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Physics

Chapter 6: Electricity

1. **What is the value of one coulomb?**
   1 Coulomb charge = Charge present on approx. 6×10^{18} electrons
2. **What is potential difference? Write its unit?**
   Potential Difference (V) : Work done to move a unit charge from one point to another.
   S. I. unit of Potential difference is Volt (V)
   Potential difference (V) between two points = Work done (W)/Charge (Q)
   $V = W/Q$
   The SI unit of electric potential difference is volt (V),
3. **What is the meaning of one volt?**
   1 Volt : When 1 joule work is done in carrying one Coulomb charge then potential difference is called 1 volt.
   Therefore, 1 volt =1 joule/1 coulomb
   $1\ V = 1\ J\ C^{-1}$
   Voltmeter : Instrument to measure potential difference.
   • It has high resistance and always connected in parallel. Symbol is
   • Cell is the simplest device to maintain potential difference.
   • Current always flow from higher potential to lower potential.
4. **How much energy is given to each coulomb of charge passing through a 6 V battery**
   Potential difference = Work Done/Charge
   ∴ Work done = Potential difference × charge
   Where, Charge = 1 C and Potential difference = 6 V
   ∴ Work done = 6×1 = 6 Joule.
5. **What is electric current? Write is SI unit.**
   Electric current is the rate of flow of electric charges. motion of electrons in an electric circuit constitutes an electric current.
   The electric current is expressed by a unit called ampere (A),
6. **Define on ampere.**
   One ampere is constituted by the flow of one coulomb of charge per second, that is, 1 A = 1 C/1 s. Small quantities of current are expressed in milliampere (1 mA = 10^{-3} A) or in microampere (1 μA = 10^{-6} A).
   An instrument called ammeter measures electric current in a circuit. It is always connected in series in a circuit through which the current is to be measured.
7. **What is electric circuit and circuit diagram?**
   An electrical circuit is the complete loop through which an electrical current flows. It is made up of a series of electrical components and conductors
   (e.g., batteries, electrical wires, light bulbs, etc.)
   The current only flows in an electrical circuit when the path is completely closed, forming a loop.
   Schematic representation of electric circuit is called circuit diagram.
8. **State Ohm's Law .**

Ohm's Law : Potential difference across the two points of a metallic conductor is directly proportional to current passing through the circuit provided that temperature remains constant.

• Mathematical expression for Ohm's law

$$V \propto I$$

$$V = IR$$

Here R is proportionality constant called resistance

R is a constant called resistance for a given metal.

9. What is resistance? Writ its SI unit.

Resistance (R) : It is the property of a conductor to resist the flow of charges through it.

• S. I. unit of resistance is Ohm (Ω)

10. Define one Ohm.

• When potential difference is 1 V and current through the circuit is 1 A, then resistance is 1 ohm.

11. What is variable resistance or Rheostat?

Variable resistance (**Rheostat**) is a component used to regulate current without changing the source of voltage.

12. On what factors does the resistance of a conductor depends?

Factors on which the Resistance of a Conductor depends :

Resistance of a uniform metallic conductor is

(i) directly proportional to the length of conductor,

(ii) inversely proportional to the area of cross-section,

(iii)directly proportional to the temperature and

(iv) depend on nature of material.

13. What is resistivity? Write its SI unit.

It is defined as the resistance offered by a cube of a material of side 1m when current flows perpendicular to its opposite faces.

• Its S.I. unit is ohm-metre (Ωm).

resistance of a uniform metallic conductor is directly proportional to its length (l) and inversely proportional to the area of cross-section (A).

$$R \propto l$$

$$\text{and } R \propto \frac{1}{A}$$

$$\text{or, } R = \rho \frac{l}{A}$$

where ρ (rho) is a constant of proportionality and is called the electrical resistivity of the material of the conductor.

Note:

Resistivity does not change with change in length or area of cross-section but it changes with change in temperature.

14. How resistivity vary from materials to materials ?

The metals and alloys have very low resistivity in the range of $10^{-8}\ \Omega$ m to $10^{-6}\ \Omega$ m. They are good conductors of electricity. Insulators like rubber and glass have resistivity of the order of 10^{12} to $10^{17}\ \Omega$ m. Both the resistance and resistivity of a material vary with temperature.

15. **How resistivity of an alloy is different from its constituent metals?**
Resistivity of an alloy is generally higher than that of its constituent metals. Alloys do not oxidise (burn) readily at high temperatures. For this reason, they are commonly used in electrical heating devices, like electric iron, toasters etc. Tungsten is used almost exclusively for filaments of electric bulbs, whereas copper and aluminium are generally used for electrical transmission lines. Resistivity does not change with change in length or area of cross-section but it changes with change in temperature.

16. **Alloys are used in electrical heating devices. Why?**
- Alloys do not oxidize (burn) readily at high temperature, so they are commonly used in electrical heating devices.
- Copper and aluminium are used for electrical transmission lines as they have low resistivity.

17. **List the advantages of parallel combination over series combination.**
(i) In series circuit, when one component fails, the circuit is broken and none of the component works.
(ii) Different appliances have different requirement of current. This cannot be satisfied in series as current remains same.
(iii) The total resistance in a parallel circuit is decreased.

18. **Write a note on electric fuse.**
Electric Fuse : It is a safety device that protects our electrical appliances in case of short circuit or overloading.
- Fuse is made up of pure tin or alloy of copper and tin.
- Fuse is always connected in series with live wire.
- Fuse has low melting point.
- Current capacity of fuse is slightly higher than that of the appliance.

19. **Define Joule's law of heating.**
The law implies that heat produced in a resistor is
(i) directly proportional to the square of current for a given resistance,
(ii) directly proportional to resistance for a given current, and
(iii) directly proportional to the time for which the current flows through the resistor.
$H = I^2Rt$

20. **list the Practical Applications of Heating Effect of Electric Current.**
heating effect of electric current has many useful applications. The electric laundry iron, electric toaster, electric oven, electric kettle and electric heater are some of the familiar devices based on Joule's heating.
The electric heating is also used to produce light. The bulbs are usually filled with chemically inactive nitrogen and argon gases to prolong the life of filament. Most of the power consumed by the filament appears as heat, but a small part of it is in the form of light radiated. Another common application of Joule's heating is the fuse used in electric circuits. It protects circuits and appliances by stopping the flow of any unduly high electric current

21. **What is electric power?**

Electric Power : The rate at which electric energy is consumed or dissipated in an electric circuit.

$P = VI$

$P = I^2R$

S.I. unit of power = Watt (W)

1 Watt = 1 volt × 1 ampere

• Commercial unit of electric energy = Kilo Watt hour (kWh)

1 kWh = 3.6×10^6 J

1 kWh = 1 unit of electric energy

22. Convert 1 kW h to joules.

1 kW h = 1000 x 60 x 60

= 3.6×10^6 watt second

= 3.6×10^6 joule (J)

23.How much energy is given to each coulomb of charge passing through a 6 V battery?

Potential difference, V=6V

Charge , Q =1C

we know that,

V = W/Q

W=V x Q

=6 x 1

= 6 J

Therefore, 6 J of energy is given to each coulomb of charge passing through a 6 V of battery.

24. Will current flow more easily through a thick wire or a thin wire of the same material, when connected to the same source? Why?

Current flows more easily through a thick wire than a thin wire of the same material when they are connected to the same source.

We know that

Resistance, $R = \rho \, l/A$

where,

ρ is the resistivity of the material of the wire,

l is the length of the wire

A is the area of the cross-section of the wire.

From the equation we can say that,

the area of the cross-section of wire is inversely proportional to the resistance.

25. What are the advantages of connecting electrical devices in parallel with the battery instead of connecting them in series?

The advantages of connecting electrical devices in parallel with the battery instead of connecting them in series are:

i) there will be no division of voltage among the appliances

ii) the potential difference across the devices is equal to supply voltage

iii) it reduces the effective resistance of the circuit.

9. Why does the cord of an electric heater not glow while the heating element does?

The heating element of an electric heater is made of an alloy which has a high resistance and resistivity . When the current flows through the heating element, the heating element becomes too hot and glows red. The cord is usually made of copper or aluminium which has low resistance. Hence the cord doesn't glow.

26. Compute the heat generated while transferring 96000 coulomb of charge in one hour through a potential difference of 50 V.

The heat generated can be calculated by Joule's law of heating.

we know that.

$H = I^2Rt$

$H = VIt$ ($V = IR$)

$H = VIt$

$V = 50$ V

$Q = 9600$C

$T =, 1$ h $= 3600$ s

$I = \frac{Q}{t}$

$I = \frac{9600}{3600}$

$I = 26.66$ A

Amount of heat liberated

$H = VIt$

$= 50 \times 26.66 \times 3600$

$= 4.8 \times 10^6$ J

27. How is a voltmeter connected in the circuit to measure the potential difference between two points?

The voltmeter should be connected in parallel between the two points to measure the voltage between any two points.

28. Explain the following.

a. Why is the tungsten used almost exclusively for filament of electric lamps?

The tungsten is used for filament of electric lamps because electric lamps are operated at high temperature but tungsten don't burn readily due to its high resistivity and high melting point.

b. Why are the conductors of electric heating devices, such as bread-toasters and electric irons, made of an alloy rather than a pure metal?

The conductors of electric heating devices are made of an alloy rather than a pure metal because of its high resistivity it produces large amount of heat due to heating effect of electric current.

c. Why is the series arrangement not used for domestic circuits?
The voltage is divided in series circuit as result each component in the circuit receives a small voltage because of which the amount of current decreases and the device gets hot and does not work properly. This is the reason why series circuits are not used in domestic circuits.

d. How does the resistance of a wire vary with its area of cross-section?
Resistance of a wire is inversely proportional to the area of cross section. When the area of cross section increases the resistance decreases and vice versa.
$R \propto 1/A$ (A is the area of a conductor)

e. Why copper and aluminium wires are usually employed for electricity transmission?
Copper and aluminium are good conductors of electricity and have low resistivity because of which they are usually employed for electricity transmission

Note:

		Definition	Measuring Device	Mathematical form	SI Unit
1	**Electric Current:-**	The rate of flow of electric charges	Ammeter	$I = \frac{Q}{t}$	ampere (A)
2	**Potential Difference:-**	Amount of work done to move a unit positive charge from one point to another in the electric field	Voltmeter	$V = \frac{W}{Q}$	volt(V)
3	**Resistance:-**	The opposition offered by a conductor for the flow of electrons	Ohmmeter	$R = \frac{V}{I}$	ohm(Ω)

Light -Refraction.

1. What is refraction of light?
The change of direction of light because of change of medium is known as Refraction or Refraction of Light. The ray of light changes its direction or phenomenon of refraction takes place because of difference in speed in different media.

Note: The light travels at faster speed in rare medium and at slower speed in denser medium. The nature of media is taken as relative. For example air is a rarer medium than water or glass.

2. **State the Laws of Refraction.**

I. The incident ray, refracted ray and normal to the interface of given two transparent media, all lie in same plane.

II. The ratio of sine of angle of incidence and sine of angle of refraction is always constant for the light of given colour and for the pair of given media.

The Second Law of Refraction is also known as Snell's Law of Refraction.

That is, Sin i/Sin r =constant

The constant is called refractive index of the second medium in relation to the first medium.

3. **The refractive index of water, n_w = 1.33. What is the meaning of this statement?**

This means that the ratio of the speed of light in air and the speed of light in water is equal to 1.33.

4. **A ray of light travelling in air enters obliquely into water. Does the light ray bend towards the normal or away from the normal? Why?**

The light ray bends towards the normal.

When a ray of light travels from an optically rarer medium to an optically denser medium, it gets bent towards the normal. Since water is optically denser than air, a ray of light travelling from air into the water will bend towards the normal.

5. **Why does a ray of light bend when it travels from one medium into another?**

Due to change in velocity in the medium and to reduce the time taken to travel the same.

6. **"The refractive index of carbon disulphide is 1.63." What is the meaning of this statement in relation to speed of light?**

Speed of light in carbon disulphide is 1/1.63 times the speed of light in free space.

7. **How should a ray of light be incident on a rectangular glass slab so that it comes out from the opposite side of the slab without being displaced?**

Along the normal to the surface or at an incident angle of i = 0°.

8 . **A doctor has prescribed a corrective lens of power +1.5 D. Find the focal length of the lens. Is the prescribed lens diverging or converging?**

Power of the lens, P = 1.5D

Focal length, f =?

Power of the lens, $P = \frac{1}{f}$

Focal length, $f = \frac{1}{P}$

$= \frac{1}{1.5}$

$= \frac{10}{15}$

= 0.66m

The positive value of focal length indicates the lens is convex or converging.

9.Find the focal length of a lens of power -2.0 D. What type of lens is this?

Power of the lens, P = -2.0D

Focal length, f =?

Power of the lens, $P = \frac{1}{f}$

Focal length, $f = \frac{1}{P}$

$= \frac{1}{-2}$

= -0.5m

The negative value of focal length indicates the lens is concave

10.A concave lens of focal length 15 cm forms an image 10 cm from the lens. How far is the object placed from the lens?

Object distance, u = ?
Focal length of concave lens, f = –15 cm;
Image distance, v = -10 cm
According to the lens formula

$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$

$\frac{1}{-15} = \frac{1}{-10} + \frac{1}{u}$

$\frac{1}{-15} + \frac{1}{10} = \frac{1}{u}$

$\frac{1}{u} = \frac{2-3}{30}$

$\frac{1}{u} = \frac{-1}{30}$

u= -30cm

Therefore, the object placed at 30cm from the lens
The ray diagram is shown below.

11.Find the power of a concave lens of focal length 2 m.

Focal length of concave lens (f) = 2 m

Power of the lens, $P = \frac{1}{f}$

$= \frac{1}{-2}$

= - 0.5D

12.The refractive index of diamond is 2.42. What is the meaning of this statement?

This means that the ratio of speed of light in air and the speed of light in diamond is equal to 2.42.

In other words, the speed of light in diamond is 1/2.42 times the speed of light in free space or vacuum.

13. Define 1 dioptre of power of a lens.

Dioptre is the SI unit of power of lens is denoted by the letter D.

One dioptre can be defined as the power of a lens whose focal length one metre.

14. Mention the reason for the refraction of light.

The change in the speed of the light when travelling from one medium to another medium

15. What is refractive Index? Mention the refractive index of water.

The extent of the change in direction that take place in a given pair of media is expressed in term of Refractive Index.

Refractive index of water n=1.33.

Chapter -3 : Magnetic Effect of Electric Current

1. What is meant by magnetic field?

Magnetic field is a region around a magnetic material or a moving electric charge in which the force of magnetism acts.

2. How is the direction of magnetic field at a point determined?

The direction of magnetic field at a point is determined by placing a small compass needle at that point.

3. Why does a compass needle get deflected when brought near a bar magnet?

The compass needle gets deflected due to the magnetic field around a bar magnet.

4. Why do not two magnetic lines of force intersect with each other?

If two magnetic lines of force intersect each other it would mean that there are two directions of the magnetic field at the point of intersection, which is not possible.

5. What does the degree of closeness of magnetic field lines near the poles signify?

The degree of closeness of magnetic field lines near the poles signifies that magnetic field in that region is strong.

6. State the conclusions that can be drawn from the observation that a current carrying wire deflects a magnetic needle placed near it.
The conclusion that can be drawn is that a magnetic field exists around a current carrying conductor.

7. Why are magnetic field lines closed curves?
The magnetic field lines originate from north pole of a magnet and end at its south pole. Inside the magnet it is directed from south pole to north pole. Therefore, the magnetic field lines are closed curves.

8. Mention the shape of the magnetic field lines around a current carrying straight conductor.
The magnetic field lines around a current carrying straight conductor are concentric circle whose centres lie on the wire.
9. Identify the region, where the magnetic field around a current carrying solenoid is uniform.
Inside the solenoid, the magnetic field is uniform.
10. How can you magnetise a piece of magnetic material?
A piece of magnetic material can be magnetised by keeping it inside a current carrying solenoid.
11. What type of core used to make an electromagnet?
Soft iron core is used to make an electromagnet.
12. What does the divergence of magnetic field lines near the ends of a current carrying straight solenoid indicate?
The divergence of magnetic field lines indicates the increase in strength of magnetic field near the ends of the solenoid.
13. Name the rule which gives the direction of induced current in a conductor.
The rule that gives the direction of induced current is called Flerning's right hand rule.
14. Under what orientation, the induced current produced in moving conductor in a magnetic field can be maximum?
The current induced in a conductor is maximum when direction of motion of conductor is at right angle to the magnetic field.

15. State the rule which is used to find the direction of induced current. Or State Fleming's right hand rule.
Fleming's right hand rule states that, if the fore finger, middle finger and thumb of the right hand are stretched at right angles to each other, with the fore finger in the direction of the field and the thumb in the direction of the motion of the wire, then the current in the wire is in the direction of the middle finger.

16. State Fleming's right hand rule.
Fleming's left hand rule states that, if the forefinger, thumb and middle finger of left hand are stretched mutually perpendicular and the forefinger points along the direction of external magnetic

field, middle finger indicates the direction of current, then thumb points the direction of force acting on the conductor.

17. What is electromagnetic induction?
An electric current produced in a closed circuit by a changing magnetic field is called an induced current. This phenomenon is called electromagnetic induction.

18. List three methods of producing magnetic fields.
Three methods of producing magnetic field are as given below:
(i) Passing electric current through a straight conductor/circuit.

(ii) Passing electric current through a circular loop.

(iii) Passing electric current through a solenoid.

19. What are magnetic field lines? How is the direction of magnetic field at a point determined? Mention two important properties of magnetic field lines?

- The imaginary lines representing magnetic field around a magnet are known as magnetic field lines.
- The direction of the magnetic field at a point can determined using Maxwell's right hand thumb rule.
- Two important properties of magnetic field lines are:

(i) The magnetic field lines are closed and continuous curves.

(ii) They never intersect each other.

20. What are magnetic field lines? Justify the following statements.

(i) Two magnetic field lines never intersect each other.

(ii) Magnetic field lines are closed curves.

The imaginary lines representing magnetic field around a magnet are known as magnetic field lines.
(i) If two field lines intersect each other, this would mean that at the point of intersection the direction of magnetic field is in two directions, which is not possible.

(ii) The direction of field lines outside a magnet is from North pole to South pole while it is from South to North pole inside the magnet and thus forms closed curves.

Which sources produce Alternating Current?
Some sources that produce alternating current are AC generators, thermal power stations, car alternators, etc.

24. How is induced current in a secondary coil related to current in a primary coil?
When current in primary coil changes, then a current is induced in the secondary coil.

25. Why is an alternating current considered to be advantageous over direct current for long range transmission of electric energy?
Alternating current can be transmitted to long distant places without much loss of electric energy. That's why it is considered to be advantageous over direct current for long range transmission of electric energy.

26. **An alternating current has frequency of 50 Hz. How many times does it change its direction in one second?**
The given frequency is 50 Hz, so AC completes 50 cycles in 1 s.
Therefore, it reverses its direction 100 times in one second.

27. How is the type of current that we receive in domestic circuit different from one that runs a clock?
The current that we receive in domestic circuit is alternating current (AC) , while that which runs a clock is direct current (DC).

28. How can it be shown that a magnetic field exists around a wire through which a direct current is passing?
For this place a compass near the wire. As the current starts to flow through the wire, the needle gets deflected. This shows that a magnetic field exists.

29.What precautions should be taken to avoid the overloading of domestic electric circuits?
The following precautions should be taken to avoid the overloading domestic electric circuits as given below:
(i) The circuits should be of proper current rating and appliances should be connected accordingly.

(ii) Wires should be checked from time to time and those wires whose insulation is worn, should be immediately replaced.

(iii) Connection of too many appliances in a single socket must be avoided.

Sources of Energy

1. **Describe how hydro energy can be converted into electrical energy. Write any two limitations of hydro energy.**

High rise dams are constructed on the river to obstruct the flow of water to collect it at a suitable height. The stored water has a lot of potential energy. The water from a suitable height is allowed to fall on the blades of a turbine located at the bottom of a dam through a pipe. Kinetic energy of flowing water rotates the turbine rapidly. Rotation of turbine helps the armature coil of generator to rotate rapidly in the magnetic field. Thus, hydroelectricity is generated.
Limitations of hydro energy:
(i) All river-sites are not suitable for construction of dams.
(ii) Large ecosystems are destroyed when submerged under the water in dam.

2. **Charcoal is a better fuel than wood. Why?**

Charcoal is considered to be a better fuel than wood because:

- It burns without flames.
- It is comparatively smokeless.
- It has higher calorific value, i.e. higher heat generating efficiency than wood.
-

3. How is biogas is produced from biomass?

The biogas plant has a dome-like structure built with bricks. A slurry of cow-dung and water is made in the mixing tank from where it is fed into the digester. The digester is a sealed chamber in which there is no oxygen. anaerobic micro-organisms that do not require oxygen decompose or break down complex compounds of the cow-dung slurry. It takes a few days for the decomposition process to be complete and generate gases like methane, carbon dioxide, hydrogen and hydrogen sulphide. The bio-gas is stored in the gas tank above the digester from which they are drawn through pipes for use.

4. Bio gas is an excellent fuel. Justify the statement by giving two reasons.

It burns without smoke and leave no residue therefore causes no atmospheric pollution.
(ii)Its heating capacity is high, i.e. it has high calorific value.

5. Why hydrogen is not used as common fuel?

hydrogen is not used as common fuel because hydrogen burns with an explosion and it is very difficult to store and transport it.

6. Name the factor that could be considered for choosing the sources of energy?

the factor that could be considered for choosing the sources of energy are:
ease of extracting energy from the source,
cost of extracting energy from the source
efficiency of available technology,
environmental impact of using that source

7.Name two energy sources that you would consider to be renewable. Give reasons for your choices.

The two renewable sources of energy are
energy derived from Biomass as the waste products of plants and animals are continuously produced
energy derived from flowing water, wind, Sun and ocean as long as solar system exists these sources can be harnessed in to energy

8.What kind of mirror – concave, convex or plain would be best suited for use in a solar cooker? Why?

For a solar cooker the heat source is sunlight for heating and cooking. The reason why a mirror is used is to reflect and focus the sunlight. A plane mirror is used because it reflects all the light falling on it to the desired place.

9.What is geothermal energy?

The interior regions of the earth's crust are very hot. The temperature is so high that even rocks can melt. If this heat is utilized as a source of energy it is called geothermal energy.

10. What are the advantages of nuclear energy?

The advantages of nuclear energy are:
It is used to generate electricity
It is used treat diseases like cancer
The fuel once filled can be used for a long time.
Large amount of energy can be obtained from nuclear fission
Fission of 1 atom of uranium produces 10 million times the energy that is obtained by burning 1 atom of carbon

Chemistry

3. Metals and Non-metals

1) Give an example of metal which

a) Liquid at room temperature – **Mercury**
b) Best conductor of heat - **Silver**
c) can be easily cut with knife - **Sodium**
d) poor conductor of heat - **Mercury and lead**

2) Define

a) Malleability - The ability of metals to be made in to thin sheets.
b) Ductility - The ability of metals to be drawn in to thin wires.
c) Sonority - The metals that produce a sound on striking a hard surface.

3) Give reasons

a) Platinum, gold and silver are used to make jewellery- Because they are very lustrous, very less reactive and do not corrode easily.

4) **Differentiate between metals and non-metals on their physical properties**

METALS	**NON METALS**
Lustrous	Non lustrous
Hard	Brittle
Malleable	Non malleable
Ductile	Non ductile
Good conductor of heat and electricity	Bad conductor of heat and electricity
Sonorous	Non sonorous
High melting point and boiling point	Low melting point and boiling point

5) **Differentiate between metals and non-metals based on their chemical properties**

METALS	NON METALS
Metals are electropositive.	Non-metals are electronegative.
They react with oxygen to form basic oxides. $4Na + O_2 \longrightarrow 2Na_2O$	They react with oxygen to form acidic or neutral oxides. $C + O_2 \longrightarrow CO_2$
These have ionic bonds.	These have covalent bonds.
They react with water to form oxides and hydroxides. Some metals react with cold water, some with hot water, and some with steam. $2Na + 2H_2O \longrightarrow 2NaOH + H_2\uparrow$	They do not react with water.
They react with dilute acids to form a salt and evolve hydrogen gas.However, Cu, Ag, Au, Pt, Hg do not react. $2Na + 2HCl \longrightarrow 2NaCl + H_2\uparrow$	They do not react with dilute acids. These are not capable of replacing hydrogen.
They react with the salt solution of metals. Depending on their reactivity, displacement reaction can occur. $CuSO_4 + Zn \longrightarrow ZnSO_4 + Cu$	These react with the salt solution of non-metals.
They act as reducing agents (as they can easily lose electrons). $Na \longrightarrow Na^+ + e^-$	These act as oxidising agents (as they can gain electrons). $Cl_2 + 2e^- \longrightarrow 2Cl^-$

6) What are amphoteric oxides? Give two examples of them.

Metal oxides which react with both acid as well as bases to produce salts and water are known as amphoteric oxides. Ex: Aluminium oxide , zinc oxide etc

7) Give reasons.

a) Sodium, potassium and lithium are kept in kerosene oil.

Sodium, potassium, and lithium are very reactive metals and react very vigorously with air as well as water. Therefore, they are kept immersed in kerosene oil in order to prevent their contact with air and moisture.

b) Alluminium is highly reactive metal, yet it is used to make utensils for cooking.

Though aluminium is a highly reactive metal, it is resistant to corrosion. This is because aluminium reacts with oxygen present in air to form a thin layer of aluminium oxide. This oxide layer is very stable and prevents further reaction of aluminium with oxygen. Also, it is light in weight and a good conductor of heat. Hence, it is used to make cooking utensils.

c) Tarnished copper vessels are cleaned with lemon or tamarind juice.

Copper reacts with moist carbon dioxide in air to form copper carbonate and as a result, copper vessel loses its shiny brown surface forming a green layer of copper carbonate. The citric acid present in the lemon or tamarind neutralises the basis copper carbonate and dissolves the layer. That is why, tarnished copper vessels are cleaned with lemon or tamarind juice to give the surface of the copper vessel its characteristic lustre.

8) Zinc liberates hydrogen gas when reacted with dilute hydrochloric acid, whereas copper does not. Why?

Zinc is more reactive than hydrogen. But copper is less reactive than hydrogen.

9) A shiny brown metal X, on heating in air becomes black in colour. Name the metal X and the black coloured compound formed.

The metal 'X' is copper and the black coloured compound formed is copper oxide.

10) Magnesium floats on water when it reacts with hot water. Give reason.

Magnesium starts floating because the bubbles of hydrogen gas formed stick to the surface of the metal.

11) Why aluminium Oxide is referred as amphoteric oxide?

Aluminium Oxide reacts with both acid as well as bases to produce salts and water.

12) Food cans are coated with Tin and not Zinc because

a) Zinc is costlierthanTin
b) Zinc has a higher melting pointthanTin
c) zinc is more reactive thanTin
d) zinc is less reactive thantin

Food cans are coated with tin and not with zinc because zinc is more reactive than tin.

13) What is reactivity series? Write the reactivity series.

The reactive series of metals is a chart listing metals in order of decreasing reactivity.

K > Na > Ca > Mg > Al > Zn > Fe > Pb > Cu > Ag > Au

14) Why do ionic compounds have high melting points?

Ionic compounds have strong electrostatic forces of attraction between the ions. Therefore, it requires a lot of energy to overcome these forces. That is why ionic compounds have high melting points.

15) Describe the formation of ionic bond in the sodium chloride.

A sodium atom has one electron in its outermost shell. If it loses the electron from its M shell then its L shell now becomes the outermost shell and that has a stable octet. The nucleus of this atom still has 11 protons but the number of electrons has become 10, so there is a net positive charge giving us a sodium cation Na+. On the other hand chlorine has seven electrons in its outermost shell and it requires one more electron to complete its octet. If sodium and chlorine were to react, the electron lost by sodium could be taken up by chlorine. After gaining an electron, the chlorine atom gets a unit negative charge, because its nucleus has 17 protons and there are 18 electrons in its K, L and M shells. This gives us a chloride anion C1–. So both these elements can have a give-and-take relation between them as follows Sodium and chloride ions, being oppositely charged, attract each other and are held by strong electrostatic forces of attraction to exist as sodium chloride (NaCl).

$Na \rightarrow Na^+ + e^-$
2,8,1 2,8
(Sodium cation)

$Cl + e^- \rightarrow Cl^-$
2,8,7 2,8,8
(Chloride anion)

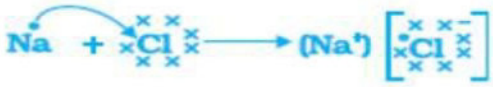


Figure 3.5 Formation of sodium chloride

16) Mention the characteristics of ionic compounds

* They are solids, brittle and break in to pieces when pressure is applied.

* They have high melting and boiling points. * They are soluble in water but insoluble in organic solvents. * They conduct electricity in molten state. They have ionic bond

17) Common salt conducts electricity only in molten state. Why?

Because common salt contains ions in molten state.

18) Name two metals which are found in nature in the Free State?

Platinum and gold.

19) Give reasons

a) Carbonate & sulphide ores are usually converted into oxides during the process ofextraction.

Carbonate and sulphide ores are usually converted into oxides during the process of extraction because metals can be easily extracted from their oxides rather than from their carbonates and sulphides.

20) Differentiate between roasting and calcination?

Roasting	Calcination
The sulphide ores are converted in to oxides by heating strongly in the presence of excess air.	The carbonate ores are changed in to oxides by heating strongly in limited air.

21) What is thermite reaction?

Thermite reactions are highly exothermic. The amount of heat evolved is so large that the metals are produced in the molten state. Hence used to join railway tracks or cracked machine parts.

22) What are alloys? Give examples

An alloy is a homogeneous mixture of two or more metals or a metal and a non metal.

Examples: Stainless steel, Bronze, Solder and brass.

23) Give reason why copper is used to make hot water tanks and not steel (an alloy of iron)

Copper does not react with cold water, hot water, or steam. However, iron reacts with steam. If the hot water tanks are made of steel (an alloy of iron), then iron would react vigorously with the steam formed from hot water.

24) What is corrosion? List the techniques used to prevent corrosion of metals.

When metals are exposed to moist air for a long time acquires a coating of their respective oxides called corrosion or rust. Corrosion can be prevented by painting, oiling, greasing, galvanizing, chrome plating, anodizing or making alloys.

25) Define Galvanisation.

Galvanisation is a method of protecting steel and iron from rusting by coating them with a thin layer of zinc.

Periodic classification of elements

One Mark Questions

1. Why did scientists try to classify the elements?

As more elements were discovered by scientists, it was difficult to organize the information and properties of the elements. Hence scientists started finding similarities and began to group them based on the properties.

2. State Dobereiner's law of triads.

When the 3 elements were arranged in the increasing order of their atomic mass The atomic mass of the middle ailment was roughly the average of the atomic masses of the other 2 elements.

3. State Newlands law of octaves

When the elements are arranged in the increasing order of their atomic mass every 8th element has properties similar to that of the 1st.

4. State Mendeleev periodic law

The properties of the elements are the periodic functions of their atomic mass

5. State modern periodic law

Mobile the properties of the elements are the periodic functions of their atomic number

6. What are valence electrons?

The electrons present in the outermost shell of the element are called valence electrons.

7. Define Valency.

The combining capacity of an element is called as valency.

8. Define atomic size

The radius of an atom is called us atomic size. It is the distance between the nucleus and the outermost shell.

9. What is effective nuclear charge?

The effective nuclear charge is the net positive charge experienced by an electron in a polyelectronic atom.

10. Define electro negativity.

The tendency of an atom to attract a shared pair of electrons (or electron density) is its electro negativity.

11. What do you mean by electro positivity of an element?

The tendency of an element to lose electrons and become a positive iod is called as electro positivity of an element..

12. What were the limitations of Dobereiner's classification?

Dobereiner's could find only 3 triads from the elements known at that time. Hence this system of classification was not found to be useful.

13. How many triads did Dobereiner identify during his classification of elements?

Dobereiner's could only find 3 triads.

14. Which Dobereiner's triads existed in the columns of Newlands' octaves?

The triads of Dobereiner's Existed in Newlands octaves.

15. Why do you think Mendeleev placed noble gases in a separate group?

Noble gases were chemically inert and hence he placed them in a separate group.

16. What suggestion of Henry Moseley led to the modification of Mendeleev's periodic table into modern periodic table?

Henry Moseley's Suggestion that atomic number is more fundamental property than atomic mass, led to the modification of Mendeleev's periodic table into modern periodic table.

17. Why do atomic size and ionization energy have reciprocal relation?

Atomic size is the distance from the nucleus to the valence shell. Ionization energy is the energy required to remove the most loosely held electron from a gaseous atom or ion. Ionization energy increases across a period and decreases down the family. So as the Atomic size increase less ionization energy is required to remove electron.

18. **Name the group having tetravalency.** The group having tetravalency is 14.

19. **Name the element having a monoatomic molecule?** 18th group elements

20. 'f' block elements are kept separate why?

The block elements have more horizontal similarity than vertical similarity as seen in s, p and d block elements.

21. In modern periodic table hydrogen is placed separately. Why?

Hydrogen shows properties of both the halogen group and the 1st group elements that is the reason why it is placed separately.

22. Why do group 1 elements form unipositive ions?

The elements of the 1st group have only 1 valency, Because of this they can donate 1 electron. Hence their unipositive ions.

2 mark Questions

23. Define groups and periods

Groups: The vertical columns of the periodic table are called groups.

Periods: The horizontal rows of the periodic table are called periods.

24. What are metalloids? give examples

Elements whose properties are intermediate between metals and non-metals are called metalloids. Ex- Boron(B), Silicon(Si), Germanium(Ge), Arsenic(As),

25. **Why are noble gases placed in different group?**

The outer shell of the noble gases are completely filled. Hence they do not require any electron and they don't participate In any chemical reaction. Therefore they are placed in the 18th group separately.

26. Ritu argues that Na, Si and Cl follow Dobereiner's law of triads, where as Seema says they do not follow Dobereiner's law of triads. Who among them is correct and why? (Atomic masses of Na-23, Si-28, Cl-35.5)

A= Na-23, B= Si-28, C= Cl-35.5

According to Law of triads Dobereiner's law

$$B = \frac{A+C}{2} = \frac{23+35.5}{2} = \frac{58.5}{2}$$

$$= 26.25$$

Since the answer is not near the predicted value, Seema is telling correct x

27. What is atomic radius? How does it change along a period in the modern periodic table?

Nuclear size / radius is the distance between the nucleus and the outermost shell of the atom.

In the modern periodic table, it decreases from left to right in a period and increases down the group.

28. Name the periodicity of the elements?

The main periodic trends of the modern periodic table include valency, electronegativity, ionization energy, atomic radius, electro positivity, metallic and non-metallicity, and chemical reactivity.

29. X element belongs to the 13^{th} group. Write its electronic configuration and valency?

X = 13, Electronic configuration K = 2, L = 8 M = 3, Valency - 3

30. How does metallic property change in the periodic table when going from left to right across a period and down the group?

In the modern periodic table, the metallic property decreases when we move left to right in a period. The metallic property increases when we move down the group.

31. What are the uses of periodic table?

Uses of a modern periodic table

i. Elements are placed in increasing order of atomic number, which is the basic property of the period.

ii. Elemental trends are steadily rising.

iii. In addition to describing the elemental tendencies, the relationship between the trends and the electron configuration can be established.

iv. If the properties of one element of the group is known, the properties of the other elements of the group can be predicted.

v. This table is easy to remember and study.

3 mark Questions

32. List the achievements or advantages of the Mendeleev periodic table.

Achievements or advantages of a periodic table by Mendeleev are

1. The atomic mass of the elements were taken into account to classify their basic properties and similar chemical properties.
2. He chose properties of the elements based on oxides hydrogen and oxygen.
3.Mendeleev left a few blank boxes and predicted the availability of elements that had not been discovered until then.
5. The properties of some of the elements that he predicted were discovered during his lifetime and provided evidence of the usefulness of his table.

33. What were the limitations of Mendeleev's periodic table?

The limitations of Mendeleev's periodic table were

1. Hydrogen was not given fix position.
2. Discovery of Isotopes (elements with same atomic numbers but different atomic masses) could not find a place in the table.
3 Atomic masses do not increase in regular manner, So it was difficult to predict how many elements would be invented between the 2 elements

34. List the limitations of Newland's law of octaves.

Limitations of Newland's octave rule were

1. This rule did not apply after calcium.
2. The elements invented after Newland's law did not follow the law..
3. The position of Cobalt and nickel could not be explained.

4. Iron, similar to nickel and cobalt properties, was kept away from them.
5. With the invention of inert gases the octave rule became irrelevant.

35. What were the criteria used by Mendeleev in creating his periodic table

The criteria used by Mendeleev for the creation of their periodic table

1. His observations were based on atomic mass and also chemical properties .
2. He also considered the physical properties of the elements.
3. His classification was mainly about the formation of elemental hydrides and oxides.
4. Since the characteristics of inert gases are different from those of other elements, they are placed in a different group.

36. How did modern periodic table remove various anomalies of Mendeleev's periodic table?

1. Hydrogen was given suitable position in the modern periodic table.
2. Many properties of the elements were described by atomic number.
3. Elements like nickel and cobalt that had property similar with iron were placed with it.

37. Differentiate between the arrangement of elements in Mendeleev and Modern periodic Table.

Mendeleev periodic table	Modern periodic table
* Elements are arranged in increasing order of atomic masses	* Elements are arranged in increasing order of atomic number
*There are 7 groups & 6 periods in Mendeleev periodic table	*There are 18 groups & 7 periods in Mendeleev periodic table
*Elements having similar properties were placed directly under one another.	*Elements having similar valence electrons were placed directly under one another.
*The position of hydrogen could not be explained.	*Hydrogen is placed above alkali metals based on its valence electrons.
*No distinguishing positions for metals and non-metals	*Metals are on the left hand side and non-metals on the right hand side of the periodic table.

38. The two elements $_6C^{12}$ and $_6C^{14}$get different positions/places in the modern periodic table? Explain your answer. Write to which period and group do these two elements in the modern periodic Table. Explain

Both 6C12 and 6C14 assume the same position in the modern periodic table. This is because the elements in this table are created based on their atomic number. Since their atomic number is the same, they fall into the same group.

The atomic number of C is 6, K = 2, L = 4

It belongs to the 14th group because of 4 valence electrons in the last shell, And second period since there are only 2 shells.

39. Write the group and the period for the following elements

a) Sodium (atomic No-11) K = 2, L = 8, M = 1
(atomic number 11) Period-3, Group-1

K = 2 and L = 6

b) Oxygen (atomic No-8) Period-2, Group-16

B) Oxygen (atomic number 8)

40. What do you mean by metallic character of an element? How does it vary as we go down the group? Give reason for this variation.

Metallic properties are the properties of the elements that are capable of giving up electrons. Metallic properties increase as we move down the group, because the greater the radius of the atom, the more electrons in the outermost orbit, give away electrons with less nuclear charge.

4 mark Questions

41. a) In modern periodic table, use of atomic number was more beneficial. How? Explain

Only the atomic number of elements varies. Different elements may have the same atomic mass, but the atomic number is different. For this reason, the atomic number is more appropriate.

b) Sodium and Chlorine are placed in the first and 17^{th} group of the modern periodic table. Write there valences? Which of them will form Cation and anion? Give reason for your answer.

Since sodium is in the first group element, its valency is 1. Its Valency of the seventeenth group of chlorine is also 1.

Sodium (Na) Z = 11 K = 2, L = 8, M = 1, Chlorine (Cl) Z = 17 K = 2, L = 8, M = 7

Sodium is a metal that has a tendency to give up electrons so that it causes a Na + cat ion. Since chlorine is a non-metal, it is capable of obtaining an electron so it becomes an ion.

42. Periodic table

[a] A soft metal stored under kerosene - Sodium

[b] An element which is tetravalent and forms the basis of organic chemistry - Carbon

[c] An element which is an inert with atomic number 2 - Helium

[d] The metal which is an important constituent of limestone - Calcium.

2.Acid,Bases and Salts

1. Write the differences between acids and bases

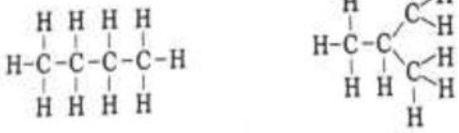
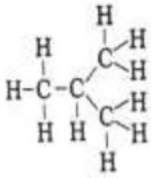
ACIDS	BASES
1.Sour taste 2. Acid + Blue litmus -----Red (ABR)	1. Bitter taste 2. Base + Red litmus------- Blue(BRB)

3. Have more H^+ ions 4. P^H is less than 7	3.Have more OH^- ions 4. P^H is above seven and below 14

2. Name the gas produced when acids react with metals? How will you test it?
Hydrogen gas is produced when metals react with then we pass the hydrogen gas through soap solution it produces bubbles. if you take a candle near the purple it explodes with pop sound.
3.Which gas is produced when metal carbonates react with acids and how can you confirm the gas?
Carbon di oxide is released. when we pass carbon di oxide through lime water, it turns milky.
4. What is neutralisation reaction ? example
Acids react with base to give water and salt is called neutralization.
Ex. HCl (aq)+ NaOH (aq)--- ---------- NaCl(aq) + H_2O
5. Acid solution conducts electricity why?
It produces hydronium ions in solution state. So it conducts electricity.
6. Two solutions' A 'and 'B' having pH 6 And 8 respectively. Which of them have more hydrogen ions? Which one is acid and which one is base among them.
Solution 'A' has more hydrogen ions. Solution 'A 'is acidic and solution' B' is basic. Because if the solution has pH more than 7 it will be base and pH less than 7 it will be acid.
7. Why do people use antacids during indigestion?
During indigestion stomach produces more acid. This causes pain or irritation in the stomach. By taking antacids like magnesium hydroxide or baking soda the acid neutralizes and reduces pain.
8. Why do dentists suggest basic toothpaste?
Bacteria in our mouth produces acids. It causes tooth decay. By using basic toothpaste we can neutralize the acid and reduce tooth decay.
9.what is the reason for the acidity of soil and how can we correct it?
Acidity of the soil is due to acid rain. 1 can be controlled by adding chalk powder or organic compounds or quick lime to the soil.
10. What is acid rain? What are its effects?
If the pH of rain water decreases below 5.6 it is called acid rain. If this water mixes with rainwater it affects the survival of aquatic life.
11. Why should we be very careful while adding acid or base to the water?
We should add acid or bases to the water by continuous stirring. Because the heat produced may splash the mixture. This may cause burns or cracking of glass wares.
12. We should not store curd are sour substances in copper or brass vessels why?
They contain acids. They will react with the vessels to form poisonous products.so we should not store curd in copper or brass vessels.
Note: practice diagrams 2.1 and 2.3

Chapter 4 carbon and its compounds

1. **Define the following**

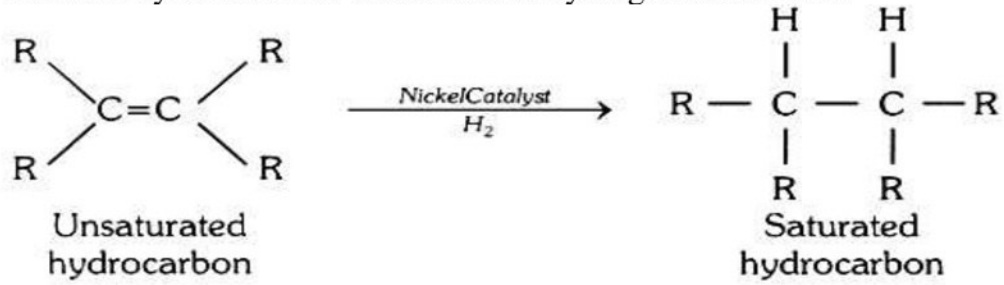
Covalent bonding Bond formed by sharing of valence electrons between atoms	**Catenation** Ability of carbon to form bonds with other atoms of carbon to give large molecules.
Structural isomers Compounds have same molecular formula   but different structures.	**Homologous series** A group of carbon compounds with CH_2 difference between two successive members.

2. Write the differences between saturated and unsaturated hydrocarbons

Saturated hydrocarbons	Unsaturated hydrocarbons
1. All the carbon atoms are bounded by single bonds. 2. They are less reactive. 3. They burn without smoke.	1. A double or triple bond is present in the hydro carbon chain 2. They are more reactive. 3. They burn with smoke.

3. How can we convert saturated hydrocarbons into saturated hydrocarbons

Heating unsaturated hydrocarbons with hydrogen in the presence of nickel/ palladium catalyst gives saturated hydro carbons. Kis is used in hydrogenation of oils.



4. Explain the oxidation reaction of hydrocarbons with one example

Heating ethanol with 5% solution alkaline $KMnO_4$ or acidified $K_2Cr_2O_7$ Ethanoic acid is obtained.

$$CH_3CH_2OH \xrightarrow{\text{ALK KMNO}_4\text{/ACIDIFIED K}_2\text{Cr}_2\text{O}_7} CH_3COOH + 2H_2O$$

5 write the differences between

1. **soaps and detergents**
2. **Hard water and soft water**

Soap	Detergents
They are the sodium salts of carboxylic acids. They clean only in soft water.	They are sodium salts of sulphonic acid. They clean in both hard and soft water.

Hard water	Soft water
It does not give foam easily with soap as it has calcium and magnesium salts forming scum.	It gives foam easily without forming scum with soap.

6. Explain the cleaning action of soap.

When dirty clothes are treated with soap it forms micelles. The hydrocarbon end attaches itself to dirt. After rinsing with water the ionic end of the micelle attaches to water. So the dirt with soap micelle is carried away by water.

7. Why do we need more water to clean in hard water.

Hard water as calcium and magnesium salts. They will act with soap to form scum. So we need more soap to clean in hard water.

Note: practice the molecular formula and structural formula of alkanes alkenes alkynes cycloalkanes and benzene.

Biology

6. Life Processes

1) Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds?

Warm-blooded animals such as birds and mammals maintain a constant body temperature by cooling themselves when they are in a hotter environment and by warming their bodies when they are in a cooler environment. Hence, these animals require more oxygen (O_2) for more cellular respiration so that they can produce more energy to maintain their body temperature. Thus, it is necessary for them to separate oxygenated and de-oxygenated blood, so that their circulatory system is more efficient and can maintain their constant body temperature.

2) How are water and minerals transported in plants?

Ans : The components of xylem tissue (tracheids and vessels) of roots, stems, and leaves are interconnected to form a continuous system of water-conducting channels that reaches all parts of the plant. Transpiration creates a suction pressure, as a result of which water is forced into the xylem cells of the roots. Then there is a steady movement of water from the root xylem to all the plant parts through the interconnected water-conducting channels.

3) How is food transported in plants?

Ans : Phloem transports food materials from the leaves to different parts of the plant body. The transportation of food in phloem is achieved by utilizing energy from ATP. As a result of this, the osmotic pressure in the tissue increases causing water to move into it. This pressure moves the material in the phloem to the tissues which have less pressure. This is helpful in moving materials according to the needs of the plant. For example, the food material, such as sucrose, is transported into the phloem tissue using ATP energy.

4) Describe the structure and functioning of nephrons.

Ans : Structure of a nephron : Nephrons are the basic filtering units of kidneys. Each kidney possesses large number of nephrons, approximately 1-1.5 million. The main components of the nephron are glomerulus, Bowman's capsule, and a long renal tubule.

Functioning of a nephron:

The blood enters the kidney through the renal artery, which branches into many capillaries associated with glomerulus. many capillaries associated with glomerulus.In the proximal tubule, some substances such as amino acids, glucose, and salts are selectively reabsorbed and unwanted molecules are added in the urine.The filtrate then moves down into the loop of Henle, where more water is absorbed. From here, the filtrate moves upwards into the distal tubule and finally to the collecting duct. Collecting duct collects urine from many nephrons. The urine formed in each kidney enters a long tube called ureter. From ureter, it gets transported to the urinary bladder and then into the urethra.

5) What are the methods used by plants to get rid of excretory products?

Plants can get rid of excess of water by transpiration. Waste materials may be stored in the cell vacuoles or as gum and resin, especially in old xylem. It is also stored in the leaves that later fall off.

6) What are the functions of valves of heart?

Valves allow the blood to flow in single direction.

7) What are the functions of platelets?

Ans : Platelets help in clotting of blood.

8) Mention is the function of lymph.

Ans : Lymph helps in body defence.

9) Name the structural and functional units of kidneys.

Ans : Nephrons

10) Which are the steps of urine production in human beings?

Ans : Glomerulus filtration, Tubular reabsorption and tubular secreation.

11) Which are the waste substances excreated by plants and animals?

Ans : In plants : Carbon di oxide, oxygen, water, nitrogenous waste substances.
In animals : Carbon di oxide, ammonia, urea, uric acid,gwanin and creyetin.
In human beings : Carbon di oxide, excess water, ammonia, urea, uric acid.

12) What are the problems caused by the deficiency of haemoglobin?

Ans : Deficiency of haemoglobin in blood can affect the oxygen supplying capacity of blood. This can lead to deficiency of oxygen in the body cells. It can also lead to a disease called anaemia.

13) Why are there chambers in the heart?

Ans : Oxygen and carbon di oxide have to be transported by the blood. To prevent the oxygen rich blood from mixing with the blood containing carbon di oxide.

14) **What prevents backflow of blood inside the heart during contraction?**

(a) Valves in heart (b) Thick muscular walls of ventricles
(c) Thin walls of atria (d) Septum membrane

15) Choose the correct statement that describes arteries.

(a) They have thick elastic walls, blood flows under high pressure; collect blood from different organs and bring it back to the heart

(b) They have thin walls with valves inside, blood flows under low pressure and carry blood away from

the heart to various organs of the body.

(c) They have thick elastic walls, blood flows under low pressure; carry blood from the heart to various organs of the body

(d) They have thick elastic walls without valves inside, blood flows under high pressure and carry blood away from the heart to different parts of the body.

Ans : (d) They have thick elastic walls without valves inside, blood flows under high pressure and carry blood away from the heart to different parts of the body.

7. Control and coordination

1.Write the general scheme of how nerve impulses travel in the body.

Receptors(chemical impulses) ---→ dendrites (electrical impulses) --→cell body ---→ axon ---→nerve ending(chemical impulses) ---→ dendrites.

2. What is reflex action? Give example

A sudden reaction to the the particular action in our environment is called reflex action. Example -withdrawing our hands after touching a hot object.

3. Write the sequence of the events that take place during reflex action.

Receptor --→ sensory neuron---→ relay neuron ---→ motor neuron ---→ effector (muscles).

4. Write the functions of the following parts of human brain.

a. Fore brain(cerebrum): helps to understand the information received by sensory organs. It is the thinking part of our brain.

b. Medulla: controls involuntary actions like blood pressure, salivation and vomiting.

c. Cerebellum: it is responsible for precision of voluntary activities and maintaining the posture and balance of the body. Example bicycle riding, walking and picking up a pencil e.t.c.

5. Name different tropic movements in plants and give examples.

i. Phototropism: light stimulated movement. Example - bending of stem towards light, bending of roots away from light.

ii. Geotropism: growth due to gravity. Example – upward growth of shoots and downward growth of roots.

iii. Hydrotropism: water stimulated movement. Example: roots growing towards water.

iv. Chemotropism: growth stimulated by chemicals. Example - growth of pollen tube towards the ovary.

v. Thigmotropism: growth stimulated by touch Example- growth of tendrils

6. List about the important endocrine glands, their secretion and their function.ormones in animals:

S.N	ANIMAL HORMONE	ENDOCRINE GLAND	FUNCTION
1.	Growth hormone	Pituitary	Stimulates growth in all organs.
2.	Thyroxin	Thyroid	Regulates metabolism for body growth.
3.	Insulin	Pancreas	Regulates blood sugar level.
4.	Testosterone	Testis	Development of male sex organs.
5.	Estrogen	Ovary	Development of female sex organs.
6.	Adrenaline	Adrenal	Co ordinates respiration heart beat during emergency.
7.	Releasing hormone	Hypothalamus	Stimulates pituitary gland to release hormones.

6. Name some plant hormones and write their functions.

a. Auxins- increase the length of the cell

b. Gibberellins - Helps in growth of stem.

c. Cytokinins-Promotes cell division in rapid growing parts like fruits and seeds.

d. Abscisic acid - inhibits growth, ex- wilting of leaves.

7. Why should we use iodized salt in our diet?

Iodine helps the proper secretion of thyroxine hormone. This hormone regulates our metabolism. If iodine level decreases it causes goitre.

8. **What is the reason for the irregular sugar level in our blood and how can we control it?**

Irregular sugar level in our blood is due to the decrease in the insulin hormone. This condition is called diabetes. It can be controlled by taking proper quantity of insulin.

9. What is the effect of deficiency of pituitary hormone in puberty?

Deficiency of pituitary hormone in puberty causes dwarfism.

10. Explain, how these movements take place in plants.

a. Closing of touch me not leaves: The change in the water level of the cells causes wilting

b. Growing of tendrils around the support: The region which is away from the support. So tendrils grow long and holster support.

c. Bending of shoots is towards light: Auxin increases in shady region. Shoot of that side gross long and bends towards light.

11. How does our body respond during adrenaline secretion.

During adrenaline secretion breathing rate increases and heartbeat also increases. This increases the blood flow in muscles and supplies more oxygen to work faster.

Note: practice diagrams 7.1a and 7.3

8. Reproduction in Living Organisms

One mark Questions

1. What is reproduction?

The ability of an organism To create a new organism which looks like themselves is called reproduction.

2. What is Pollination?

Pollination is the process of transfer of pollen from anchor to stigma.

3. List two agents of pollination

The agents of pollination are - air, water, birds, insects & bat

4. What is Fertilization

Fertilization is the process of fusion of male and female gametes

5. Name the special tissue which nourishes the Embryo in the mother's womb.

The special tissue which nourishes the embryo in the mother's womb is -Placenta

6. List two secondary sexual characters of males that are different from that of females.

The secondary sexual characters of males that are different from that of females are - development of moustache and their voices begin to crack.

7. **Give an example of a flower which contains both stamens and carpels**.

Flower which contains both stamens and carpels- Hibiscus, Mustard.

8. What are unisexual flowers?

Flowers in which either carpels or anthers are present are called unisexual flowers.

9. What are bisexual flowers?

Flowers in which both carpels and anthers are present are called unisexual flowers.

10. How do Variations occur?

Errors during replication of DNA cause variations.

11. How are variations useful?

Variations are useful for ensuring the survival of the species.

12. **Name the hormones that are released in females when they reach puberty.**

The hormones that are released in females when they reach puberty are Estrogen and progesterone.

13. Name the hormones that are released in males when they reach puberty.

The hormones that are released in males when they reach puberty Tesstosterone.

14. Give examples for flowers that have both carpels and stamen.

An example of a flower which contains both stamens and carpels is Hibiscus, Rose, Mustard.

15. Why are testes located outside the abdominal cavity in the scrotum? Mention the functions of hormones secreted by it?

The testes are located outside the abdominal cavity because sperm formation requires a lower temperature than the normal body.

2 mark Questions

10. Why does menstruation occur?

A period/menstruation happens because of changes in hormones in the body. The ovaries release the female hormones estrogen and progesterone . These hormones cause the lining of the uterus (or womb) to build up. When there is no fertilization of egg This lining of uterus falloff and causes menstruation.

11. What is the role of the seminal vesicles and prostate glands?

The prostate glands and seminal vesicles Secrete fluid for easy transport of sperms and provides nutrition to them.

12. **What are the advantages of sexual reproduction over asexual reproduction?**

Sexual reproduction	Asexual reproduction
1. Two individuals are involved	1. only individual is involved
2. Variations are seen	2. Variations are not seen
3. offspring's are different from parents	3. offspring's are same as parents.

13. **List the changes that occur in flower after fertilization?**

The changes that occur in the flower after the fertilization are-

a. The ovule is converted to seed

b. The ovary becomes fruit.

c. The petals, staples, stamens, style and stigma shrivel and fall off.

14. Differentiate between self-fertilization and cross fertilization?

Self-fertilization	Cross fertilization
When pollen of the same flower fertilize the egg cell of the same flower, then it is called as self fertilisation	When pollen of the flower fertilizes the egg cell of another flower of different plant of the same type, it is called cross fertilisation.
Less variation is seen.	More variation is seen.

15. Write a difference between 'gamete' and 'zygote'

Gamete	Zygote
1. Gamete is formed by the division of nucleus	1. Zygote is formed by the fusion of nuclei of 2 gametes

2. Gamete has only 1 set (haploid) of chromosomes	2. Zygote has 2 sets (diploid) of chromosomes

16. If pollination does not take place , fertilization will not take place. Give reason

Fertilization requires both male and female gametes. So, it is necessary that the male gamete reaches the female gamete. Hence, fertilization cannot take place in flowers if pollination does not occur due to absence of pollen

17. Differentiate between self-pollination and cross-pollination in flowers

self-pollination	cross-pollination
1. The transfer of pollen from anther of flower to the stigma of the same flower is called self pollination	1. The transfer of pollen from anther of one flower to the stigma of the another flower is called cross pollination
2. Self pollinating flowers show less variation	2. Cross pollinating flowers show more variation

21. How does the embryo get nourishment inside the mother's body?

Embryo gets the nourishment from mother By a special tissue called placenta. It connects mother and child And supplies nutrition and oxygen to growing embryo.It also helps to remove waste products generated by embryos.

22. If a woman is using copper-T, will it help in protecting her from sexually transmitted diseases?

No, use of copper-T will not provide Will a protection from sexually transmitted diseases. Because it does not prevent the entry of Semen. It only prevents the implantation of embryo in the uterus.

23. What are the functions performed by the testis in human beings?

Tests are male reproductive organs, its functions include

- To produce sperms.
- Secrete hormone called Testosterone, That brings about secondary Sexual characters in boys.

24. List out the differences between male and female gametes?

Male gamete	Fe-male gamete
• Male gametes are motile.	• Female gametes are immotile.
• Male gametes are many and smaller in size	• Female gametes are single and larger in size

25. What are sexually transmitted diseases? Give examples

The diseases caused during sexual contact are called sexually transmitted diseases. Example-
Bacterial diseases - Gonorea, Syphilis,
Viral diseases – Warts and HIV-AIDS

26. To which category of diseases AIDS belong? Name the causative organism

AIDS belongs to the category of sexual diseases. The causative agent is HIV (Human Immunodeficiency Virus)

28. What is pre-natal sex determination? Why is it banned?

The process of determining sex of a child before birth is called pre-natal sex determination. The male to female ration in the country is less. To reduce this gap and also to save the girl child the pre-natal sex determination is banned.

29. **Why are testes located outside the abdominal cavity in the scrotum? Mention the functions of hormones secreted by it?**

The tests are located outside the abdominal cavity because sperm formation requires a lower temperature than the normal body.

Testis produce male reproductive hormone called Testosterone, it helps

- To produce sperms.
- Secrete hormone called Testosterone, that brings about secondary Sexual characters in boys.

30. Draw the diagram showing the germination of pollen on stigma and label the pollen tube(2)

31. Draw a labelled diagram of typical flower. (2)

3 Mark Questions

32. **In a germinating seed, which parts are known as future shoot and future root? Mention the function of cotyledon. (3)**

In a germinating seed plumule is called the future shoot And radicle is called the future root. The cotyledons store the food that would help the seed to overcome unfavorable conditions.

33. What is sexual reproduction? List its four significance. (3)

Sexual reproduction is a type of reproduction which occurs by the fusion of gametes by male and female sexes.

The advantages of sexual reproduction include

- Induces variation in a population.
- Every time new individuals with new characters are produced.
- Maintains the chromosome number of the species by meiotic division.
- During the course of evolution may lead to speciation

34. What are the changes seen in girls at the time of puberty?

The changes that are seen in girls At the time of puberty are

- Increase in breast size and darkening of nipples.
- Appearance of hair in genital area, under arms, face, hands and legs.
- Increase in size of uterus and ovaries.
- Beginning of menstrual cycle.
- Secretion of oil in skin, which results in pimple formation.

35. What are the changes seen in boys at the time of puberty?

The changes that are seen in girls At the time of puberty are

- Appearance of hair in genital area, under arms, face, hands and legs.
- Secretion of oil in skin, which results in pimple formation.
- Thick hair growth on face.
- Their voices begin to crack.
- Penis occasionally becomes enlarged and erect.

36. What could be the reasons for adopting contraceptive methods?

Contraceptive methods are mainly adopted because of the following reasons:

1. To prevent unwanted pregnancies.
2. To control population rise or birth rate.

3. To prevent the transfer of sexually transmitted diseases.

37. Explain the structure and functions of placenta?

Placenta is a special tissue present in the uterine wall of the mother. It contains on the embryo side many villi. On the mothers side are blood spaces which surround the villi. The presence of villi provides a large surface area for glucose And oxygen to pass from mother to the embryo.

Placenta helps the embryo to get nutrition and oxygen from mother. It also helps to remove waste products generated by the embryo.

38. What is contraception? Mention the different contraceptive methods. Which among them is the best method?

The method that avoids pregnancy is called contraception.

The different contraceptive methods are-

a. Natural method - Avoiding sexual contact
b. Barrier method - Use of barriers like condoms during sex.
c. Oral contraceptives - Tablets, to prevent fertilisation.
d. Implants - Like cooper -T placed in the uterus to avoid pregnancy.
e. Surgical methods-

i) Vasectomy- In males where vas deferens is blocked To prevent transfer of sperms.

ii) Tubectomy- fallopian tubes of females are blocked So that egg will not reach uterus.

The best method is the barrier method, since in other method there is a risk of pregnancy, side effects and infections.

4/5 Marks Questions

39. Mention the function of ovary, oviduct and uterus in the female reproductive system. How essential materials are supplied for the development of the fetus?

Ovary - to produce eggs, that are required during fertilisation.

Oviducts - helps in providing a suitable surrounding for fertilisation and in transporting the sperms towards egg during copulation.

Uterus - helps in nurturing the fertilised egg/embryo.

Vagina- helps in the entry of sperms

The essential materials are supplied for the development of fetus by a special tissue called Placenta.

40. Explain the significant function of each structure in human male reproductive system

Testes - produces sperms and secretes testosterone to regulate the secondary sexual characters in boys

Vas deferens - Deliver sperms to urethra

Prostate glands and seminal vesicles- secrete fluid for easy transport of sperms and provides nutrition

Penis- helps in the ejaculation of sperms to female body.

9. Heredity and Evolution

1 What is Heredity?

Heredity is the transmission of characters or traits from the parents to their offspring.

2. What is Variation?

Variation is the difference in the characters or traits among the individuals of a species.

3. What is Evolution?

It is the sequence of gradual changes which take place in the primitive organisms over

millions of years in which new species are produced.

4. Why Mendel chose pea plants for his experiments?

- Pea plants can grows in pots and on land easily.
- Pea plants have very short life cycle.
- It can produce more number of seeds.
- It produce bisexual flowers which undergo self & cross pollination.
- It shows more number of characters(traits) which can easily inherited.

5. What are the differences between Inherited Traits and Acquired Traits?

Inherited Traits	Acquired Traits
-These are somatic variations.	-These are genetic variations.
-Acquired traits develop due to the effects of environmental factors, use and disuse of organs and special (conscious) efforts.	-Inherited traits develop due to reshuffling of genetic material and mutations.
-These traits develop throughout the lifetime of an individual and die with the death of that individual.	-These traits are transferred(inherited) by the parents to their offspring. These do not die but are passed on to the next generation.
-Example—Learning of dance, music, etc, and muscular body of a wrestler.	-Example—Attached or free earlobe and curly hair.

Three Mark Questions

6. What is Mendel's Monohybrid Cross? Explain.

A cross made between two plants having one pair of contrasting character is called monohybrid cross.

* Mendel first crossed pure bred tall pea plants with pure bred dwarf pea plant and found that only tall pea plants were produced in the first generation (F1).

*Mendel then crossed the tall pea plants of the Ist generation (F1) and found that both tall plants and dwarf plants were obtained in the second generation (F2) in the ratio 3:1 i.e., 3/4 tall and 1/4 dwarf plant (monohybrid ratio).

7. State laws of Mendel.

Mendel's law-

(a) **Principle of segregation(Monohybrid cross)** – two factors of a character are separated at the time of gamete formation and each gamete get only one factor for that character.

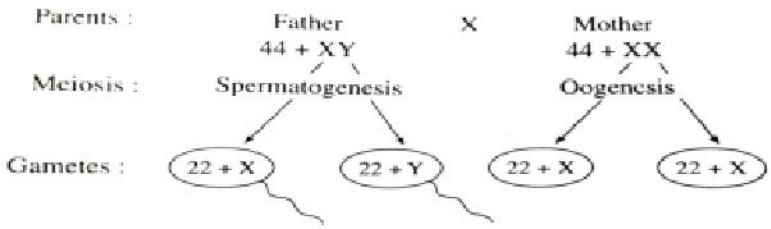
(b) **Principle of independent assortment (Dihybrid cross)-** this principle states that inheritance of two or more pair of contrasting traits is such a way that one pair of contrasting traits is independent of the other pair of contra sting traits.

8. How is the sex of a child determined in human beings?

A male germinal cell which forms gametes carries one X and one Y-chromosome while a female germinal cell carries only XX-chromosomes.

* Therefore, sex of the child depends upon what happens during fertilization.
* If a sperm carrying X-chromosome fertilizes the egg, the child born will be female (XX).
* If a sperm carrying Y-chromosome fertilizes the egg, the child born will be male (XY).

* Thus, the sperm (the male gamete) determines the sex of the child.



On crossing:

Gametes	22 + X	22 + X
22 + X	44 + XX Daughter	44 + XX Daughter
22 + Y	44 + XY Son	44 + XY Son

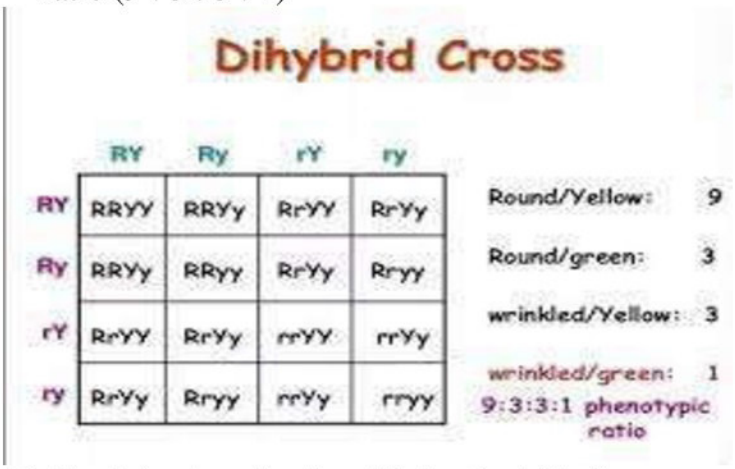
Four/Five Mark Questions

9. Explain how Mendel showed that genes determining 2 different character assort independently.

A cross made between two plants having two pairs of contrasting character is called dihybrid cross.

Mendel considered shape as well as colour of seeds simultaneously.

Mendel crossed a variety of pea with round, yellow seeds with another variety having wrinkled green seeds, the F1 progeny showed only round yellow seeds. After self-fertilisation of F1 plants, the F2 progeny obtained, showed four different types of plants having seeds in a ratio 9 (round, yellow) : 3 (round, green) : 3 (wrinkled, yellow) : 1 (wrinkled, green). This is called a dihybrid ratio (9 : 3 : 3 : 1)



10. Explain Acquired and Inherited Traits

There are 2 kinds of traits in every organism.

(*i*) **Inherited traits.** These traits are controlled by specific genes and are passed on from one generation to another. Any alteration in the DNA will be passed on, through germ cells, to progeny resulting in variations in them.

(*ii*) **Acquired traits.** Certain traits are acquired by organisms in their life time. For instance, decrease in the body weight of beetles due to starvation is an acquired trait by the beetles during their life time. It involves changes in the non-reproductive tissues caused by environmental factors. It will not bring any change in the DNA. Therefore, even if some of the generations of beetle are low in weight because of starvation, this trait cannot be inherited by the progeny over generations.

11. The important factors which leads speciation are the following:

(*i*) Geographical isolation of a population caused by various types of barriers (such as mountain ranges, rivers and sea). The geographical isolation leads to reproductive isolation due to which there is no flow of genes between separated groups of population.

(*ii*) Genetic drift caused by drastic changes in the frequencies of particular genes is by chance alone.

(*iii*) Variations caused in individuals due to natural selection.

12. What are the different ways in which individuals with a particular trait may increase in a population?

The different ways in which individuals with a particular trait may increase in a population are following:

*** Food availability** – Individuals with a particular trait may have extra abundance of food in their environment. They will naturally increase in number.

- **Genetic drift** – Individuals with a particular trait may increase in a population due to genetic drift. In it, there is a seasonal or accidental decline in population. The survivors have certain combination of traits which increase in number with increase in population.
- **Natural selection** – The particular trait which has survival value is picked up by natural selection. It increases in population through differential reproduction.

13. What are fossils? What do they tell us about the process of evolution?

Fossils are the remains or traces and impressions of any organism that lived in the geological past. Fossils provide a direct evidence of evolution and are called written documents of evolution. They directly indicate the presence of different types of organisms in different ages. The path of evolution is known by arranging the fossils in a proper sequence age wise. The early fossils are the simple organisms. Later on different complex forms arose, flourished and died down. They are replaced by newer forms.

14. What are the different methods used to study fossils?

- **Relative method**: One is relative. If we dig into the earth and start finding fossils, it is reasonable to suppose that the fossils we find closer to the surface are more recent than the fossils we find in deeper layers.
- **Carbon dating method:** The second way of dating fossils is by detecting the ratios of different isotopes of the same element in the fossil material.

15. Mention two important features of fossils which help in evolution.

(a) Fossils provide direct evidence of evolution.

(b) Fossil records also provide missing links between two groups of organisms,

For example- Birds and Archaeopteryx. called written documents of evolution.

16. Give a suitable explanation for "geographical isolation of individual of a species lead to formation of a new species?

Reproduction barrier such as river (geographical isolation) between the sub population
Leading to:

(a) Genetic drift or random changes in the gene frequency by chance alone e.g. selection of red or blue beetles instead of green in presence of crows.

(b) Natural selection or selection of the fittest by nature itself eg. Selection of green beetles instead of red ones in the presence of crows.

17. How has the method of artificial selection by humans helped in the evolution of different vegetables? Explain in brief giving an example.

Humans have developed different varieties of vegetables from a single wild cabbage by artificial selection some of these are as follows —

(i) Some farmers have wanted to select very short distances between the leaves and developed the cabbage.

(ii) Some farmers selected immature green flowers and developed the broccoli.

(iii) Some have selected the sterile flowers and developed the cauliflowers.

(iv) Some farmers selected the swollen part of the wild cabbage and developed the kohlrabi.

(v) Some of them have selected the larger leaves and developed Kale.

a common So all these vegetables are descended from ancestor.

18. Feather imprints were preserved along the dinosaur's bones but dinosaurs could not fly. What was the significance of feathers in reptiles and later on for other species?

It is believed that feathers in dinosaurs might have provided insulation in cold weather but later on became useful for flights in birds.

19. How does Archaeopteryx provide evidence for organic evolution?

Archaeopteryx has some features of reptiles, characters of dinosaurs as well as some features of birds like wings. This shows that birds are closely related to reptiles. Birds could evolve from reptiles.

20. **Explain the importance of fossils in deciding evolutionary relationships.**

Fossils help us to know the following:

(a) Fossils help to trace the racial history of organisms.

(b) They help to measure the geological time.

(c) Older fossils lie at the depth and young fossils are at the upper surface of the earth. Complex organisms are present at top and simple organisms are present at the bottom.

(d) Fossil like—Archaeopteryx-show the link between two different types of species.

21. Who is known as the ''father of Genetics''?

G.J. Mendel is called the ''father of Genetics''.

22. What is evolution?

Evolution is the sequence of gradual changes which take place in living organisms over millions of years to give rise to new species.

23. Name the scientist who put forth the theory of natural selection.

The scientist who put forth the theory of natural selection is Charles Darwin.

24. What are homologous organs? Explain with an example.

Homologous organs are those organs which have the same basic structural design and origin but may have different functions.

Example- hand of human and fore-limb of frog.

25. What are analogous organs? Explain with an example.

Analogous organs have the same function but have different structural design and origin. For example, wings of birds and insects have the same function but have different structural design and origin.

26. Which of the following are homologous and analogous organs?

(a) Wings of birds and insects. (b) Flippers of whale and fins of fish.
(c) Flippers of whale and wings of bat. (d) Our teeth and elephants tusks.
(e) Potato and runners of grass.

Ans. (a) — Analogous organs
(b) — Analogous organs
(c) — Homologous organs
(d) — Homologous organs
(e) — Homologous organs.

27. What is genetic drift?

Accidents in small populations can change the frequency of some genes in a population even if they give no survival advantage. This is genetic drift, which provides diversity without any adaptations. So, it is the random change in the frequency of alleles in a population over successive generation.

28. Which is gene flow?

Ans. It is the exchange of genetic material by interbreeding between populations of the same species. Gene flow increases the variations in a population.

29. Define Genetics.

Ans. The science which deals with the study of heredity and variation is called Genetics.

30. How are the areas of study of evolution and classification interlinked?

* The study of classification of various organisms gives us an idea about the evolutionary history of organisms. Organisms, which have certain similar characteristics are placed in one group.
* It can be thus concluded that the organisms placed in one group may have evolved from common ancestors and may have a common evolutionary history.

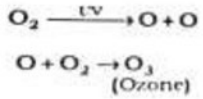
31. Explain Human Evolution?

All have beings belong to single species Homo sapiens, although there were many races of humans. They have originated in Africa, some ancestors left Africa and migrated to West Asia, Central Asia, Eurasia South Asia, East Asia, Indonesia, Australia, America, while others stayed there.

Excavating, time-dating, studying fossils, determining DNA Sequences have been used for studying human evolution.

15. Our environment

1.How ozone is formed?



2.Why do we need ozone?

Ozone protects our earth from harmful ultraviolet radiation from the sun

3.What causes ozone depletion:

Chlorofluorocarbons used in refrigerants and fire extinguishers liberates chlorine due to u.v radiation. This chlorine split ozone and causes depletion.

4. What are the effects of ozone depletion?

Harmful U.V radiation enters earth and causes skin cancer in humans.

4. **Suggest measures to control ozone depletion .**

Manufacturing and using CFC free refrigerators and fire and aerosols

6.Differentiate between biodegradable and nonbiodegradable waste.

Biodegradable waste

1. They can be converted in to harmless form by treatment.
2. They remain for short time
3. ex – carbon dioxide, sewage, paper, leather

Nonbiodegradable waste:

1.They cannot be converted in to harmless form by any treatment
2. They remain for longtime or forever.
3. ex – plastic, glass, metal**,**

7.List out some steps to manage waste?

1. Produce less waste, 2. Separate biodegradable and non biodegradable materials, 3.make compost or biogas from biodegradable wastes, 4. Reuse or repurpose or recycle non biodegradable waste.

8.What are the advantages of waste management:

1. Clean surroundings 2. Decrease in amount of waste. 3. Prevention of soil pollution 4. Control spread of communicable diseases by insects and rats. 5. Production of manure, biogas, electricity from waste**.**

9.Name some environment friendly practices

1. Carry cloth bags for shopping, 2. Use less water and electricity, 3.prefer walking and use of bicycles and public transport, 4.segregate wastes.

10. Non-biodegradable wastes can not be decomposed by microbes. Why?

Microbes do not have enzymes to degenerate non-biodegradable wastes

16. Sustainable Management of Natural Resources

1) In view of nature conservation what do you mean by 'repurpose'.

Ans : This means when a product can no more be used for the original purpose, think carefully and use it for some other useful purpose.

2) 'Reuse' and 'Recycle' which of them is best? Why?

Ans : Reuse the is best. Because the process of recycling uses some energy. In the 'reuse' strategy, you simply use things again and again.

3) State the meaning of 'Sustainable management'.

Ans : Sustainable management is controlling the use of resources in such a way as to provide for its equitable and continuous availability to the present generation as well as for future generations without any harmful impact on the environment.

4) Which method do you choose to manage sustained in the environment in the following situations of daily life

a) Water during brushing of teeth c) empty glass bottles

b) Plastic bag given by shopkeeper d) broken plastic bucket

Ans: a) Reduce b) Refuse c) Reuse d) Repurpose

5) Reuse of plastics is more useful method than recycling. Why?

Ans: Reuse is best. Because the process of recycling uses some energy. In the 'reuse' strategy, you simply use things again and again.

6) The bacteria found in the intestine of humans is

a) Coliform b) Rhizobiumc)Azatobacter d) Streptococci

Ans : a) Coliform

7) Ganga Action Plan is taken by the Govt in which year and why?

Ans : Ganga Action Plan came about in 1985 because the quality of the water in the Ganga was very poor.

8) A student argues that for sustainable management of resources, reuse, recycle and reduced use are very important. If you agree with his statement support with correct reasons.

Ans : **Reuse** Instead of throwing away used envelopes, you can reverse it and use it again. The plastic bottles in which you buy various food-items like jam or pickle can be used for storing things in the kitchen.

***Recycle** : This means that you collect plastic, paper, glass and metal items and recycle these materials to make required things instead of synthesising or extracting fresh plastic, paper, glass or metal.

*__Reduce__ : You save electricity by switching off unnecessary lights and fans. You save water by repairing leaky taps. Do not waste food.

9) **What changes can you make in your habits to become more eco-friendly?**

*Stop wastage of water.

* Switching off unnecessary lights and fans.

* Don't waste food. Take as much as you require.

* Walking down or use cycle for going to nearby market instead of using vehicle. * Separate wastes into recyclable and non-recyclable.

* Reuse carry bags, packing materials, plastic containers and other reusable material.

10. Who are stake holders? Which among them these should have the authority to decide the management of resources of forest produce? Why do you think so?

*The people who live in or around forests and are dependent on forest products for various aspects of life.

*The forest department that owns the land and controls the forest resources and their produce.

* The wildlife and nature- enthusiasts who want to conserve nature in its original form as far as possible.

* The owners for industries like paper , Who take the materials only up to their needs from the forest resources and try to replenish these resources.

11. **Local people are the stake holders of the forest? Explain**.

The local people need large quantities of firewood, small timber and thatch. Bamboo is used to make slats for huts, and baskets for collecting and storing food materials. Implements for agriculture, fishing and hunting are largely made of wood, also forests are sites for fishing and hunting. In addition to people gathering fruits, nuts and medicines from the forests, their cattle also graze in forest areas or feed on other fodder which is collected from forests.

12) 'Natural resources should be used cautiously' Why? Explain.

Ans : Because the resources are not unlimited and with the human population increasing at a tremendous rate due to improvement in health-care, the demand for all resources is increasing at an exponential rate.

13) Mention two causes of over-exploitation of natural resources.

Ans : 1) Population explosion 2) Over use of natural resources.

14) "We need to manage our resources." List two reasons to justify this statement.

Ans : Because the resources are not unlimited and with the human population increasing at a tremendous rate due to improvement in health-care, the demand for all resources is increasing at an exponential rate.

15. Why should we conserve forest?

Forests are "biodiversity hotspots". A wide range of different life forms — bacteria, fungi, ferns, flowering plants, nematodes, insects, birds, reptiles, etc. are present in a forest. One of the main aims of conservation is to preserve the biodiversity we have inherited.

17. For what purpose National award is given on the memory of Amruthadevi Bishnoy?

Ans : The Government of India has recently instituted an 'Amrita Devi Bishnoi National Award for Wildlife Conservation' in the memory of Amrita Devi Bishnoi, who in 1731 sacrificed her life along with 363 others for the protection of 'khejri' trees in Khejrali village near Jodhpur in Rajasthan.

18. 'Construction of dams causes problems'. Explain.

Ans : (i) **Social problems** : Due to construction of high rise dams, a vast area of land getssubmerged under water resulting in displacement of large number of people. Thesedisplaced people do not get adequate compensation or rehabilitation.

(ii) **Economic problems**: The construction of high-rise dams involves spending of huge amount of public money and the benefits generated by these projects are not proportional to the expenditure.

19. What is the main aim of Forest and Wildlife conservation?

Ans : Reasons for conserving –

(a) **Forests** :-

(i) To preserve the biodiversity we have inherited.

(ii) To increase the economical benefits.

(b) **Wildlife** :-

(i) To make a balance in ecosystems.

(ii) To preserve the rare species of plants and animals.

20. "Forests are biodiversity hotspots" Justify or What are "biodiversity hot spots"? What is the measure of the biodiversity?

Ans : Forests are 'biodiversity hotspots'. One measure of the biodiversity of an area is the number of species found there. However, the range of different life forms (bacteria, fungi, ferns, flowering plants, nematodes, insects, birds, reptiles and so on) found, is also important. One of the main aims of conservation is to try and preserve the biodiversity we have inherited. Experiments and field studies suggest that loss of diversity may lead to loss of ecological stability.

21. Suggest some approaches towards the conservation of forests?

Ans : Conservation of Forests : Some approaches are –

(i) Afforestation and reforestation.

(ii) Commercial forestry should be separated.

(iii) Laws can be made for conservation of forests.

(iv) Controlled grazing.

(v) Checking on fire and cutting of trees.

(vi) Building of national parks, sanctuaries and biosphere reserves.

22. Mention one major effect due to deforestation?

Ans : Destruction of biodiversity.

23. Which one of the following stakeholders of forests causes the maximum damage to forest?

i) People who live in or around theforest

ii) The forest department of thegovernment

iii)The wildlife and nativeenthusiasts

Iv] Theindustrialists

Ans : iv) Theindustrialists

24. What are the advantages and disadvantages of construction of dams?

Advantages of Dams:

a) Ensures adequate water for irrigation (sufficient to satisfy need).

b) Generate electricity.

c) Continuous supply of water in regions.

Disadvantages of dams:

a) No equitable distribution of water.
b) Large no. of people displaced without compensation.
c) Involves huge amount of Public money without giving proper benefits.
d) Causes deforestation and loss of biological diversity.

25. Which canal has brought greenery to considerable areas of Rajasthan?

Ans : Khadins

26. Why rain harvested water stored underground has many advantages? OR List out the advantages of water stored in the ground?

Ans: 1. Water does not evaporate when underground.
2. Water spreads to recharge wells.
3. It also provides moisture for the vegetation to survive during dry periods.
4. As water is not exposed, it cannot become breeding ground for mosquitoes.
5. Ground water is also protected from contamination by humans and animal wastes.