Q.1 Balance the following chemical equation: [1]

$$N_2 + H_2 \rightarrow NH_3$$
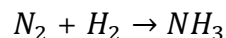
Ans. $N_2 + 3H_2 \rightarrow 2NH_3$

Q.2 What is the pH value of milk? [1]

Ans. 6.8.

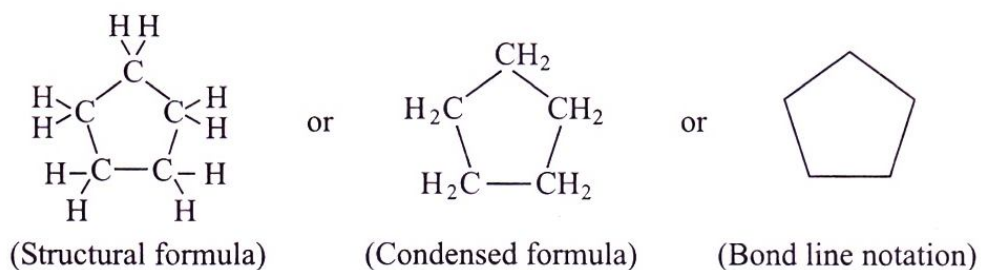**Q.3** What is the melting point of chloroform? [1]

Ans. -63.50^0C.

Q.4 Name one metal which is found in nature in the free state. [1]

Ans. Gold, Silver, Platinum.

Q.5 What will be the formula of cyclopentane? [1]

Ans.

(Structural formula)　　(Condensed formula)　　(Bond line notation)

Cyclopentane

Q.6 Write the full form of A.D.P. [1]

Ans. Adenosine Diphosphate.

Q.7 In evolutionary terms, we have more in common with: [1]

(a) a-Chinese school-boy

(b) a-Chimanzee

(c) a Spider

(d) A Bacterium

Ans. (a) a-Chinese school-boy

Q.8 What is the refractive index of ice? [1]

Ans. 1.31

Q.9 What is the symbol of voltmeter used in electric circuit [1]

Ans.   —(V)—

Q.10   The power of Alternating current is received at .... V.   [1]

Ans.   220V.

Q.11   In which state the largest wind energy farm of India has been established?   [1]

Ans.   In KanyaKumari near Tamil Nadu.

Q.12   What is lens-formula?   [1]

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

Q.13   What is the meaning of First R in 3 Rs?   [1]

Ans.   Reduce
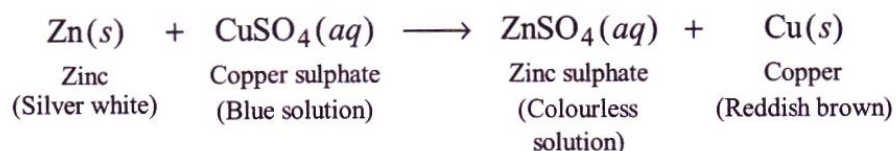
Q.14   What is Ozone?   [1]

Ans.   Ozone is a gas made up of a three atoms of oxygen joined together. The molecular formula of ozone is O_3. Ozone is formed high up in the atmosphere by the action of ultraviolet radiations (coming from the sun) on the oxygen gas. The ozone layer present high up in the atmosphere protests all forms of life on earth by absorbing harmful ultraviolet radiations coming from the sun.

Q.15   Give one food-chain having at least two steps.   [1]

Ans.   Plants-Horse.

Q.16   What do you mean by displacement reaction? Give example. $\left[1\frac{1}{2}\right]$

Ans.   **Displacement reaction:**Those reactions in which a more active metal displace a less active metal or a more active non-metal may displace a less active non-metal from its compound. These reactions are generally found to occur in the solution are called displacement reactions.

$$Zn(s) \; + \; CuSO_4(aq) \; \longrightarrow \; ZnSO_4(aq) \; + \; Cu(s)$$

Zinc	Copper sulphate	Zinc sulphate	Copper
(Silver white)	(Blue solution)	(Colourless solution)	(Reddish brown)

Q.17   Give two main uses of Bleaching Powder. $\left[1\frac{1}{2}\right]$

Ans.   **Two uses of Bleaching Powder:**

(1) It is used for bleaching cotton, linen, wood pulp in textile and paper industry.

(2) It is used in laundry or bleaching washing clothes.

(3) It is used for making unshrinkable wool.

Q.18   What does Amalgam mean? Give example. $\left[1\frac{1}{2}\right]$
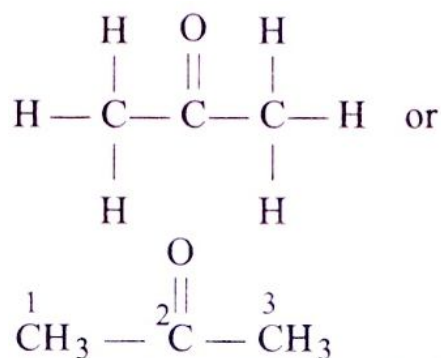
Ans.   **Amalgam:** An alloy of mercury with one or more other metals is known as an amalgam.

Example: Zinc amalgam, Silver amalgam, Sodium amalgam.

Q.19   Draw the electron dot structure for Propanone. $\left[1\frac{1}{2}\right]$

Ans.   **Electron dot structure for Propanone:**

Q.20   In the Modern Periodic table, which are the non-metals among the first ten elements? $\left[1\frac{1}{2}\right]$

Ans.   **Non-metals among the first ten elements:**

H, He, B, C, N, O, F, Ne.

Q.21   Why are some substances biodegradable and some non-biodegradable? $\left[1\frac{1}{2}\right]$

Ans.   Substances which are of organic origin and which can be broken down by the enzymes of saprophytes, e.g., garbage, agricultural waste, sewage, etc. are called biodegradable substances. The substances which are of inorganic origin and cannot be broken down by the enzymes of saprophytes, e.g., plastic materials, glass, polythene are called non-biodegradable substances. Organic substances cannot be utilised by decomposers as food. Due to this, some substances are biodegradable while some others are non-biodegradable.
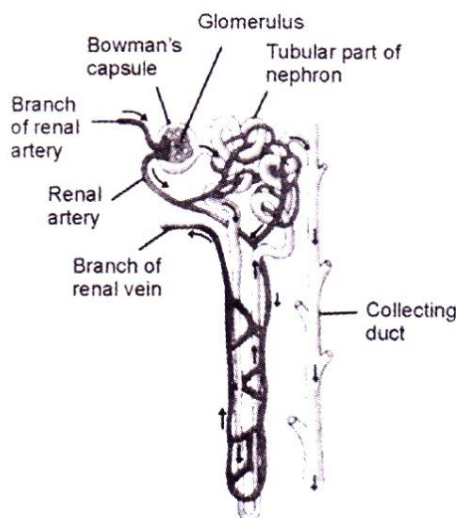
Q.22   Whatis the role of the acid in our stomach? $\left[1\frac{1}{2}\right]$

Ans.   The hydrochloric acid is found in our stomach.

(i) It provides acidic medium for the action of pepsin enzyme.

(ii) It converts inactive propepsin into active pepsin.

(iii) It helps in killing harmful germs which may have come along with food.

Q.23 Draw the diagram of Nephron. $\left[1\frac{1}{2}\right]$

Ans.

Structure of filtration unit—nephron.

Q.24 What factors could lead to the rise of a new species? $\left[1\frac{1}{2}\right]$

Ans. (i) Geographical isolation of a population caused by various types of barriers. 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 by chance alone.

(iii) Variations caused in individuals due to natural selection

Q.25 Explain why the planets do not twinkle? $\left[1\frac{1}{2}\right]$

Ans. The continuously changing atmosphere is unable to cause variations in the light coming from a big-sized planet (Due to refraction) because of which the planet does not twinkle.

Q.26 Find the focal length of a lens of power-2.0D. What type of lens is this? $\left[1\frac{1}{2}\right]$

Ans. $P = -2.0\,D, f = ?$

$f = \frac{1}{p}$

$$f = \frac{1}{-2} = -0.5m$$

This is a concave lens.

Q.27 What are the qualities of an ideal source of energy? $\left[1\frac{1}{2}\right]$

Ans. A good source of energy should be renewable, economical, easily accessible and environment friendly.

Q.28 When does an electric short circuit occur? $\left[1\frac{1}{2}\right]$

Ans. When live wire comes in contact with the neutral wire, then through at that point voltage becomes very small due to which a large current flows through the point causing electic sparks or short circuit.

Q.29 What is pollution? $\left[1\frac{1}{2}\right]$

Ans. **Pollution** is the introduction of contaminants into the natural environment that cause adverse change.[1] Pollution can take the form of chemical substances or energy, such as noise, heat or light. Pollutions are different types:

(1) Air pollution   (2) water pollution   (3) Soil pollution   (4) Noise pollution

**Q.30** Why do we apply paint on Iron-articles? [2]

Ans. It is done so as to prevent iron from rusting. When the surface of iron is coated with paint, its surface does not come smell. i.e., in contact with oxygen and moisture therefore, rusting does not take place.

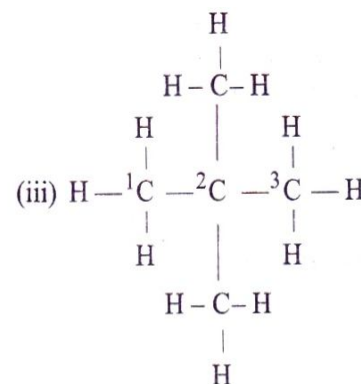**Q.31** Draw the structural Isomers for Pentane. [2]

Ans. **Structural Isomers for Pentane:**
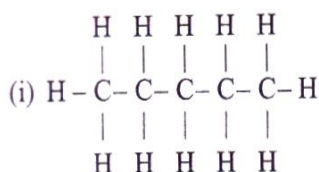
(i) IUPAC name : Pentane
Common name : n-Pentane
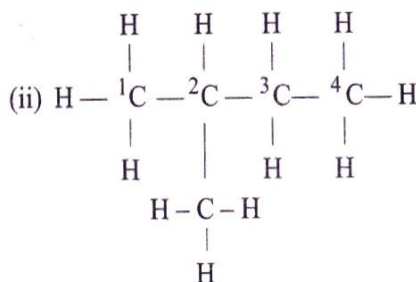
(ii) 2-Methylbutane
(Isopentane)

(iii) 2, 2-Dimethylpropane
(Neopentane)

Q.32 List the properties of magnetic field lines of forces?   [2]

Ans. (i) Magnetic field lines originate from the north pole and terminate on the south pole outside the magnet.

(ii) Magnetic field lines do not cross one another.

(iii) Greater the Magnetic field lines, stronger is the magnetic field and vice versa.

(iv) Magnetic lines are closer near the poles, which shown greater strength of magnetic field near the poles.

(v) The magnetic lines of force contract longitudinally between unlike poles and exert lateral pressure between like poles.

Q.33 Why do we prefer a convex mirror as a rear-view mirror in vehicles?   [2]

Ans. We prefer a convex mirror as a rear view mirrors in vechiles because it always produce an erect image of object & highly dimished. So we can view much larger area of traffic behind the vechile.

Q.34 Differentiate between Eco-system and Biome.   [2]

Ans. An ecosystem is a self-contained unit of living things (plants, animals and decomposers), and their non-living environment (soil, air and water). An ecosystem needs only the input of sunlight energy for its functioning. The examples of ecosystem are: a grassland (meadow); a forest; a desert; a mountain; a pond; a lake, a river; and sea.

A **biome** is a community of plants and animals that have comman characteristics for the environment they exist in. A biome is an area of similar climate where a cluster of species is distributed throughout. At any spot you might, eventually, be able to take a similar collection of species.

Q.35 What evidence do we have for the origin of life from inanimate matter?   [2]

Ans. Miller and Urey designed a glass apparatus and artificially stimulated condition that existed on the earth billion of years ago.

(i) They circulated a mixture of methane (CH_4), ammonia (NH_3), hydrogen (H_2) in the ratio of 2: 2: 1 and water vapour(H_2O) in this apparatus.

(ii) The mixture was maintained at a temperature just below $100^0 C$. They provided energy for interaction of gases in the form of electric sparks in the gas flask.

(iii) At the end of the week, 15 per cent of the carbon (From methane) was converted into simple organic compounds such as amino acids, simple sugars, purines and pyrimidines.

Q.36 What is photosynthesis? Write its importance?   [4]

Ans. **Photosynthesis:** The process by which green plants prepare food is called phostosynthesis. The whole process of phosynthesis can be shown by following equation:

$$6CO_2 + 6H_2O \xrightarrow{sunlight} C_6H_{12}O_6 + 6O_2.$$
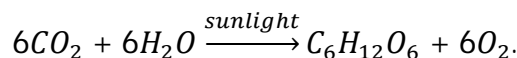
Importance: The significance of phostosynthesis are as follows:

(i) It is the main why through which the order solar energy is made available for different living beings.

(ii) Green plants are the main producers of food in the ecosystem. All other organisms directly or indirectly depend on green plants for food.

(iii) The process of phosynthesis helps in maintaining the balance of carbon dioxide and oxygen in the air.

Q.37 On what factors does the resistance of a conductor depend? Explain it.   [4]

Or

An object 4.0 cm in size, is placed at 25.0 cm, in front of a concave mirror of focal length 15.0 cm. At what distance from the mirror should a screen be placed in order to obtain a sharp image? Find the nature and size of the image.

Ans. The resistance of a conductor depends upon

(i) Length of the conductor: On increasing the length of a wire, its resistance increases; and on decreasing the length of the wire, its resistance decreases. Actually, the resistance of a conductor is directly proportional to its length.

That is $R \propto l$.

When the length of a wire is doubled, its resistance also gets doubled; and if the length of a wire is halved, then its resistance also gets halved.

(ii) Area of cross-section: The resistance of a conductor is inversely proportional to its area of cross-section.

That is, $R \propto \frac{1}{A}$

When the area of cross-section of a wire is doubled, its resistance gets halved; and if the area of cross-section of wire is halved, then its resistance will gets doubled.

(iii) Tempeature: The resistance of all pure metals increases on raising the temperature; and decreases on lowering the temperature.

(iv) Nature of the material: The electrical resistance of a conductor depends on the nature of the material of which it is made.

From the above points

$$R \propto \frac{l}{A}$$

$$R = \rho \frac{l}{A}$$

Where ρ is called the constant of proportionality.

<div align="center">Or</div>

Size of object $(h_1) = 4cm$

Position (u) $-25\ cm$

Focal length $(f) = -15cm$

Position of image (v) =?, Magnification (m) =?

From mirror formula $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$

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

$$\frac{1}{v} = \frac{1}{-15} - \left(\frac{1}{-25}\right) = \frac{1}{-15} + \frac{1}{25}$$

$$\frac{-5+3}{75} = \frac{-2}{73}$$

$$v = \frac{-73}{2}\ cm = -37.5\ cm$$

As $m = \frac{h_2}{h_1} = \frac{-v}{u}$

$$\frac{h_2}{u} = -\frac{\left(-\frac{15}{2}\right)}{25}$$

$$h_2 = \frac{-75 \times 4}{2 \times (-25)}$$

$$h_2 = -6cm$$

The image will be real, inverted & larger than the size of object.

Q38. (a) What are Alloys? What are their uses?   [2+2=4]

(b) Define the term Metallurgy.

Ans. **(a) Alloys:** An alloys is a homogenous mixture of two or more metals, or a metal and non-metal. It is prepared by first melting the primary metal, and then, dissolving the other element sin it in definite proportions. It is then cooled at room temperature. If one of the metals is mercury, then the alloy is known as an amalgam.

Uses:

(1) For making utensils, cutlery, automobile parts, ornamental pieces etc.

(2) For making rock drills, safes, hammering machines, etc.

(3) For making axle, ball bearings, cutting tools, files dies etc.

(4) For making meter scales, pendulum rods, etc.

(5) For making gears, drive shafts, etc.

(b) Metallurgy: The process of extraction of a metal economically on a large scale from their ores and refining them for use is called metallurgy. The process of extraction of a metal depends on the nature of the ore ,impurities present im the ore and the physical and chemical properties of the metal to be extracted. The following common steps are applicable for metallurgy of most metals:

(1) Concentration of ore.

(2) Conversion of concentrated ore into metal oxide.

(3) Extraction of metal by the reduction of metal oxide to metal.

(4) Refining of the impure metal.