
- 4 Gametes are not produced
- 5 gametes Organisms produced have less adaptability

**sexual reproduction**

- 1 Two parents are involved
- 2 Organisms do not resemble exactly
- 3 Mitosis and meiosis both divisions are involved
- 4 Gametes are produced
- 5 Organisms produced has more adaptability.

.....XXXXXX.....