

Maharashtra State Board
Class IX
Science and Technology Term I Paper – II
Sample Paper 4 – Solution

1. (A)

(1)

- (i) **Probiotic** yoghurt helps to improve our immunity.
- (ii) Establishments where various climatic factors are recorded are called **observatories**.
- (iii) Each level in the food chain is called a **trophic level**.

(B)

- (i) False. Deep well injection is practised for disposal of waste in the seas.
- (ii) False. Data is a collection of unprocessed facts and figures, while information is processed data which is meaningful and useful.

2.

(1) Pneumonia

Pneumonia is a bacterial disease which spreads through droplets spread in the air by an infected person. Dengue spreads through mosquito bite, while leprosy and measles spread through contact with an infected person.

(2) Transitions

In MS PowerPoint, features such as 'Disappear', 'Random bars' and 'Zoom' are types of transitions.

(3) Filamentous, presence of cytoplasmic strands, presence of pyrenoids

Spirogyra is a green alga having a filamentous, unbranched, multicellular and thread-like structure. A large nucleus is suspended in the centre of the cell by a number of cytoplasmic strands. Each chloroplast has a number of small round bodies called pyrenoids. The food is stored in the form of pyrenoids.

(4) Trophic level I

The first trophic level is composed of a large number of individuals, i.e. producers which are capable of producing their own food by trapping the energy of the Sun.

(5) Fungi and Animalia

Organisms belonging to kingdoms Fungi and Animalia lack chlorophyll and thus cannot carry out photosynthesis. Hence, they show complete heterotrophic nutrition.

3.

(1) Leguminous plants have nitrogen-fixing bacteria in their root nodules. These bacteria fix atmospheric nitrogen and provide it to the plants in the soil. They thus increase soil fertility by enriching the soil with nitrogen.

(2) **Steps to insert a graph on MS Excel:**

- Start MS Excel.
- Select 'New' from the 'File' tab and then select the 'Blank' sheet option.
- Type the information that is going to be used to draw the graph in the cells on the 'Sheet'.
- Select the information and click on the required graph in the 'Insert' tab.

(3) **Bryophytes:** *Riccia, Marchantia*
Pteridophytes: *Pteris, Adiantum*

(4) A result, solution or answer calculated by the computer system is eventually sent to an output unit so that the user can read and understand it.
Examples: Screen, monitor, printer

(5) During lightning in the sky, atmospheric nitrogen and oxygen combine to form nitric oxide (NO). This nitric oxide dissolves in water to form nitrous acid (HNO₂) and nitric acid (HNO₃) which react with soil salts to form nitrates in the soil.

(6) Paper bags are biodegradable and get decomposed by the action of microorganisms in due course of time. However, polythene bags are non-biodegradable and get accumulated in heaps over a period of time. They thereby add to pollution and also destroy the aesthetic beauty of the environment. Hence, the use of paper bags is more environment-friendly than the use of polythene bags for packaging.

(7)

- Ferns are ornamental plants seen in gardens.
- They are considered as ornamentals as they add beauty to the place where they are grown.
- They do not bear flowers and fruits but have different types of attractive leaves.
- They reproduce with the help of spores which develop on the lower side of their leaflets in the form of sori.

4.

(1)

- Antibiotics are drugs used to treat infections caused by bacteria.
- Some antibiotics, such as the penicillin, are bactericidal. They work by killing bacteria.
- They interfere with the formation of the cell wall or cell contents of bacteria. As a result, the bacteria die.
- Other antibiotics are bacteriostatic. They arrest bacterial multiplication.
- Excessive use of antibiotics can cause bacteria to become resistant to antibiotics.
- Hence, it is important to take antibiotics only when required.

(2) **Environment-friendly methods of waste disposal:**

- Waste materials should be recycled as far as possible.
- Biodegradable waste should be disposed in biogas plants so that biogas and manure can be used.
- Large amount of domestic and chemical wastes should be disposed of by burning them at very high temperature.
- Composting can also be used to dispose waste materials.

(3) Two main components of a computer system are hardware and software.

- Hardware: Consists of all the electronic and mechanical parts used in a computer system.
- Software: Set of commands given to the computer or information supplied to it (input) and the results obtained from the computer after analysis (output).

(4)

- (a) Bryophytes
- (b) Thallophytes
- (c) Phanerogams

(5)

- Nitrogen cycle is called the perfect cycle in the biosphere because it keeps or maintains the overall percentage of nitrogen constant in the atmosphere, soil and water.
- Nitrogen cycle depends on different kinds of bacteria such as nitrifiers, denitrifiers and nitrogen fixers.
- There is a regular circulation of nitrogen through air, soil, plants and animals through the nitrogen cycle.

(6)

- (a) Memory: Memory is a place where data is stored after being obtained from the input and after the solution is generated by the computer.
- (b) RAM: It is a type of computer memory (Random Access Memory) made using electronic components. This memory is temporary and can be modified.
- (c) Operating system: An operating system provides a mode of communication between the computer and the user. It is also called DOS (Disk Operating System).

(7) Pteridophyta, gymnosperms and angiosperms are referred to as vascular plants.

Of these, angiosperms are further classified as monocotyledons and dicotyledons on the basis of number of cotyledons.

Characteristics of angiosperms:

- The seeds develop inside an organ which is modified to become a fruit.
- Plant embryos in seeds have structures called cotyledons.

5.

(1)

- (a) Some fungi reproduce through spore formation. When these spores settle on food items such as dry fruits, they cause the growth of fungus which spoils dry fruits. Hence, to avoid the entry of such spores, dry fruits are sold in sealed, airtight packets.
- (b) Action of microorganisms on food spoils the food. If such spoilt food is consumed, it may lead to food poisoning. When bacteria and fungi come in contact with food, they start the decomposition process which results in the release of certain chemical toxins which contaminate the food. Consumption of such spoilt food may cause serious illness and food poisoning. Hence, it is important to preserve food properly.
- (c) High-salt and high-sugar mixtures absorb the internal fluid or water of microorganisms, causing them to shrivel up and eventually die. Thus, it helps to keep the food safe from microorganisms and preserve the food for a long time.

(2)

(a) **Key features of disaster management: (Any six points)**

- Prevention of loss and danger
- Improving tolerance to disaster
- Providing relief from disaster, minimising the intensity and extent of harm
- Preparation to face the disaster
- Immediate action in case of disaster
- Assessment of damage and intensity of the disaster
- Arranging for rescue work and help
- Rehabilitation and rebuilding

(b) If a victim is unconscious after mouth-to-mouth resuscitation twice, the heart should be pressed down hard by pressing the chest with both palms. These two actions should be repeated alternately about 15 times. This is called cardio-pulmonary resuscitation (CPR). It helps to bring circulation back to normal.