Instructions:
(1) Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.
(2) Use Blue or Black ink to write and underline and pencil to draw diagrams.

Note: This question paper contains three sections.

SECTION - I / 1 / (Marks : 15) (Part : 1) (Marks : 15)

15x1=15

(i) Question 1 to 15 carry 1 mark each. Hence, 15 questions are asked.

Note: (i) Answer all the 15 questions.

(ii) Choose the correct answer from the alternatives given in the brackets.

[ Turn over ]
1. The correct statement about Neanderthal man is:
   (the first human like hominid, started agriculture, ate meat and walked erectly, buried
   the dead)

2. __________ is a viral disease.
   (Typhoid, Leprosy, Rabies, Ringworm)

3. An endocrine gland found in the neck is __________.
   (adrenal gland, pituitary gland, thyroid gland, pancreas)

4. In sexual reproduction of flowering plants, the first event involved is __________.
   (fertilization, germination, regeneration, pollination)

5. Sensitive whiskers are found in __________.
   (Bat, Elephant, Deer, Cat)

6. Nephridia are the excretory organ of __________.
   (Protozoans, Coelenterates, Flatworms, Annelids)

7. An example of water-borne disease is __________.
   (scabies, dracunculiasis, trachoma, cholera)
A solution that contains water as the solvent is called an aqueous solution. If carbon-di-sulphide is a solvent in a given solution, then the solution is called __________.
(aqueous solution, non-aqueous solution)

Citric acid is present in lemon. Apple contains __________.
(Lactic acid, Malic acid, Tartaric acid, oxalic acid)

Group 16 elements are called __________.
(Carbon family, Chalcogen family, Halogen family, Nitrogen family)

IUPAC name of the first member of alkyne is _________.
(ethene/ethyne)

The Screw Gauge is used to measure the diameter of a _________.
(Crowbar, Thin wire, Cricket ball)
30 bulbs are connected in series. If one bulb is fused and the remaining 29 bulbs are joined in series and connected to the same supply, the light in the room will be:

(increased, decreased, remained same)

An electric current passing through a metallic conductor produces ________ around it.

(magnetic field, mechanical force, induced current)

SECTION - II / II

(Marks : 40) / ( Marks : 40)

Note : Answer any twenty questions.

In dogs the barking trait is dominant over the silent trait. Using Punnet Square, work out the possible puppies born to two barking parents with genotype (Rr).

Who proposed the theory of Natural Selection? Mention the two principles of this theory.

What are monoclonal antibodies? Mention its use.
Assertion (A): Expulsion of excess unused glucose in the blood through urine is observed in a diabetic mellitus person.

Reason (R): Insulin is not produced in sufficient quantity by pancreas.

(a) Both (A) and (R) are true and (R) explains (A).
(b) Both (A) and (R) are true but (R) doesn’t explain (A).
(c) Only (A) is true but (R) is false.
(d) (A) is false but (R) is true.

Copy and identify the types of neurons given below:

(a)  
(b)  

Draw the given diagram and label the parts.
Mention the two unique characteristics of Mammals.

(a) What are the structural and functional units of a kidney?
(b) Arrange the organs of the human excretory system in the correct order, based on the passage of urine.

ureter, urethra, kidney, urinary bladder

(a) What type of dentition is seen in mammals?
(b) What are modified as tusks in elephants?

Sugar is converted into alcohol.

(a) In the above reaction what kind of process takes place?
(b) Which micro-organism is involved?

A fish taken out of water cannot survive for a long time. Why?
Types of vascular tissues in the plant stem are given which are labelled as A and B.

(a) Name A and B
(b) How do the materials in A move upwards to the leaves?

Observe the following Bio-geo chemical cycle.

(a) Mention the nutrient in the given cycle.
(b) Write the activities from ‘A’ to ‘D’
What is energy management?

Match the suitable renewable and non-renewable sources.

<table>
<thead>
<tr>
<th>Sources</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewable</td>
<td>Coal</td>
<td>Wind</td>
<td>Petroleum</td>
</tr>
<tr>
<td>Non-Renewable</td>
<td>Hydrogen</td>
<td>Natural gas</td>
<td>Solar energy</td>
</tr>
</tbody>
</table>

Take 30g of common salt and dissolve it in 70g of water. Find the concentration of solution in terms of weight percent.
Radha prepared a solution which could be separated by filtration.

(a) Name the type of solution.
(b) Is the solution transparent or opaque?
(c) Mention the nature of the solution.
(d) Mention the size of the solute particle.

<table>
<thead>
<tr>
<th>Element</th>
<th>Atomic mass</th>
<th>Molecular mass</th>
<th>Atomicity Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorine</td>
<td>35.5</td>
<td>71</td>
<td>-</td>
</tr>
<tr>
<td>Ozone</td>
<td>-</td>
<td>48</td>
<td>3</td>
</tr>
<tr>
<td>Sulphur</td>
<td>32</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>14</td>
<td>-</td>
<td>2</td>
</tr>
</tbody>
</table>
The pH values of certain familiar substances are given below:

<table>
<thead>
<tr>
<th>Substance</th>
<th>pH value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lemon juice</td>
<td>2.2 - 2.4</td>
</tr>
<tr>
<td>Tomato juice</td>
<td>4.1</td>
</tr>
<tr>
<td>Coffee</td>
<td>4.4 - 5.5</td>
</tr>
<tr>
<td>Household ammonia</td>
<td>12.0</td>
</tr>
</tbody>
</table>

Analyse the data in the table and answer the following questions.
(a) Which substances are acidic in nature?
(b) Which substances are basic in nature?

Match the following:

<table>
<thead>
<tr>
<th>Ore</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Bauxite</td>
<td>$\text{Fe}_2\text{O}_3$</td>
</tr>
<tr>
<td>(b) Cuprite</td>
<td>$\text{Cu}_2\text{O}$</td>
</tr>
<tr>
<td>(c) Haematite</td>
<td>$\text{CuFeS}_2$</td>
</tr>
<tr>
<td>(d) Copper pyrites</td>
<td>$\text{Al}_2\text{O}_3\cdot \text{2H}_2\text{O}$</td>
</tr>
</tbody>
</table>
Assertion: In thermite welding, aluminium powder and Fe$_2$O$_3$ are used.

Reason: Aluminium powder is a strong reducing agent. Does the reason satisfy the assertion?

Read each description given below and say whether it fits for ethanol or ethanoic acid.

(a) It is a clear liquid with a burning taste.
(b) It is used to preserve biological specimens in laboratories.
(c) It is used to preserve food and fruit juices.
(d) On cooling, it is frozen to form ice flakes which look like a glacier.

Why does a spanner have a long handle?
If an angel visits an asteroid called B 612 which has a radius of 20 m and mass of 104 kg, what will be the acceleration due to gravity in B 612?

Find the effective resistance across the end AC.

Complete the table choosing the right terms within the brackets.

(Zinc, Copper, Carbon, Lead, Lead Dioxide, Aluminium)

<table>
<thead>
<tr>
<th>+ ve electrode</th>
<th>Lead acid accumulator</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>- ve electrode</td>
<td>Lechlanche</td>
<td>-</td>
</tr>
</tbody>
</table>
Match the following:
(a) Charge \( (Q) \) – \( I^2 \times R \times t \)  
(b) Work done \( (W) \) – \( I \times t \)  
(c) Heat energy \( (H) \) – \( R \times I \)  
(d) Potential difference \( (V) \) – \( V \times Q \)

Fill in the blanks.
(a) Motor: a permanent magnet; then  
Commercial motor: __________

(b) Focal length of a lens: metre;  
Power of a lens: __________

If the object is placed at a principal focus \( F_1 \) of a convex lens, draw the ray diagram for the image formation.

Light enters from air to kerosene having refractive index of 1.47. What is the speed of light in kerosene, if the speed of light in air is \( 3 \times 10^8 \) m/s?
Note : (i) Answer any four questions by choosing one question from each part.
(ii) Draw diagrams wherever necessary.

PART - I

(a) How is Tuberculosis transmitted ?
(b) How does Tuberculosis affect our body ?
(c) What is the causative agent of Tuberculosis ?
(d) How can it be prevented ? (any three)

List out the various parts of the human brain and write a note on their functions.

PART - II

Write the two events involved in the sexual reproduction of a flowering plant.
(a) Discuss the first event and explain its types.
(b) Mention the advantages and disadvantages of that event.

We are surrounded by smoke. Is this situation good for our health ? Give reason.
Find how many moles of atoms are there in:

(a) 7 g of Nitrogen
(b) 4.6 g of Sodium
(c) 40 g of Calcium
(d) 14 g of Lithium
(e) 3.2 g of Sulphur

Organic compounds ‘A’ and ‘B’ are the isomers with the molecular formula $C_2H_6O$. Compound ‘A’ produces hydrogen gas with sodium metal, whereas compound ‘B’ does not. Compound ‘A’ reacts with acetic acid in the presence of concentrated $H_2SO_4$ to form compound ‘C’ with fruit flavour. What are the isomers ‘A’, ‘B’ and the compound ‘C’? Write suitable chemical equations.
State law of conservation of momentum and prove it.

(a) The diagram shows an object ‘O’, and its image ‘I’ formed by a lens. In the diagram, draw the lens and the rays to show how the image is formed. Mark focus F, of the lens. Name the lens.

(b) Mention any two achievements of Hubble Telescope.