

NOTES QUESTIONS

9th Std Science
2nd Term

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9th Standard – Science – Second Term

Notes & Questions

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1. Heat

All substance are made up of molecules. These molecules are in motion and they posses kinetic energy. At the same time the molecules exert force of attraction on one another and they possess potential energy. The sum of the kinetic and potential energy is called internal energy of the molecules. This internal energy, when flows out, is called **heat**.

Heat causes expansion of substances. When heat is added to a substance the molecules gain energy. They vibrate and force other molecules apart. When heat energy is added to a substance its temperature rises. Some objects change in state due to the addition or removal of heat. Thus ice cubes when heated change from solid to liquid state and become water. When water is boiled the liquid state is changed into gaseous state of steam.

Heat transfer takes place in three ways. They are (i) Conduction (ii) Convection (iii) Radiation. The process of transfer of heat in solids from a region of higher temperature to a region of lower temperature without the actual movement of molecules is called **conduction**. Metals are good conductors of heat. In order to cook food quickly cooking utensils are made of aluminum.

When we heat liquids, the liquid at the bottom of the vessel gets heat energy. It becomes light and moves upwards. The cool liquid at the top comes down and gets heat. The flow of heat through a liquid from places of higher temperature to places of lower temperature by movement of the fluid itself is called **convection**. Liquids and gases conduct heat by convection.

Radiation does not require any medium to pass the heat energy. In this method heat is transferred from hot objects in all directions. Radiation can occur even in vacuum. Thus **radiation** is the flow of heat from one place to another by means of electromagnetic waves. The earth gets heat from the sun by radiation.

Temperature is the degree of hotness or coolness of a body. The SI unit of temperature is Kelvin (K). We use Celsius ($^{\circ}\text{C}$) to denote temperature. In Fahrenheit scale the freezing point and boiling point of water are 32°F and 212°F respectively. In Celsius scale it is 0°C and 100°C and in Kelvin scale it is 273.15K and 373.15K . The temperature at which the pressure and volume of a gas theoretically reaches zero is called **absolute zero**.

The amount of heat absorbed or lost by a body is determined by (i) mass of the body (ii) change in temperature of the body and (iii) nature of the material of the body. The **specific heat capacity** of a substance is defined as the amount of heat required to raise the temperature of 1kg of the substance by 1°C or 1K . Water has a highest specific heat capacity and its value is $4200\text{ J/Kg }^{\circ}\text{C}$.

Heat capacity or thermal capacity is the heat energy required to raise the temperature of a body by 1°C . it is denoted by C' . When a substance changes from one state to another, a considerable amount of heat is absorbed or liberated. This energy is called latent heat. **Latent heat** is the amount of heat

energy absorbed or released by a substance during a change in its physical state without any change in temperature.

1. Choose the correct answer:

- Calorie is the unit of
 - heat**
 - work
 - temperature
 - food
- SI unit of temperature is
 - Fahrenheit
 - joule
 - Celsius
 - Kelvin**
- The Specific heat capacity of water is
 - $4200 \text{ J kg}^{-1} \text{ K}^{-1}$**
 - $420 \text{ J g}^{-1} \text{ K}^{-1}$
 - $0.42 \text{ J g}^{-1} \text{ K}^{-1}$
 - $4.2 \text{ J kg}^{-1} \text{ K}^{-1}$
- Two cylindrical rods of same length have the area of cross section in the ratio 2:1. If both the rods are made up of same material, which of them conduct heat faster?
 - both rods
 - Rod-2
 - Rod-1**
 - None of them
- Two cylinders of equal height and radius are made of copper and aluminium. Which of them conducts heat faster?
 - Copper rod**
 - Aluminium rod
 - Both of them
 - None of them
- In which mode of transfer of heat, molecules pass on heat energy to neighbouring molecules without actually moving from their position.
 - Radiation
 - Conduction**
 - Convection
 - Both B and C
- A device in which the loss of heat due to conduction, convection and radiation is minimized is
 - Solar cell
 - Solar cooker
 - Thermometer
 - Thermos flask**

2. Fill in the blanks:

1. The fastest mode of heat transfer is **radiation**
2. During day time, air blows from **sea** to **land**
3. Liquid and gases are generally **slow** conductors of heat.
4. The fixed temperature at which matter changes state from solid to liquid is called **melting point**.
5. A form of energy **Heat**
6. Unit for heat energy **Joule**
7. Hidden heat **Latent**
8. If the mass of substance is mentioned, then heat capacity can be replaced with **SPECIFIC** heat capacity.
9. Process taking place in fluids due to heat exchange **Convection**

3.Assertion and Reason type questions:

- a. If both assertion and reason are true and reason is the correct explanation of assertion.
 - b. If both assertion and reason are true but reason is not the correct explanation of assertion.
 - c. If assertion is true but reason is false.
 - d. If assertion is false but reason is true.
1. Assertion: Food can be cooked faster in copper bottom vessels.
Reason: Copper is the best conductor of heat.
Ans: a. If both assertion and reason are true and reason is the correct explanation of assertion
2. Assertion: Maximum sunlight reaches earth's surface during the afternoon time.
Reason: Heat from the sun reaches earth's surface by radiation.
Ans: c. If assertion is true but reason is false
3. Assertion: When water is heated up to 100°C , there is no rise in temperature until all water gets converted into water vapour.
Reason: Boiling point of water is 10°C .
Ans: c. If assertion is true but reason is false
4. Assertion: Aluminium conducts heat faster than copper.
Reason: Specific heat capacity of aluminium is higher than that of copper.
Ans: d. If assertion is false but reason is true.

4. Short answers questions:

1. Define conduction.

The process of transfer of heat in solids from a region of higher temperature to a region of lower temperature without the actual movement of molecules is called conduction.

2. Ice is kept in a double-walled container. Why?

The double-wall with an insulating material in between is a bad conductor of heat. It prevents heat entering the container from outside. So ice is kept in a double-walled container.

3. How does the water kept in an earthen pot remain cold?

Water in the pot evaporates through the minute holes in the earthen pot. For evaporation it takes heat from the water in the pot. So the temperature of water in the pot decreases and the water remains cool.

4. Differentiate convection and radiation.

In convection heat flows by the movement of the fluid itself but in radiation heat flows by means of electromagnetic waves. Radiation takes place even in vacuum but convection needs matter to pass through.

5. Why do people prefer wearing white clothes during summer?

White surface reflects heat but black surface absorbs it. So people prefer wearing white clothes because they reflect the heat of the sun, without absorbing it.

6. What is specific heat capacity?

Specific heat capacity of a substance is defined as the amount of heat required to raise the temperature of 1 kg of the substance by 1°C or 1K.

7. Define thermal capacity.

Heat capacity or thermal capacity is defined as the amount of heat energy required to raise the temperature of a body by 1°C . It is denoted by C' .

8. Define specific latent heat capacity.

Specific latent heat is the amount of heat energy absorbed or liberated by unit mass of a substance during change of state without causing any change in temperature. The SI unit of specific latent heat is J/kg.

2. Electrical Charge and Electric Current

Electric current is the flow of charges and it consists of moving electric charges. If an electron is removed from an atom, the atom is positively charged. It is called positive ion. If an electron is added in excess to an atom then the atom becomes negatively charged. It is called negative ion. When a plastic comb is rigorously rubbed on dry hair electrons from the hair get shifted to the comb. The comb becomes negatively charged as it gains electrons.

Electric charge is measured in coulomb and its symbol is C. The charge of an electron is equal to $1.6 \times 10^{-19} \text{C}$. There are two types of electric force. One is attractive and the other is repulsive. Like charges repel and unlike charges attract. The force existing between the charges is called **electric force**. Electric field is the region in which a charge experiences electric force.

The electric lines of force are straight or curved paths along which a unit positive charge tends to move in the electric field. **Electric potential** is a measure of the work done on unit positive charge to bring it to that point against all electrical forces. The movement of positive charges is called 'conventional current' and the flow of electrons is termed as 'electron current'.

Current is the rate at which charges flow past a point on a circuit. The standard SI unit for current is ampere with the symbol A. The e.m.f of an electrical energy source is one volt if one joule of work is done by the source to drive one coulomb of charge completely around the circuit. **Resistance** is the measure of opposition offered by the component to the flow of electric current through it. It depends on the geometry of the material and the nature of the material.

Ohm's law states that electric potential difference across two points in an electrical circuit is directly proportional to the current passing through it. A component used for providing resistance is called a resistor. Resistors are two types. One is fixed resistor. The other is variable resistor. One ohm is the resistance of a component when the potential difference of one volt applied across the component drives a current of one ampere through it.

There are two kinds of electrical circuits. In the **series circuit** the components are connected one after another in a single loop. In a **parallel circuit** the components are connected to the e.m.f source in two or more loops. In a series circuit the entire circuit will break if a single device gets fused. But in a parallel circuit the other devices continue to work when one device gets fused. So, parallel circuits are adopted for houses.

When electric current flows in a circuit it exhibits heating effect, chemical effect and magnetic effects. The conversion of electrical energy into heating energy is called **Joule heating**. This principle is used in electric iron, electric stove and electric heaters. Electrical energy is turned into chemical effect in electro plating. The process of conduction of electric current through solutions is called electrolysis. The solution which passes electricity is called electrolyte,

There are two types of current. Direct current flows from a battery. In alternating current the direction of the current varies alternately. The number of complete cycle of variation in one second is called **frequency**. A rectifier is used to convert ac to dc. An inverter is used to convert dc to ac. We use a transformer to vary the voltage of ac current. For safety purpose all metallic electrical devices should be connected to the ground. **Trip switch** is used to cut off excessive flow of current. Fuse is another device to prevent the entry of higher voltage current into a circuit.

I. Choose the correct answer:

1. In current electricity, a positive charge refers to,
a) presence of electron b) presence of proton
c) **absence of electron** d) absence of proton
2. Rubbing of comb with hair
a) creates electric charge b) **transfers electric charge**
c) either (a) or (b) d) neither (a) nor (b)
3. Electric field lines from positive charge and in negative charge.
a) start; start b) **start; end**
c) start; end d) end; end
4. Potential near a charge is the measure of its to bring a positive charge at that point.
a) force b) ability
c) tendency d) **work**
5. In an electrolyte the current is due to the flow of
a) electrons b) positive ions
c) **both (a) and (b)** d) neither (a) nor (b)
6. Heating effect of current is called
a) **Joule heating** b) Coulomb heating
c) voltage heating d) Ampere heating
7. The following is not a safety device.
a) fuse b) trip switch
c) ground connection d) **wire**
8. Electroplating is an example for
a) heating effect b) **chemical effect**
c) flowing effect d) magnetic effect
9. Resistance of a wire depends on
a) temperature b) geometry

- c) nature of material d) all the above
10. In India the frequency of alternating current is
- a) 220 Hz b) 50 Hz
- c) 5 Hz d) 100 Hz

II. Match the following:

- | | |
|-------------------------|-----------------------|
| 1. Electric Charge | a) ohm |
| 2. Potential difference | b) ampere |
| 3. Electric field | c) coulomb |
| 4. Resistance | d) newton per coulomb |
| 5. Electric current | e) volt |

Ans: 1-c; 2-e; 3-d; 4-a; 5-b

III. True or False

- | | |
|---|--------|
| 1. Electrically neutral means it is either zero or equal positive and negative charges. | -True |
| 2. Ammeter is connected in parallel in any electric circuit. | -False |
| 3. The anode in electrolyte is negative. | -False |
| 4. Current can produce magnetic field. | -True |
| 5. Electric fuse works on Joule heating principle. | -True |

IV. Fill in the blanks:

- Electrons move from **higher** potential to **lower** potential.
- The direction opposite to the movement of electron is called **conventional** current.
- The e.m.f of a cell is analogous to **water pump** of a pipe line.
- The domestic electricity in India is an ac with a frequency of **50** Hz.
- Trip switch is a **electro mechanical** safety device.

V. Short Questions & Answers:

1. On what factors does the electrostatic force between two charges depend?

The numerical value (magnitude) of electric force between two charges depend on the

- value of charges on them.
- distance between them and
- nature of medium between them.

2. What are electric lines of force?

The electric lines of force are straight or curved paths along which a unit positive charge tends to move in the electric field.

3. Define electric field.

The region in which a charge experiences electric force forms the 'electric field' around the charge.

4. Define electric current and give its unit.

Current is the rate at which charges flow past a point on a circuit. The standard SI unit for current is ampere with the symbol A.

5. State Ohm's law.

Ohm's law states that electric potential difference across two points in an electrical circuit is directly proportional to the current passing through it. that is

$$V \propto I$$

The proportionality constant is the resistance (R) offered between the two points.

Hence, Ohm's law is written as,

$$V = RI \quad (\text{or}) \quad V = IR$$

6. On what factor does the resistance of a wire depend at a particular temperature?

The resistance offered by a material at a particular temperature depends on the

- i) geometry of the material and
- ii) nature of the material.

7. Name any two appliances which work under the principle of heating effect of current.

Iron box and water heater work under the principle of heating effect of current.

8. How are the home appliances connected in general, in series or parallel. Give reasons.

Home appliances are connected in parallel because in this type, all other devices will function even if one device becomes faulty.

9. List the safety features while handling with electricity.

Safety features to be followed are ground connection, trip switch, fuse.

10. Can electroplating be possible with alternating current?

As the +ve and -ve electrodes keep changing, electroplating is not possible with alternating current.

3. Magnetism and Electromagnetism

There are two kinds of magnets: Natural magnets and artificial magnets. Lodestone magnetite that occurs in nature is a natural magnet. **Magnetic field** is the region around the magnet where its magnetic influence can be felt. It is denoted by B and its unit is Tesla. Magnets have curved lines around them and they are called **magnetic field lines**. Magnetic flux is the number of magnetic field lines passing through a given area. The number of magnetic field lines crossing unit area kept normal to the direction of field lines is called **magnetic flux density**. Its unit is Wb/m².

It was Oersted who first discovered the magnetic effect of electric current. He proved by experiments the fact that a current carrying conductor produces magnetic field around it. The magnetic field is always perpendicular to the direction of current. The magnetic field lines are denser close to the wire. Michael Faraday showed that a current carrying conductor also gets deflected when it is placed in a magnetic field. This principle is used in the construction of electric motor. An electric motor is a device which converts electrical energy into mechanical energy. A coil carrying current is placed between two poles of a magnet and it turns due to electromagnetic force formed by induction.

An electric generator has a rotating rectangular coil called armature. It is placed between two poles of a permanent magnet. When the coil is rotated induced current flows in the external circuit. Transformer is a device used for converting low voltage into high voltage and high voltage into low

voltage. It consists of a primary coil and a secondary coil. In a **step up transformer** the number of turns in the secondary coil is more. In a **step down transformer** the number of turns in the primary coils is more (than the number of turns in the secondary coil). A transformer cannot be used with direct current because the current in primary coil is constant.

Electromagnetism has wired applications in various fields of technology. In a speaker an electromagnet is placed in front of a permanent magnet. Only the electromagnet is mobile. When electricity passes through its coil the direction of the magnetic field changes rapidly. The forces of attraction and repulsion create vibrations. These vibrations are conducted to paper or plastics which amplify the vibration. Thus sound waves are pumped into the surrounding air.

Maglev is a method of magnetic levitation. Here an object is suspended with no support other than magnetic fields. In Maglev trains two sets of magnets are used. One set repels and pushes the train up off the track. Another set pushed the floating train ahead at great speed without friction. In this technology there is no moving part. The train travels along a guide way of magnets. The MRI (Magnetic Resonance Imaging) now plays a key role in advanced medical equipment. It makes use of electromagnetism to scan the minute details of human body. Scanners and x-ray equipment also make use of electro magnetism as their basic principle.

I. Choose the correct answer:

1. Which of the following converts electrical energy into mechanical energy.
a) **motor** b) battery
c) generator d) switch
2. An electric generator converts.
a) electrical energy into mechanical energy.
b) mechanical energy into heat energy
c) electrical energy into electrical energy
d) **mechanical energy into electrical energy.**
3. The part of the AC generator that passes the current from the armature coil to the external circuit is
a) field magnet b) split rings
c) slip rings d) **brushes**
4. Transformer works on
a) **AC only** b) DC only
c) both AC and DC d) AC not effectively then DC
5. The unit of magnetic flux density is
a) Weber b) weber/metre
c) **weber/meter²** d) weber, meter²

II. Fill in the blanks:

1. The SI unit of magnetic field induction is **teslas T**
2. No force acts in a current carrying conductor when it is **parallel** to the magnetic field.

3. Device which is used to convert high alternating current to low alternating current **transformer**
4. An electric motor converts **electrical energy into mechanical energy**
5. A device for producing electric current is **generator**

III. Match the following:

- | | |
|--------------------------|--------------|
| 1. Magnetic material | a) Oersted |
| 2. Non-magnetic material | b) iron |
| 3. Current and magnetism | c) induction |
| 4. Electromagnetic | d) wood |
| 5. Electric generator | e) Faraday |

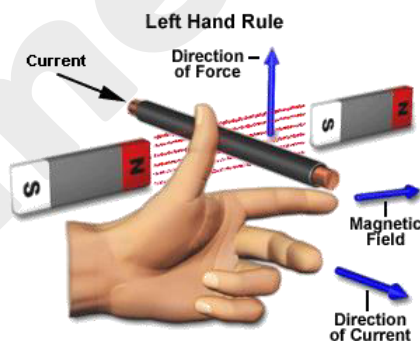
Ans: 1-b; 2-d; 3-a; 4-e; 5-c

IV. True or False

- | | |
|---|--------|
| 1. A generator converts mechanical energy into electrical energy. | -True |
| 2. Magnetic field lines always repel each other and do not intersect. | -True |
| 3. Fleming's left hand rule is also known as Dynamo rule. | -False |
| 4. The speed of rotation of an electric motor can be increased by decreasing the area of the coil. | -False |
| 5. A transformer can step up direct current. | -False |
| 6. In a step down transformer the number turns in primary coil is greater than that of the number of turns in the secondary coil. | -True |

V. Short Answer & Questions:

1. State Fleming's Left Hand Rule.



The law states that while stretching the three fingers of left hand in perpendicular manner with each other, if the direction of the current is denoted by middle finger of the left hand and the second finger is for direction of the magnetic field then the thumb of the left hand denotes the direction of the force or movement of the conductor.

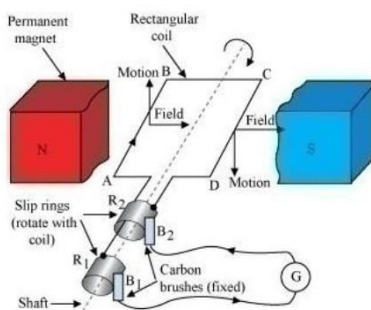
2. Define magnetic flux density.

The number of magnetic field lines crossing unit area kept normal to the direction of field lines is called magnetic flux density.

3. List the main parts of an electric motor.

Permanent magnet, Commutator, carbon brushes, coil, DC power supply.

4. Draw and label the diagram of an AC generator.



5. State an important advantage of ac over dc.

A transformer cannot be used with the direct current (DC) source because of current in primary coil is Constant (te. DC). Then there will be no change in the number of magnetic field lines linked with the secondary coil and hence no emf will be induced in the secondary coil.

6. Differentiate step up and step down transformer.

Step up transformer: The transformer used to change a low alternative voltage to a high alternating voltage is called a step up transformer. Ie. ($V_s > V_p$). In a step up transformer, the number of turns in the secondary coil is more than the number of turns in the primary coil ($N_s > N_p$).

Step down transformer: The transformer used to change a high alternating voltage to a low alternating voltage is called a step down transformer ($V_s < V_p$). In a step down transformer, the number of turns in the secondary coils are less than the number of turns in the primary coil ($N_s < N_p$).

7. A portable radio has a built in transformer so that it can work from the mains instead of batteries. Is this a step up or step down transformer?

Step down transformer: The transformer used to charge a high alternating voltage to a low alternating voltage is called a step down transofermer ($V_s < V_p$). In a step down transformer, the number of turns in the secondary coils are less than the number of turns in the primary coil ($N_s < N_p$).

8. Two coils A and B of insulated wire are kept close to each other. Coil A is connected to galvanometer. While coil B is connected to a battery through a key. What would happen if

- i) a current is passed through coil B by plugging the key?
- ii) The current is stopped by removing the plug from the key?

When the switch is put 'on', at that instant, there is a deflection in the galvanometer. Likewise, when the switch is put 'off', again there is a deflection but in the opposite direction. This proves the generation of current.

9. State Faraday's laws of electromagnetic induction.

Whenever there is a change in the magnetic flux linked with a closed circuit an emf is produced and the amount of emf induced varies directly as the rate at which the flux changes. This emf is known as induced emf and the phenomenon of producing an induced emf due to change in the magnetic flux linked with a closed circuit is known as electromagnetic induction.

4. Periodic Classification of Elements

Dobereiner grouped the elements based on their relative atomic masses in a group of three. When the three elements in a triad are arranged in the ascending order of their atomic masses the atomic mass of

the middle element is nearly the same as the average of atomic masses of other two elements. This is called **Dobereiner's law of triads**.

In 1866 John Newlands proposed the law of octaves. He observed that every eighth element had properties similar to those of the first element like the eighth note in an octave of music is similar to the first. This arrangement is known as **law of octaves**.

In 1869 Dmitri Mendeleev observed that the elements of similar properties repeat at regular intervals when the elements are arranged in the order of their atomic masses. He proposed the law of periodicity which states that 'the physical and chemical properties of elements are the periodic functions of their atomic masses'

In 1913 Henry Moseley proved that the properties of elements depend on the atomic number and not on the atomic mass. The modern periodic law can be stated as follows. "The chemical and physical properties of elements are periodic functions of their atomic numbers"

In the modern periodic table all the elements are arranged in the increasing order of their atomic number. There are **seven** horizontal rows called **periods**. There are **eighteen** vertical columns called **groups**. Based on the physical and chemical properties of elements they are grouped into various families. For example group 1 has Alkali metals and group 2 has Alkaline earth metals. Group 17 has Halogens and group 18 has Noble gases.

The electrons are accommodated in shells around the nucleus. Each shell consists of one or more subshells. These subshells are designed as s,p,d and f and they can accommodate 2,3,10 and 14 electrons respectively. Based on the arrangement of electrons the elements are classified into four blocks (i) s-Block elements (ii) p-Block elements (iii) d-Block elements (iv) f-Block elements.

The Modern periodic table is based on atomic number which is a fundamental property. It correlates the position of the element with its electronic configuration more clearly. The completion of each period is more logical. It is easy to remember and reproduce. Each group is an independent group and the idea of sub groups has been discarded. The table completely separates metals from non metals. The non metals are placed in upper right corner of the periodic table.

Elements are classified as metals, non-metals and metalloids. Metals are hard, shiny, malleable, fusible and ductile. Sodium and potassium are **Alkali metals**; Calcium and magnesium are **Alkaline earth metals**. Iron and nickel are **Transition metals**. Mercury is the only metal that occurs in liquid state at room temperature. Metals are electro positive. They lose electrons to form cations. Metals burn with oxygen to form metal oxides and these oxides are basic. Metals like sodium and potassium react with cold water to liberate hydrogen gas. Non metals like oxygen, nitrogen and carbon have no metallic properties. Some elements have properties of metals and non metals. They are called **Metalloids** e.g. Boron, Arsenic.

Alloys are mixtures of two or more metals. They are formed by mixing **molten metals** thoroughly. Alloys have more useful properties than the original pure metals from which they are made. Brass is an alloy of copper and zinc. Bronze is an alloy of copper and tin. Stainless steel is made up of iron, carbon, chromium and nickel. Duralumin contains aluminium, magnesium, copper and manganese. It is used to make aircraft.

Monel is an alloy of nickel, copper, iron, manganese carbon and silicon. It is stronger than pure nickel and it is extremely resistant to corrosion. It is used in aircraft construction and the skins of experimental rocket planes.

I. Choose the Corret answer:

1. If Dobereiner is related with 'law of triads'. Then Newlands is related with
 - a) Modern periodic law
 - b) Hund's rule
 - c) **law of octaves**
 - d) Pauli's Exclusion principle
2. Modern periodic law states that the physical and chemical properties of elements are the periodic functions of their
 - a) **atomic numbers**
 - b) atomic masses
 - c) similarities
 - d) anomalies
3. Elements in the modern periodic table are arranged in groups and periods.
 - a) 7, 18
 - b) **18, 7**
 - c) 17, 8
 - d) 8, 17
4. The increasing order of the energy of subshells is
 - a) $s > p > d > f$
 - b) **$s < p < d < f$**
 - c) $s < p < f < d$
 - d) $p < s < d < f$
5. If the electronic configuration of an element is $1s^2 2s^2 2p^6 3s^2 3p^1$ then it will occupy block of the periodic table
 - a) s
 - b) **p**
 - c) d
 - d) f

II. Fill in the blanks:

1. In Dobereiner's triads, the atomic weight of the middle element is the average of the atomic masses of 1st and 3rd elements.
2. Noble gases belong to 18 group of the periodic table.
3. The basis of the classifications proposed by Dobereiner, Newlands and Mendeleev was atomic mass
4. B, Si, Ge and As are the examples of metalloids
5. Example for liquid metal is mercury

III. Match the following:

- | | |
|-------------------------|------------------|
| 1. Triads | a) Newlands |
| 2. Alkali metal | b) Calcium |
| 3. Law of octaves | c) Henry Moseley |
| 4. Alkaline earth metal | d) Sodium |
| 5. Modern Periodic Law | e) Dobereiner |

Ans: 1-e; 2-d; 3-a; 4-b; 5-c

IV. State whether True or False:

- 1) Newlands' periodic table is based on atomic masses of elements and modern periodic table is based on atomic number of elements. **- True**
- 2) Metals can gain electrons. **- False**
- 3) Alloys bear the characteristics of both metals and nonmetals. **- False**
- 4) Lanthanides and actinides are kept at the bottom of the periodic table because they resemble each other but they do not resemble with any other group elements. **- True**
- 5) Group 17 elements are named as Halogens. **- True**

V. Assertion and Reason:

1. Statement: Elements in a group generally possess similar properties but elements along a period have different properties.

Reason: The difference in electronic configuration makes the element differ in their chemical properties along a period.

a) Statement is true and reason explains the statement.

b) Statement is false but the reason is correct.

VI. Arrange the Jumbled letters to answer the following

1. **LAOHSENG** - We are a family of live and lies in 17th group of periodic table. (7letters)

Ans: HALOGEN

2. **SDIMUO** - I am being stored in kerosene and be cut by knife

Ans: SODIUM

3. **RIDMUI** - I am the most corrosion resistant silvery white metal and lies in group 9 (7 letters)

Ans: IRIDIUM

4. **TIRNGONE** - I am being used as refrigerant in liquid form with atomic number 7. (8letters)

Ans: NITROGEN

5. **NROI** - I am in your blood as hemoglobin and without me no buildings are possible. (4letters)

Ans: IRON

6. **IHNMUINO** - I am the highly radioactive and newly designated element in the modern periodic table with atomic number 113. (8 letters)

Ans: NIHONIUM

7. **HCLEIRNO** - I am used as a disinfectant for drinking water. (8letter)

Ans: CHLORINE

8. **ENIDOI** - I am mixed with salt and used for thyroid health (6 letters)

Ans: IODINE

9. **BARCON** - I am the key part of biological molecules and have the valency of four. (5letters)

Ans: CARBON

10. **ELIHUM** - I am the first in the noble gas group and used to fill balloons.

Ans: HELIUM

VII. Short Questions & Answers:**1. State Modern Periodic Law.**

The Modern Periodic Law can be stated as follows: "The Chemical and Physical properties of elements are periodic functions of their atomic numbers".

2. What are groups and periods in the modern periodic table?

- The horizontal rows are called periods. There are seven periods in the periodic table.
- The elements are placed in periods based on the number of shells in their atoms.
- Vertical columns in the periodic table starting from top to bottom are called groups. There are 18 groups in the periodic table.
- Based on the physical and chemical properties of elements, they are grouped into various families.

3. What are the limitations of Mendeleev's periodic table?

In the periodic table, Hydrogen is placed at the top of the alkali metals.

Alkali metals are solids while hydrogen is a gas.

Hence the position of hydrogen in the modern periodic table is still under debate as the properties of hydrogen are unique.

4. State any five features of modern periodic table.

- The table is based on a more fundamental property i.e., atomic number.
- It correlates the position of the element with its electronic configuration more clearly.
- The completion of each period is more logical, in a period, as the atomic number increases, the energy shells are gradually filled up until an inert gas configuration is reached.
- It is easy to remember and reproduce.
- Each group is an independent group and the idea of subgroups has been discarded.

5. Chemical Bonding

A Chemical bond is defined as the force of attraction between the two atoms that binds them together as a unit called molecule. Kossel and Lewis explained why atoms combine to form molecules. The explanation is based on the concept of electronic configuration of noble gases. Except Helium, all other noble gases have eight electrons in their valence shells. As atoms of noble gases have stable valence electronic configuration they remain inert and exist as monoatomic gaseous atoms.

The tendency of atoms to have eight electrons in the valence shell is known as the 'Octet rule' or the 'Rule of the eight'. For example sodium with atomic number 11 has one valence electron. Chlorine has electronic configuration 2,8,7. Sodium transfers one electron to chlorine and attains neon's stable configuration. Chlorine gains one electron from sodium and attains the stable argon configuration.

The valence electrons in an atom can be depicted using Lewis dot symbol method. The electron dot symbols represent the number of electrons in the valence shell of an atom. A single dot in the shell represents one valence electron. A pair of dots represents two electrons in the valence shell. We place one dot to each side of the letter symbol. Thus four dots can be placed on four sides. Then the dots are written two to a side until all valence electrons are accounted for.

An ionic **bond** is formed between positive and negative ions. In this type of bond one or more electrons are transferred from the valence shell of one atom to the valence shell of another atom. The atom that loses electrons is called cation (positive ion). The atom that gains electrons is called anion (negative ion). Here the bond is between ions and so it is called ionic bond. As it is explained in terms of electronic transfer it is also called **electrovalent bond**.

Ionic compounds have strong electrostatic force between cations and anions. So they have well-defined geometrical pattern. They are crystalline solids at room temperature. They do not conduct electricity in solid state but their solutions conduct electricity. These compounds have high melting and boiling points. They are soluble in polar solvents like water. These compounds are hard and brittle. They undergo rapid ionic reactions.

Atoms can combine with each other by sharing the unpaired electrons in their outermost shell. Since the covalent bond is formed by sharing of electrons which become common for both atoms, it is also known as atomic bond. Hydrogen molecule is formed by two hydrogen atoms. Each hydrogen atom has one valence electron. Two hydrogen atoms share their electrons and become a hydrogen molecule with two shared pairs of electrons.

Covalent compounds may exist in solid, liquid or gaseous state. (e.g. diamond, water, oxygen molecule). As the compounds have no ions they are bad conductors of electricity. They have relatively

low melting points compared to ionic compounds. Covalent compounds are soluble in non polar solvents like benzene and carbon tetra chloride. These compounds are soft and waxy. In some compounds the sharing of electrons comes from only one of the combining atoms. This bond is called **coordinate covalent bond** or Dative bond.

A chemical reaction in which oxygen is added or hydrogen is removed or electrons are lost is called oxidation. Iron when exposed to moist air is covered with iron oxide called rust. This is an example for oxidation. A chemical reaction in which oxygen is removed or hydrogen is added or electrons are gained is called **reduction**. CuO reacts with H_2 and produces $\text{Cu} + \text{H}_2\text{O}$. Here CuO is reduced by the removal of oxygen. Substances which oxidise are called oxidizing agents and substances which have the ability of reduce are called reducing agents. Oxidation number is the total number of electrons that an atom either gains or loses in order to form a chemical bond with another atom. Oxidation number is also called oxidation state.

I. Choose the correct answer:

- Number of valence electrons in carbon is
a) 2 **b) 4**
c) 3 d) 5
- Sodium having atomic number 11, ready to _____ electrons/electrons to attain the nearest noble gas electronic configuration.
a) gain one b) gain two
c) lose one d) lose two
- Atoms having 1, 2 or 3 electrons in its valence shell will readily form _____
a) cation b) anion
- The element that would form anion by gaining electrons in a chemical reaction is _____
a) potassium b) Calcium
c) Fluorine d) Iron
- Bond formed between a metal and non metal atom is usually _____
a) ionic bond b) covalent bond c) coordinate bond
- _____ compounds have high melting and boiling point.
a) Covalent b) Coordinate **c) Ionic**
- Covalent bond is formed by _____
a) transfer of electrons **b) sharing of electrons** c) sharing a pair of electrons
- Oxidizing agents are also called as _____ because they remove electrons from other substances.
a) electron donors **b) electron acceptors**
- Elements with stable electronic configuration have eight electrons in their valence shell. They are _____
a) Halogens b) metals
c) noble gases d) nonmetals

2.Short Questions & Answers

1. How do atoms attain Noble gas electronic configuration.

The atomic number of Sodium is 11 and its electronic configuration is 2, 8,1. It has one electron excess to the nearest stable electronic configuration of a noble gas - Neon. By losing one electron sodium atom attains the electronic configuration of neon.

The atomic number of chlorine is 17 and its electronic configuration is 2,8,7/ it has one electron less to the nearest stable electronic configuration of a noble gas – Argon. By gaining one electron chlorine attains the electronic configuration of argon.

2. CCl₄ is insoluble in water but NaCl is soluble in water. Give reason.

Covalent compounds are not soluble in water. As CCl₄ is a covalent compound it does not dissolve in polar solvent water.

Ionic compounds are soluble in water. As NaCl is an ionic compound it dissolves in water.

3. Explain Octet rule with an example.

The tendency of atoms to have eight electrons in the valence shell is known as the ‘Octet rule’ or the ‘Rule of eight’.

For example, Sodium with atomic number 11 will readily lose one electron to attain Neon’s stable electronic configuration. Similarly, chlorine has electronic configuration 2,8,7. To attain the nearest noble gas (i.e. argon) configuration, it needs one more electron. So chlorine readily gains one electron from other atom and attains stable electronic configuration. Thus elements tend to have stable valence shell (eight electrons) either by losing or gaining electrons.

4 Write a note on different types of bonds.

Ionic / Electrovalent Bond - Bond formed between cation and anion because of the transfer of electrons from one atom to other atom

Covalent bond - Bond formed between atoms by the mutual sharing of electrons.

Coordinate covalent Bond - Bond formed between atoms by mutual sharing of electrons which are supplied by one atom.

5. Find the odd one out

a) H₂, Cl₂, NaCl, O₂, N₂ = N₂

NaCl is ionic compound but the others are covalent compounds.

b) H₂O₂, MnO₄, LiAlH₄, Cr₂O₇²⁻ = LiAlH₄

LiAlH₄ is a reducing agent but the others are oxidizing agents.

6. Correct the wrong statements.

a) Ionic compounds dissolve in non polar solvents.

Ionic compounds dissolve in polar solvents.

b) Covalent compounds conduct electricity in molten or solution state.

Covalent compounds do not conduct electricity in molten or solution state.

7. Complete the table given below

Element	Atomic Number	Electron distribution	Valence Electrons	Lewis dot structure
Lithium	3	2,1	1	\dot{Li}
Boron	5	2,3	3	$\cdot\dot{B}\cdot$
Oxygen	8	2,6	6	$:O:$

8. Fill in the following table according to the type of bonds formed in the given molecule.

CaCl₂, H₂O, CaO, CO, KBr, HCl, CCl₄, HF₂, CO₂, Al₂Cl₆

Ionic bond	Covalent Bond	Coordinate Covalent Bond
CaCl ₂	H ₂ O	CO
CaO	CCl ₄	Al ₂ Cl ₆
KBr	CO ₂ , HCl, HF	

9. Choose the correct answer from the choices given below:

The property which is characteristics of an Ionic compound is that

a) It often exists as gas at room temperature.

b) It is hard and brittle.

c) It undergoes molecular reactions

d) It has low melting point.

10. Identify the following reactions as oxidation or reduction.

a) $\text{Na} \rightarrow \text{Na}^+ + \text{e}^-$ = oxidation

b) $\text{Fe}^{3+} + 2\text{e}^- \rightarrow \text{Fe}^+$ = reduction

11. Identify the compounds as Ionic/Covalent/ Coordinate based on the given characteristics.

a) Soluble in non polar solvents - **covalent**

b) Undergoes faster/instantaneous reactions - **Ionic**

c) Non conductors of electricity - **Coordinate**

d) Solids at room temperature - **Ionic**

12. Considering MgCl_2 as ionic compound and CH_4 as covalent compound give any two differences between these two compounds.

i) MgCl_2 is an ionic compound where as CH_4 is a covalent compound.

ii) In MgCl_2 the electrostatic force between Mg^{2+} and Cl^- is strong. But the force is weak between carbon and hydrogen atoms in CH_4 .

13. Why are Noble gases inert in nature?

Noble gases have stable electronic configuration. The outer shell in them has 8 electrons (except Helium). So they need not lose or gain electrons. As a result they remain inactive and stable.

3. Give an example for each of the following statements.

a) a compound in which two covalent bonds are formed.

Oxygen Molecule O_2

b) A compound in which one ionic bond is formed.

NaCl

c) a compound in which two covalent and one coordinate bonds are formed.

Carbon Monoxide, CO

d) a compound in which three covalent bonds are formed

Nitrogen molecule $\text{N}_2(\text{N}=\text{N})$

e) a compound in which coordinate bond is formed

NH_3, BF_3

4. Identify the incorrect statement and correct them.

a) like covalent compounds, coordinate compounds also contain charged particles (ions), so they are good conductors of electricity.

Incorrect – Like covalent compounds, coordinate compounds do not contain charged particles (ions), so they are bad conductors of electricity.

b) Ionic bond is a weak bond when compared to Hydrogen bond.

Incorrect – Ionic bond is a strong bond marked by strong electrostatic force.

c) Ionic or electrovalent bonds are formed by mutual sharing of electrons between atoms.

Incorrect – Ionic or electrovalent bonds are formed by transfer of electrons.

d) Loss of electrons is called Oxidation and gain of electron is called Reduction. – **Correct**

e) The electrons which are not involved in bonding are called valence electrons.

Incorrect – Electrons which are involved in bonding are called valence electrons.

6. Acids, Bases and Salts

Acid is a substance which gives H^+ ions or H_3O^+ ions when dissolved in water. **Base** is a substance which releases OH^- ions when dissolved in water. When there is reaction between acids and bases **salt** is produced. Acids and bases neutralize each other to form corresponding salts and water. When hydrogen chloride is dissolved in water it gives H^+ and Cl^- ions in water. This separation does not occur in absence of water.

Acids which are present in plants and animals are called **organic acids**. Example: $HCOOH$ (Formic acid), CH_3COOH (Acetic acid). Acids prepared from rocks and minerals are called **inorganic acids**. Example: HCl (Hydrochloric acid), HNO_3 (Nitric acid). Acids which contain one replaceable hydrogen atom per molecule are called **monobasic acids**. A **dibasic** acid gives two hydrogen ions per molecule and a **tribasic** acid gives three hydrogen ions.

Acids that ionise completely in water are called strong acids. Example: HCl . Acids which partially ionise in water are called weak acids. Example: CH_3COOH (Acetic acid). Acids have sour taste and they turn blue litmus red. Acids react with active metals and liberate hydrogen gas. They react with bases to give salt and water. Sulphuric acid is called the **King of chemicals** because it is used in the preparation of many compounds. Hydrochloric acid is used as a cleansing agent in toilets. Nitric acid is used to manufacture fertilizers, dyes, paints and drugs.

Aqua regia is a mixture of hydrochloric acid and nitric acid in the ratio of 3:1. It is a yellow-orange fuming liquid. It is highly corrosive. It has the power to dissolve noble metals like gold, platinum and palladium. The term aquaregia means 'king of water'. This liquid is used for cleaning and refining gold.

Bases are substances that ionise in Water to form hydroxyl ions (OH^-). A base reacts with an acid to give salt and Water. A **monoacidic base** ionises in water and gives out one hydroxide ion per molecule. A **diacidic base** gives two hydroxide ions and a **triacidic base** gives three hydroxide ions per molecule. Bases which ionise completely in aqueous solution are called **strong bases**. Bases which ionise partially in aqueous solution are called **weak bases**.

Bases have bitter taste and their aqueous solutions have soapy touch. They turn red litmus blue. The base sodium hydroxide is used in the manufacture of soap. Magnesium hydroxide is used as a medicine for stomach disorder. An acid turns blue litmus red. A base turns red litmus blue. Phenolphthalein is colourless in acid medium and it turns pink in basic medium. Methyl orange is pink in acid medium and it turns yellow in basic medium.

P^H scale shows hydrogen ion concentration in a solution. The P^H scale extends from 0 to 14. Acids have P^H less than 7 and bases have P^H greater than 7. A neutral solution has P^H equal to 7. Our body works within the P^H range of 7.0 to 7.8. The P^H of stomach fluid is approximately 2.0. Toothpastes are generally basic and they are used to neutralize the excess of acid in the teeth. The P^H of rain water is 7 but when acid gets dissolved in it the P^H becomes less than 7.

Normal salts, acid salts, basic salts and double salts are some of the types of salts. We take common salt ($NaCl$) in our daily food and it is used as a preservative. Sodium carbonate, known as washing soda is used for softening hard water. Sodium bicarbonate is called baking soda. It is used to make cakes and bread soft and spongy. Bleaching powder (Calcium Oxychloride) is used as a disinfectant. Plaster of Paris (Calcium Sulphate Hemihydrate) is used for

Plastering bones.

Many salts are found as crystals with water molecules. These water molecules are known as **water of crystallisation**. Salts that contain water of crystallization are called hydrated salts. This water of crystallisation makes copper Sulphate blue.

I. Choose the correct answer:

1. $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \underline{\hspace{2cm}}$
(H_2 , O_2 , CO_2)
2. Apple contains malic acid. Orange contains
(citric acid, **ascorbic acid**)
3. Acids in plants and animals are organic acids where as acids in rocks and minerals are
(**Inorganic acids**, weak acids)
4. Acids turn blue litmus paper to
(Green, **Red**, Orange)
5. Since metal carbonate and metal bicarbonate are basic they react with acids to give salt and water with the liberation of
(NO_2 , SO_2 , **CO_2**)
6. p^{H} value of human blood is
(7.0, **7.4**, 7.6)
7. The nature of the tooth paste commonly used is in nature.
(acidic, **basic**, neutral)
8. You are given pure water to test the p^{H} value using p^{H} paper. It shows color.
(white, black, **green**)
9. The hydrated salt of copper sulphate has colour.
(Red, White, **Blue**)

II. Short Questions & Answers

- 1. Name any two metals which do not react with sodium hydroxide.**

Copper and silver (Cu, Ag)

- 2. Write any four uses of acids**

- Sulphuric acid is called king of chemicals because it is used in the preparation of many other compounds. It is used in car batteries also.
- Hydrochloric acid is used as a cleaning agent in toilets.
- Citric acid is used in the preparation of effervescent salts and as a good preservative.
- Nitric acid is used in the manufacture of fertilizers, dyes, paints and drugs.

- 3. Give the significance of p^{H} of soil in agriculture.**

In agriculture, the pH of soil is very important. Citrus fruits require slightly alkaline soil, while rice requires acidic soil and sugarcane requires neutral soil.

- 4. When does the acid rain occur?**

If the atmospheric air is polluted with oxide gases of sulphur and nitrogen, they get dissolved in rainwater and make its pH less than 7. Thus, if the pH of rain water is less than 7, then it is called acid rain.

- 5. What are the uses of Plaster of Paris?**

Plaster of Paris (Calcium Sulphate Hemihydrate - $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$)

- i) It is used for plastering bones
- ii) It is used for preparing moulds for statues.

6. Two acids 'A' and 'B' are given. Acid A gives one hydrogen ion per molecule of the acid in solution. Acid B gives two hydrogen ions per molecule of the acid in solution.

i) Find out the acid A and acid B

a) HCl b) H_2SO_4

ii) Which acid is called the king of chemicals?

Sulphuric acid

7. Define aquaregia.

The term aquaregia is a Latin phrase meaning 'King of water'. The name reflects the ability of aquaregia to dissolve the noble metals such as gold, platinum and palladium.

8. Correct the mistakes

a) Washing soda is used for making cakes and bread soft, spongy.

Baking soda is used for making cakes and bread soft, spongy.

b) Calcium sulphate hemihydrates is used in textile industry.

Calcium oxychloride (Bleaching powder) is used in textile industry.

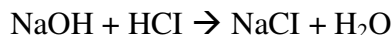
9. Find the odd one out.

Lemon juice, Tomato juice, House hold ammonia, Coffee

Odd one: Household ammonia

10. What is neutralization reaction? Give an example.

When an acid reacts with a base it forms salt and water. This is called neutralization reaction.



11. Why does distilled water not conduct electricity whereas rain water does?

Pure water has no ions and it is a non conductor of electricity. Distilled water is pure. So it does not conduct electricity. Rain water has salt and impurities dissolved in it. the presence of ions in rain water with dissolved salts enables it to conduct electricity.

12. Plaster of Paris should be stored in a moisture proof container, Why?

Calcium Sulphate Hemihydrate is called Plaster of Paris. As it is hygroscopic in nature it absorbs moisture. So plaster of Paris should be stored in a moisture proof container.

13. Write any four used of bases.

i) Sodium hydroxide is used in the manufacture of soap.

ii) Calcium hydroxide is used in white washing of building.

iii) Magnesium hydroxide is used as a medicine for stomach disorder.

iv) Ammonium hydroxide is used to remove grease stains from clothes.

14. The solutions A,B,C,D and E when tested with universal indicator showed pH as 4, 1, 11, 7 and 9 respectively. Among these which solution is

i) neutral - 7

ii) strongly alkaline - 11

iii) Strongly acidic - 1

iv) weakly acidic - 4

v) weakly alkaline - 9

15. Write any five used of salts.

1. Common salt (NaCl)

It is used in our daily food and it is used as a preservative.

2. Washing soda (Sodium Carbonate)

It is used in softening hard water.

3. Baking Soda (Sodium Bicarbonate – NaHCO_3)

It is used in making of baking powder which is a mixture of baking soda and tartaric acid.

4. Bleaching powder (Calcium Oxychloride - CaOCl_2)

It is used as disinfectant.

5. Plaster of Paris (Calcium Sulphate Hemihydrate – $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$)

It is used for plastering bones.

16. Sulphuric acid is called king of chemicals. Why is it called so?

Sulphuric acid is called King of Chemicals because it is used in the preparation of many other compounds. It is used in car batteries also.

7. Organization of Tissues

A group of cells positioned and designed to perform a particular function is called **tissue**. Plant tissues are classified as (i) Meristematic tissues and (ii) Permanent tissues. Meristematic tissues are a group of immature cells. They are capable of undergoing cell division. They are living cells found in growing parts of the plant. They have large nuclei and small vacuoles and they undergo mitotic cell division.

There are three types of meristematic cells. **Apical meristems** are found in the apices of root and shoot and they bring about increase in length. **Lateral meristems** are arranged parallel to the sides of origin and they increase the thickness of the plant. **Intercalary meristems** are found between the regions of permanent tissues. Meristems are actively dividing tissues of a plant. They are responsible for the primary and secondary growth (elongation and thickness) of the plant.

Parenchyma, collenchyma and sclerenchyma are **single permanent** tissues. Parenchyma stores water in many xerophytic plants. They are storages of food reserves. Collenchyma found beneath the epidermis gives mechanical support for growing organs. Sclerenchyma cells are grouped into fibres and sclereids. Fibres are elongated cells with pointed ends and sclereids are broad cells. They are common in fruits and seeds.

Xylem and phloem are the complex tissues of a plant. Xylem is composed of (i) Xylem tracheids (ii) Xylem fibres (iii) Xylem vessels and (iv) Xylem parenchyma. It is a conducting tissue and it conducts water and mineral nutrients upwards from root to leaves. Phloem consists of (i) Sieve elements (ii) Companion cells (iii) Phloem fibres and (iv) Phloem parenchyma. Phloem conducts organic solutes in food materials to different parts of the plant.

I. Match the following:

- | | |
|-------------------|-----------------|
| 1. Sclereids | a) Chlorenchyma |
| 2. Chloroplast | b) Sclerenchyma |
| 3. Simple tissue | c) Collenchyma |
| 4. Companion cell | d) Xylem |
| 5. Tracheids | e) Phloem |

Ans: 1-b; 2-a; 3-c; 4-e; 5-d

B. Match the contents of Column I, II and III

Column I	Column II	Column III
1. Columnar Epithelium	a. Absorption	A. Anchoring of muscle
2. Bones	b. Axon	B. Dendrites
3. Neurons	c. Body framework	C. Secretion

4. Areolar Tissue	d. Ground substance	D. Ciliated
5. Tongue	e. Trachea	E. Fibroblasts
6. Epithelium	f. Striated muscle	F. Visceral tissue

Ans: 1-e-D ; 2-c-A ; 3-b- B ; 4-d- E; 5-f-F ; 6- a-C

II. Choose the correct answer:

- A meristematic tissue consist of
 - Immature cells which are in a state of division and growth**
 - Mature cells
 - Non-living cells
 - Sclerenchyma cells
- The tissue composed of living thin walled polyhedral cell is
 - Parenchyma**
 - Collenchyma
 - Sclerenchyma
 - None of above
- The fibres consist of
 - Parenchyma
 - Sclerenchyma**
 - Collenchyma
 - None of above
- Chlorenchyma is known to develop in the
 - cytoplasm of chlorella**
 - mycelium of a green mould such as aspergillus
 - Spore capsule of moss
 - pollen tube of pinus.
- Companion cells are closely associated with
 - sieve elements**
 - vessel elements
 - trichomes
 - guard cells
- Which of the following is a complex tissue.
 - parenchyma
 - collenchymas
 - xylem**
 - sclerenchyma
- Aerenchyma is found in
 - epiphytes
 - hydrophytes**
 - halophytes
 - xerophytes
- Two long bones of the hand are dislocated in a person who met with an accident. Which among the following may be the possible reason?
 - Tendon injury
 - break of skeletal muscle
 - ligament tear**
 - rupture of areolar tissue
- Unstriated muscles are found in
 - blood vessels
 - gastrointestinal tract
 - urinary bladder
 - all of these**
- Which of the following is not found in a neuron?
 - sarcolemma**
 - dendrite
 - neurolemma
 - axon
- Long, unbranched multinucleated cells are
 - striated muscle cells**
 - smooth muscles
 - cardiac muscles
 - none of the above
- White fibres of connective tissue are made up of
 - Elastin
 - Reticular fibres
 - Collagen**
 - Myosin

13. Brush bordered epithelium is found in
a) stomach b) small intestine
c) fallopian tube **d) trachea**
14. Smooth muscles occur in
a) Uterus b) Artery
c) Vein **d) all of the above**
15. Which muscles are involuntary?
i) striated muscles; ii) smooth muscles; iii) cardiac muscles; iv) skeletal muscles
a) (i) and (ii) **b) (ii) and (iii)**
c) (iii) and (iv) d) (i) and (iv)
16. Nerve cell does not contain
a) Axon b) Nerve endings
c) Tendons d) Bendrites
17. Tendon connects
a) Cartilage with muscles **b) Bone with muscles**
c) Ligament with muscles d) Bone with bone.
18. In a certain type of cell division the diploid number of chromosome is reduced to half. This kind of division occurs in
a) Testis b) Ovary
c) Both ovary and testis d) All body cells

III. Fill in the blanks:

- The **complex** tissues are made up of more than one type of cells and these work together as a unit.
- Sclerenchyma** tissues provide mechanical support to organs.
- Parenchyma, Collenchyma, Sclerenchyma are **simple** type of tissue.
- Xylem** and **phloem** are complex tissues.
- Epithelial cells with cilia are found in **trachea, bronchioles and kidney tubules** of our body.
- Lining of small intestine is made up of **columnar epithelium**
- The two types of skeletal connective tissues are **cartilage** and **bone**
- Humans have 46 chromosomes. Their sperms and eggs will have **23** chromosomes each.
- During pairing of chromosomes in meiosis, the **homologous** chromosomes come to lie side by side.

IV. State whether True or False. If False, write the correct statement:

- Epithelial tissues is protective tissue in animal body.
Ans: False –Compound epithelium is protective tissue in animal body.
- Epithelial layer does not allow regulation of materials between body and external environment.
Ans: False – Epithelium is involved in absorption and elimination of waste.
- Bone and cartilage are two types of areolar connective tissue.
Ans: False – Bone and cartilage are two types of skeletal connective tissues.
- Striated and non-striated tissues are types of epithelial tissues.
Ans: False – Striated and non-striated tissues are types of muscles.
- As growth occurs in an individual the skin cells divide only to replace such cells that are lost from the surface.
Ans: False - Cell division takes place for growth and to replace dead cells.
- Parenchyma is a simple tissue. - **True**
- Phloem is made up of tracheids.
Ans: False – Phloem is made up of sieve elements, companion cells and phloem parenchyma.

8. Vessels are found in collenchymas.

Ans: False – Vessels are found in xylem.

V. Assertion and Reason.

Direction: In each of the following questions, a statement of Assertion is given and a corresponding statement of Reason is given just below it. Of statements given below, mark the correct answer as.

- a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- b) If both Assertion and Reason are true that Reason is not the correct explanation of Assertion.
- c) If Assertion is true but Reason is false
- d) If both Assertion and Reason are false.

1. Assertion: Non-striated muscles are said to be voluntary in nature.

Reason: Non-striated muscles are under the control of our will.

Ans: d) If both Assertion and Reason are false.

2. Assertion: Materials are exchanged between epithelial and connective tissues by diffusion.

Reason: Blood vessels are absent in epithelial tissue.

Ans: a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion

VI. Short Questions & answer:

1. Give two types of Sclerenchyma.

Sclerenchyma cells are grouped into (i) fibres and (ii) sclereids.

2. Name the components of xylem and phloem.

Xylem is composed of different kinds of elements. They are (i) Xylem tracheids (ii) Xylem fibres (iii) Xylem vessels and (iv) Xylem parenchyma. Phloem consists of the following elements (i) Sieve elements (ii) Companion cells (iii) Phloem fibres and (iv) Phloem parenchyma.

3. Name the tissue that connects muscle to bone in humans.

Tendons

4. Name the tissue that stores fat in our body.

Adipose tissue

5. Name the connective tissue with a fluid matrix.

Blood

6. Name the tissue present in the brain.

Nervous tissue

7. What are intercalary meristems? How do they differ from other meristems?

Intercalary meristem lies between the region of permanent tissues. It is part of primary meristem which is detached due to formation of intermittent permanent tissues. It is found either at the base of leaf e.g. pinus or at the base of internodes e.g. grasses.

8. How would you differentiate between meristematic and permanent tissue?

Meristems are actively dividing tissues of the plant, that are responsible for primary (elongation) and secondary growth (thickness) of the plant. Permanent tissues are those in which growth has stopped either completely or for the time being. At times, they become meristematic partially or wholly. Permanent tissues are of two types namely (i) simple tissues and (ii) complex tissues.

9. What is complex tissue? Name the various kinds of complex tissues.

Complex tissues are made up of more than one type of cells that work together as a unit. Complex tissues consist of parenchyma and sclerenchyma cells. However, collenchymatous cells are not present in such tissues. Common example are xylem and phloem.

10. Differentiate fibres from sclereids.

Fibres are elongated sclerenchymatous cells, usually with pointed ends. Their walls are lignified. Fibres are abundantly found in many plants. Sclereids are widely distributed in plant body. They are

usually broad and they may occur in single or in groups. Sclereids are isodiametric, with lignified walls. Pits are prominent and seen along the walls. Lumen is filled with wall materials. Sclereids are also common in fruits and seeds.

11. Mention the most abundant muscular tissue found in our body. State its function.

a. **Skeletal muscle:** These muscles are attached to the bones and are responsible for the body movements and are called skeletal muscles. They work under our control and are also known as voluntary muscles. The muscle fibres are elongated, non-tapering, cylindrical, unbranched and showing alternating dark and light bands, giving them the striped or striated appearance. These cells possess many nuclei (multinucleate). They occur in the muscles of limbs (biceps and triceps of arms). They undergo rapid contraction.

b. **Smooth muscle:** These muscles are spindle shaped with broad middle part and tapering ends. There is a single centrally located nucleus (uninucleate). These fibrils do not bear any stripes or striations and hence are called non-striated. They are not under the control of our will and so are called involuntary muscles. The walls of the internal organs such as the blood vessels, gastric glands, intestinal villi and urinary bladder contain this type of smooth muscle. Movement of food in the alimentary canal or the contraction and relaxation of blood vessels are involuntary movements.

12. Which tissue is the main component of tendons and ligaments? How do they differ in function?

The fibroblasts and the fibres in the fibrous connective tissue is the principle component of tendons and ligaments.

a) **Tendons:** They are cord-like, strong structures that join skeletal muscles to bones.

b) **Ligaments:** They are highly elastic structures. They have great strength and they connect bones to bones.

13. What are the fibres present in the matrix of loose connective tissue?

The matrix consists of collagen fibres, elastin fibres and fibroblast cells.

14. How are collagen fibres organized in dense connective tissues?

Collagen fibres are in parallel bundles. Rows of fibroblasts are present between them.

15. What is skeletal connective tissue? How is it helpful in the functioning of our body?

It is solid, rigid and strong, non-flexible skeletal connective tissue. It provides shape and structural framework to the body. Bones support and protect soft tissues and organs.

16. Which tissue is called middleman between tissue cells and blood? Why?

Lymph is the middleman between tissue cells and blood. It is a colourless fluid filtered out of the blood capillaries. It consists of plasma and white blood cells. It mainly helps in the exchange of materials between blood and tissue fluids. So it is called middleman between tissue cells and blood.

17. Why should gametes be produced by meiosis during sexual reproduction?

When gametes are produced by meiosis they have half the number of chromosomes (haploid). When a haploid male gamete and a haploid female gamete fuse during sexual reproduction, the zygote will be a diploid one. It will have the same number of chromosomes as the parent cell. Any abnormality in the number of chromosomes in the zygote will cause disorders.

18. In which stage of mitosis the chromosomes align in an equatorial plate? How?

The duplicated chromosomes arrange on the equatorial plane and form the metaphase plate. Each chromosome gets attached to a spindle fibre by its centromere which is known as the chromosomal fibre. The centromere of each chromosome divides into two, each being associated with a chromatid.

19. Write one point of difference between

a) **Bone and cartilage**

Bone is solid, rigid, strong and non-flexible. Cartilage is soft, semi-rigid and flexible.

b) **Simple and compound epithelial tissue**

A simple epithelium is formed of a single layer of cells. A compound epithelium consists of more than one layer of cells.

20. Why is blood considered to be a connective tissue?

The blood and the lymph link different parts of the body. Blood carries nutrients and oxygen to all cells. It transports waste materials to the excretory system. So blood is considered to be connective tissue.

21. Give the sequence of the events occurring during prophase of mitosis.

During this stage chromosomes become short and thick and are clearly visible inside the nucleus. Centrosome splits into two daughter centrioles. They move apart and occupy opposite poles of the cell. Each centriole is surrounded by radiating rays, termed as aster rays. Spindle fibres appear between the two centrioles. Nuclear membrane and nucleolus disappear gradually.

22. Why is meiosis called reductional division and mitosis as equational division?

Mitosis results in the production of diploid daughter cells with equal distribution of genetic material (DNA). It maintains the diploid ($2n$) number of chromosomes in daughter cells. So it is called equational division.

Meiosis is called reduction division because the chromosome number is reduced to haploid (n) from diploid ($2n$). meiosis produces four daughter cells from a parent cell.

VII. Give one reason for the following

a) Blood is fluid connective tissue.

The fluid connects all part of the body by transporting substances to all living cells. So blood is called connective tissue.

b) Skeletal muscles contain contractile proteins.

The skeletal muscles undergo rapid contraction during movements. The contractile proteins present in the skeletal muscles are responsible for the contraction and relaxation for the muscles in the limbs.

c) Heart muscles are involuntary in nature

The heart has to pump blood throughout one's life. It has to work continuously. So the cardiac muscles are involuntary. They act on their own and make the heart beat regularly. Their movement cannot be stopped according to our will.

8. Organ Systems in Animals

Two or more organs together form organ systems. They perform functions like digestion, respiration, circulation of blood etc. in our digestive system the food we eat is broken up into simple substances. Nutrition involves (1) ingestion (2) Digestion (3) Absorption (4) Assimilation and (5) Egestion. The alimentary canal is a tubular structure. It consists of mouth, buccal cavity, pharynx, oesophagus, stomach, small intestine, large intestine and anus.

Our salivary glands secrete saliva. It contains an enzyme called **ptyalin**. It converts starch into maltose. Oesophagus is the food pipe. It conducts food into stomach by peristaltic movement. The inner walls of the stomach secrete gastric juice. It converts pepsinogen into active pepsin. Hydrochloric acid that secretes in the stomach kills bacteria in our food. The small intestine performs digestion and absorption. The undigested food goes into the large intestine. It reaches the rectum and is thrown out from the body through anus.

The kidneys and the skin are parts of our excretory system. When it is excessively hot our sweat glands expand and they secrete sweat. The sweat Passes through minute holes in our skin and gets evaporated. As it takes heat for evaporation from the skin we feel cool. Kidneys are bean-shaped organs.

The outer dark region of the kidney is called cortex and the inner lighter region is called medulla. Kidneys maintain the balance of fluid and electrolytes in our body. They also regulate acid-base balance of blood.

By filtration of blood through the epithelial tissues of glomerulus urine is formed. The filtrate contains glucose, amino acids, vitamins, sodium, potassium, bicarbonates and water. They are reabsorbed into the blood by a process of selective reabsorption. The nitrogenous wastes are drained into renal pelvis. It reaches urinary bladder through ureters. This urine is expelled through the urethra.

The reproductive system in human beings has primary and secondary sex organs. The primary sex organs are gonads which produce gametes and excrete sex hormones. The secondary sex organs include genital ducts and glands. They simply help in the transportation of gametes. They do not produce gametes or sex hormones.

The male reproductive system consists of testes, scrotum, vas deferens, urethra, penis and accessory glands. The testes are the male gonads. They produce male gametes (sperms) and the male sex hormone called **testosterone**. The Sertoli cells provide nourishment to the developing sperms. The **scrotum** is a loose pouch-like sac of skin; it acts as a thermo regulator organ. The sperms develop in a temperature of 1-3°C lower than the normal body temperature. So they are outside the human body.

The female reproductive system consists of ovaries, oviducts, uterus and vagina. The ovaries are female gonads and they produce female gametes called egg or ova. They also secrete the female sex hormone **Oestrogen**. Only one ovary ripens every month. The process of release of ovum from the ovary is called **ovulation**.

Fallopian tubes are oviducts. They originate from the uterus. The ovum released by the ovary is pushed into the fallopian tube. Uterus is a pear-shaped muscular, hollow structure. It is in the pelvic cavity. Development of foetus occurs inside the uterus. The narrower part of the uterus is called **cervix**. It leads into the vagina. The female sex hormone oestrogen is secreted by the **graafian follicle** of the ovum. Progesterone is secreted by **corpus luteum**.

I. Choose the correct answer:

- Which of the following is not a salivary gland?
 - sublingual
 - lachrymal**
 - sub maxillary
 - parotid
- Stomach of man mainly digests _____
 - carbohydrates
 - proteins**
 - fat
 - sucrose
- To prevent the entry of food into the trachea, the opening is guarded by _____
 - epiglottis**
 - glottis
 - hard palate
 - soft palate
- Bile helps in the digestion of _____
 - proteins
 - sugar
 - fats**
 - carbohydrates
- Excretion mean _____
 - taking in oxygen from the air and giving out carbon dioxide.
 - disposal of harmful germs and worms from our body.
 - distribution of digested food to the body tissues through blood.
 - removal of nitrogenous wastes generated in the body.**

6. The structural and functional unit of the kidney is _____
a) villi b) liver
c) nephron d) ureter
7. Which one of the following substance is not a constituent of sweat?
a) urea **b) protein**
c) water d) salt
8. The common passage meant for transporting urine and sperms in male is _____
a) ureter **b) urethra**
c) vas deferens d) scrotum
9. Which of the following is not a part of female reproductive system?
a) ovary b) uterus
c) testes d) fallopian tube

II. Fill in the blanks:

1. The opening of the stomach into the intestine is called **pylorus**
2. The muscular and sensory organ which helps in mixing the food with saliva is **tongue**
3. Bile, secreted by liver is stored temporarily in **gall bladder**
4. The longest part of alimentary canal is **small intestine**
5. organs which are concerned with the formation, storage and elimination of urine constitute the **excretory system**
6. The human body functions normally at a temperature of about **37°C**
7. In the process of urine formation, maximum amount of water from the glomerular filtrate is reabsorbed in the **proximal convoluted tubule**
8. The largest cell in the human body of a female is **ovum**

III. State whether the following statements are true or false, correct the wrong statements.

1. Nitric acid in the stomach kills microorganisms in the food.
Ans: - False, Hydrochloric acid in the stomach kills microorganisms in the food.
2. During digestion, proteins are broken down into amino acids.
Ans:- False, During digestion, proteins are broken down into polypeptides and dipeptides.
3. Glomerular filtrate consists of many substances like amino acids, vitamins, hormones, salts, glucose and other essential substances.
Ans: - False, Glomerular filtrate does not contain hormones.
4. Besides the normal constituents, the urine may pass out excess vitamins and not the antibiotics.
Ans: False, Vitamins are reabsorbed into blood by selective reabsorption. Antibiotics like penicillin and aspirin are passed into the filtrate in the distal convoluted tubules. They are then excreted along with urine.
5. The process of release of ovum from ovary is called gestation.
Ans: - False, The process of release of ovum from ovary is called ovulation.

IV. Assertion and Reason

Direction: In each of the following question, a statement of Assertion is given and a corresponding statement of Reason is given just below. Of the four statements, given below, mark one as the correct answer.

- If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- If Assertion is true but Reason is false.

d) If both Assertion and Reason are false.

1. Assertion: Urea is excreted out through the kidneys.

Reason: Urea is a toxic substance. Excess accumulation of urea in blood may lead to death.

Ans: a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

2. Assertion: In both the sexes gonads perform dual function.

Reason: Gonads are also called primary sex organs.

Ans: b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

V. Identify the following parts:

1. It conducts food from pharynx to stomach by peristalsis. - **Oesophagus**
2. Finger like projections which enhance the absorbing capacity of small intestine – **Villi**
3. The bunch of capillaries inside the Bowman's capsule – **glomerulus**
4. This muscular tubes which carry urine from kidney to urinary bladder. – **ureter.**
5. Small sac-like muscular structures that enclose testes – **Scrotum**

VI. Match the following.

Organ	Elimination
1) Skin	a) urine
2) Lungs	b) sweat
3) Intestine	c) carbon dioxide
4) Kidneys	d) Undigested food

Ans: 1-b; 2- c; 3- d; 4- a

VII. Give reasons for the following:

a) Scrotum remains outside the body of human males.

The two testes lie in the respective scrotal sacs. The scrotum acts as a thermoregulator organ and provides an optimum temperature for the formation of sperms. The sperms develop at a temperature of 1-3°C lower than the normal body temperature. For this purpose, the scrotum remains outside the body of human males.

b) The wall of the stomach is not digested by its own enzyme.

The inner wall of the stomach has a protective layer of mucus. So the wall of the stomach is not digested by its enzyme. Moreover the gastric enzyme pepsinogen remains inactive in the stomach. It becomes active pepsin only when food enters the stomach.

VIII. Short Questions & answer:

1. Arrange the following five steps of nutrition in correct sequence.

(digestion, assimilation, ingestion, egestion, absorption)

Ingestion, digestion, absorption, assimilation, egestion.

2. The stomach secretes gastric juice, which contains hydrochloric acid. What is its function?

It kills bacteria in food and makes the medium acidic.

3. How is the small intestine designed to absorb digested food?

The small intestine is the longest part of the alimentary canal, which is a long coiled tube measuring about 5-7m. It comprises three parts – duodenum, jejunum and ileum. The nutrients after digestion are absorbed by villi in the small intestine.

4. Why do we sweat?

The human body functions normally at a temperature of about 37°C. when it gets hot sweat glands start secreting sweat, which contains water with small amounts of other chemicals like ammonia, urea, lactic acid and salts (mainly sodium chloride) . the sweat passes through the pores in the skin and gets evaporated.

5. State any two vital functions of human kidney.

The kidney

1. Maintain the fluid and electrolytes balance in our body.
2. Regulate acid-base balance of blood.
3. Maintain the osmotic pressure in blood and tissues.
4. Help to retain the important plasma constituents like glucose and amino acids.

6. How is it possible to control the urge to pass urine?

When the urinary bladder is full the urine is expelled out through the urethra. The urethra is surrounded by sphincter muscles. When they relax the urethra expands and expels urine. This process is called micturition. The sphincter muscles are voluntary muscles and they help us to control the urge to pass urine.

7. Write the names of male and female sex hormone.

Male – testosterone; Female – Oestrogen

8. Define the following terms:

- a) **Digestion:** The process of nutrition begins with intake of food called ingestion, the breakdown of large complex insoluble food molecules into small, simpler soluble and diffusible particles by the action of digestive enzymes is called digestion.
- b) **Osmoregulation:** The maintenance of constant osmotic pressure in the fluids of an organism by te control of water and salt concentrations is called osmoregulation.
- c) **Enulsification:** Bile salts help in the digestion of facts by bringing about their emulsification (conversion of large fat droplets into small ones).
- d) **Ovulation:** The process of release of ovum from the ovary is known as ovulation.

9. Name the types of teeth present in an adult human being. Mention the functions of each.

Types of teeth	Number of teeth	Functions
Incisors	8	Cutting and biting
Canines	4	Tearing and piercing
Premolars	8	Crushing and grinding
Molars	12	Crushing, grinding and mastication

10. Differentiate the following terms:

a) Excretion and secretion :

Excretion is the removal of nitrogenous wastes in the body through the excretory system. Secretion is the discharge of fluids like hormone, enzyme, oil or sweat for some specific purpose like digestion or excretion.

b) Absorption and assimilation:

Absorption is the process of intake of digested food by villi in the intestine. Assimilation is the incorporation of absorbed nutrients into the tissue cells.

c) Sperm and ovum:

The sperm is a male gamete, produced in the tests. It is motile. Ovum is the female gamete, produced in the ovary. It is non-motile.

d) Ingestion and egestion:

Ingestion refers to the intake of food through the mouth. The throwing out of faecal matter through anal aperture is called egestion.

e) Diphyodont and heterodont:

Human beings have two types of teeth during their life time. The first set is called milk teeth with 20 teeth. The second set consists of 32 permanent teeth. We call these sets Diphyodont. There are four types of Permanent teeth 1) Incisors, 2) Canine 3) Premolars and 4) Molars. We call this dental type heterodont dentition.

f) Incisors and canines:

The incisors are teeth used for cutting and biting. They are 8 in number for human beings. The canines are teeth used for tearing and piercing. A Human adult has four canine teeth.

11. Why do you think that urine analysis is an important part of medical diagnosis?

Urine analysis is useful to find out the sugar level in urine. It is an important diagnostic method for diabetes. Urinalysis is used to diagnose urinary tract or kidney infections and kidney failure. Kidney malfunctions and liver damage can be detected by urinalysis.

12. Why your doctor advises you to drink plenty of water?

Our cells need enough water to keep its components active. Water helps in digestion, circulation of blood, removal of urine and the maintenance of body temperature. Lack of adequate water may cause dehydration and death. So doctors advise us to drink plenty of water.

13. Can you guess why there are sweat glands on the palms of our hands and soles of our feet?

When we are in a stressful situation our palms and feet begin to sweat a lot. This is related our emotions. People who are tense and excited tend to have sweaty palms. This type of sweating protects the layer of the palm when we work hard.

9. Parts of Computer

The computer consists of three parts. They are i) Input Unit ii) Central Processing Unit (CPU) iii) Output Unit.

The Input unit helps to send data and commands for processing. It consists of keyboard, mouse, scanner, barcode reader, mic, web camera and light pen.

The keyboard has number keys and alphabet keys. The mouse has two buttons and a scroll bar in the middle. The right button is used to select files and to open the folder. The left button is used to carry out corrections in the file. The scroll bar is used to move the page up and down the monitor.

The CPU is the brain of the computer. It has i) Memory unit ii) Arithmetic Log unit (ALU) and iii) Control Unit. The Memory Unit saves data and information temporarily. The Arithmetic Log Unit is used to perform arithmetic calculations. The Control Unit controls the functions of all parts of the computer.

The output unit converts commands into understandable characters. Monitor, printer, speaker and scanner are some of the output devices. The monitor is the link to the computer, pictures, numbers and alphabets are displayed on a monitor.

Computers can be classified as i) Mainframe computer ii) Mini Computers iii) Micro or Personal computer iv) Super computer. Personal computer comes under micro computer. It can be classified as Desktop, laptop and tablet.

In order to connect different parts of a computer we use 1) VGA cable 2) USB cable 3) HDMI cable 4) Data cable 5) Audio jack 6) Power cord 7) Micro cable 8) Ethernet.

VGA is used to connect to monitor with the CPU. USB cable is used to connect devices like printer, scanner and keyboard. HDMI cable connects monitor projector with the computer. Data cable connects mobile phone to the CPU. The audio jack is used to connect the speaker and the power cord provides current supply to the unit. Mic cable is connected to the mic and Ethernet is useful to secure internet connectivity.

Bluetooth and Wi-Fi are used to connect to the internet without cables. Using Bluetooth we can share data with nearby devices. Net connectivity can be obtained using Wi-Fi without any connecting cables.

I. Choose the correct answer

- Which one of the following is an output device?
a) Mouse b) Keyboard **c) Speaker** d) Pendrive
- Name the cable that connects CPU to the monitor
a) Ethernet **b) VGA** c) HDMI d) USB
- Which one of the following is an input device?
a) Speaker **b) Mouse** c) Monitor d) Printer
- Which one of the following is an example for wireless connections?
a) Wi-Fi b) Electric wires c) VGA d) USB
- Pen drive is _____ device.
a) Output b) Input **c) Storage** d) Connecting cable

II. Match the following:

- VGA a) Input device
- Bluetooth b) connecting cable
- Printer c) LDMI
- Keyboard d) wireless connection
- HDMI e) output device

Ans: 1-b; 2-d; 3- e; 4-a; 5- c

III. Short Questions & Answer:

1. Name the parts of computer.

Three parts of the computer are Input unit, Central Processing Unit (CPU) and Output Unit.

2. Write out any two differences between input and output devices.

Input device	Output device
The input unit helps to send the data and commands for processing.	The output unit converts the command received by the computer in the form of binary signals into easily understandable characters.
Keyboard, mouse, scanner, barcode, reader, microphone, mic, web camera, light pen are some of the input devices.	Monitor, printer, speaker, scanner are some of the output devices.