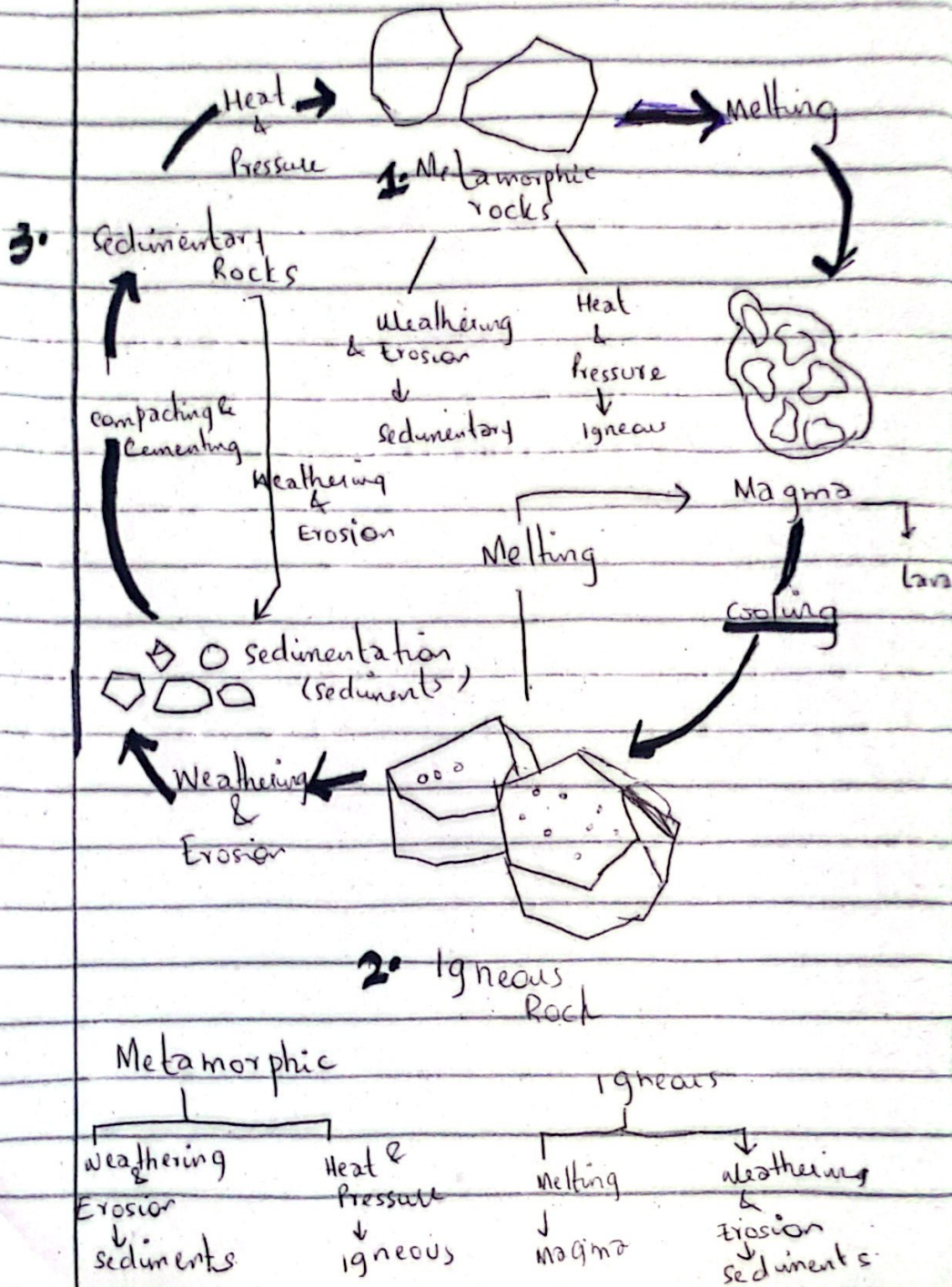


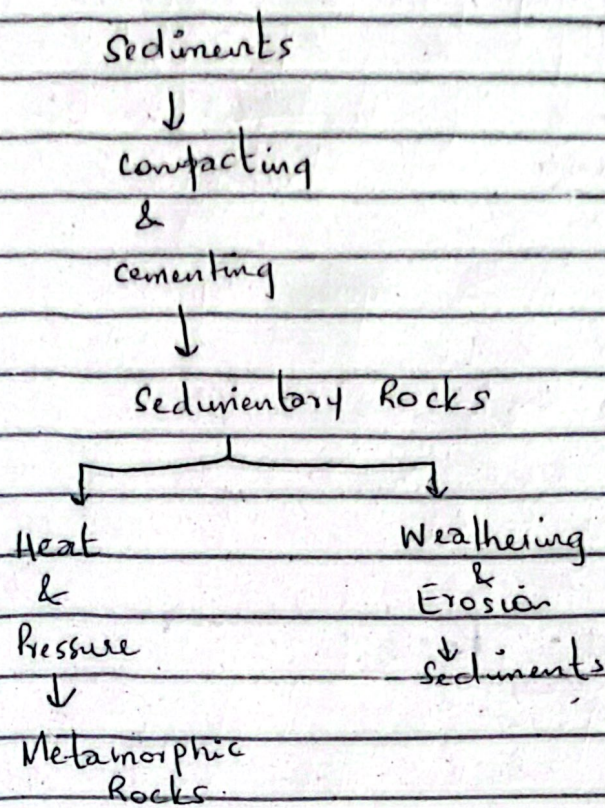
General Science And Ability Mock Exam:

Q4:

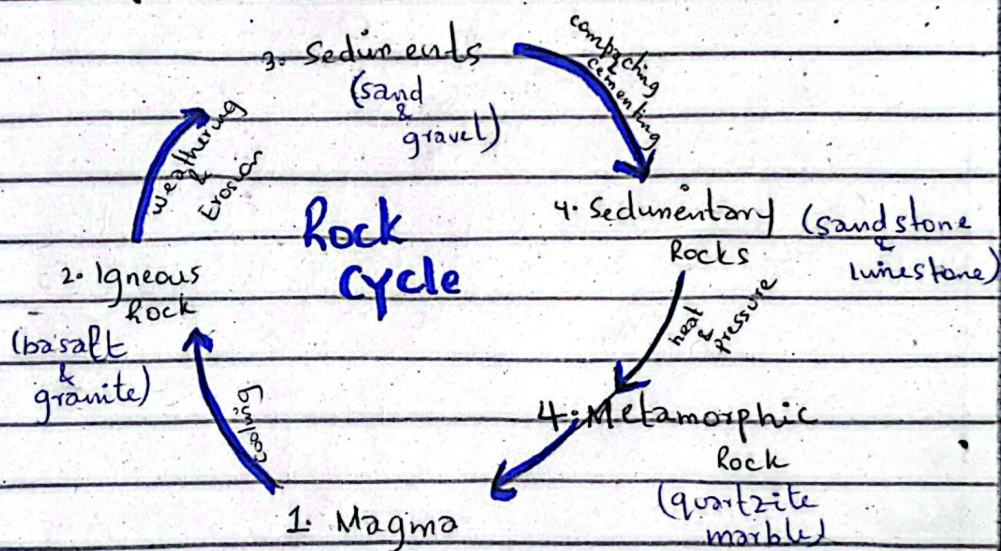
(a) Rock cycle :

This Rock cycle diagram illustrates Rocks present in the Earth from top to bottom.





Simple Illustration:



A rock is a naturally occurring solid aggregate of one or more minerals or mineraloids. This means it consists of multiple layers of

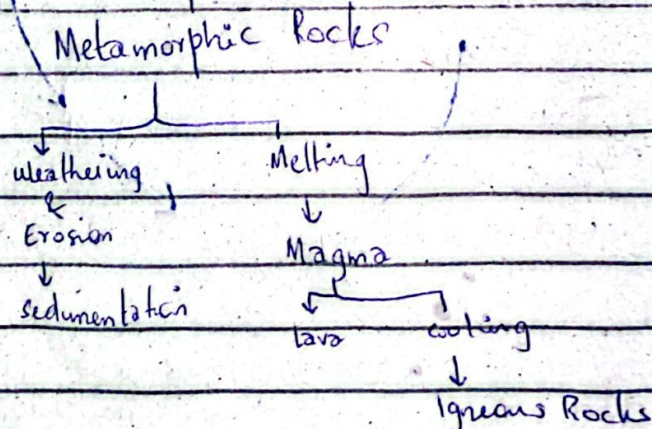
minerals tightly packed together. The Earth's crust is solid rock, which molten rock of ~~Magma~~ Mantle is known as Magma.

The three main types of Rocks are

1. Metamorphic Rocks
2. Igneous Rocks
3. Sedimentary Rocks:

Metamorphic Rocks

Metamorphic rocks start out as other rocks that are modified by heat and pressure and chemical processes. Usually, these processes occur deep below the earth's surface. The process of metamorphism changes existing rocks, altering their mineralogy and texture. The examples of Metamorphic Rocks marble, mica, slate.



Metamorphic rocks due to

extreme heat melt down to make magma. Magma when erupts it becomes lava, while upon cooling it makes up a layer of igneous rocks that move upwards.
~~eg~~

2- Igneous Rocks:

Igneous rocks form from the solidification of Magma or lava. The word 'igneous' comes from the Latin word 'ignis' which means 'of fire'. When Magma cools down and solidifies beneath the Earth's surface intrusive igneous rocks are formed. examples include granite and diorite.

While when lava cools down and solidifies extrusive igneous rocks are formed. for example basalt and andesite.

While it's weathering and erosion gives rise to sedimentation

3- Sedimentary Rocks:

Sedimentary Rocks form by the accumulation and cementation of mineral and organic particles on the Earth's surface, often in water bodies. These rocks usually appears

have layers that hold important clues to Earth's history. They are further divided into three types

1. debris → example: sand

Three types

Classic → weathering of debris → example: sandstone
→ cements cementing → salts, gypsum

Classic → weathering of
Chemical → mineral constituents cementing → salt, gypsum
Animal debris → Rock salt and

Chemical $\rightarrow$ mineral constituents
Organic $\rightarrow$ plant and animal debris $\rightarrow$ Rock salt and Halite
 $\downarrow$
cementing

(b) Acid Rain:

Definition :

Acid Rain, also called acid deposition, is a broad term for any form of precipitation with high concentrations of Sulphuric Acid and Nitric Acids. According to Environmental Protection Agency (EPA) deposition can be wet such as in rain, fog, snow, mist or dry as in dust, gas, fog, smoke or smog.

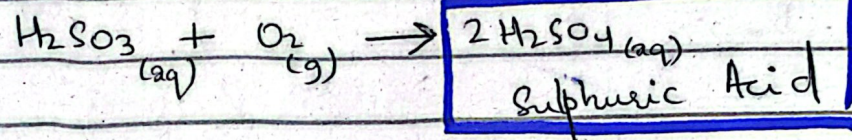
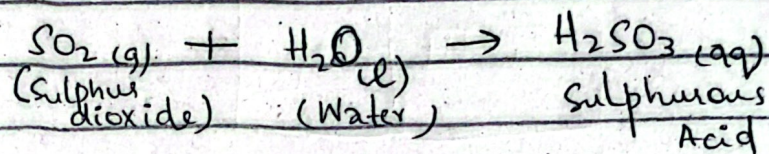
Origin:

The term 'acid rain' was used for the first time by Robert Angus

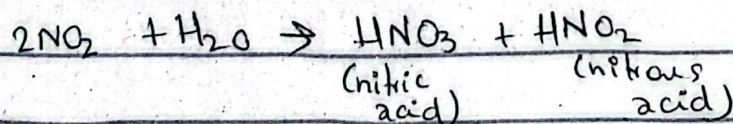
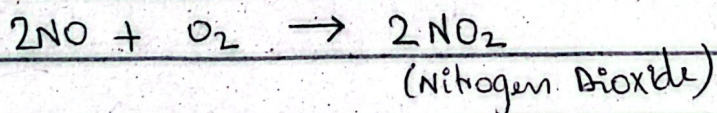
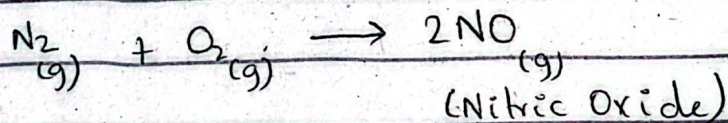
Smith in 1852 while examining rainwater reaction from the UK and Scotland's industrial sites.

Chemical Reactions leading to Acid Rain

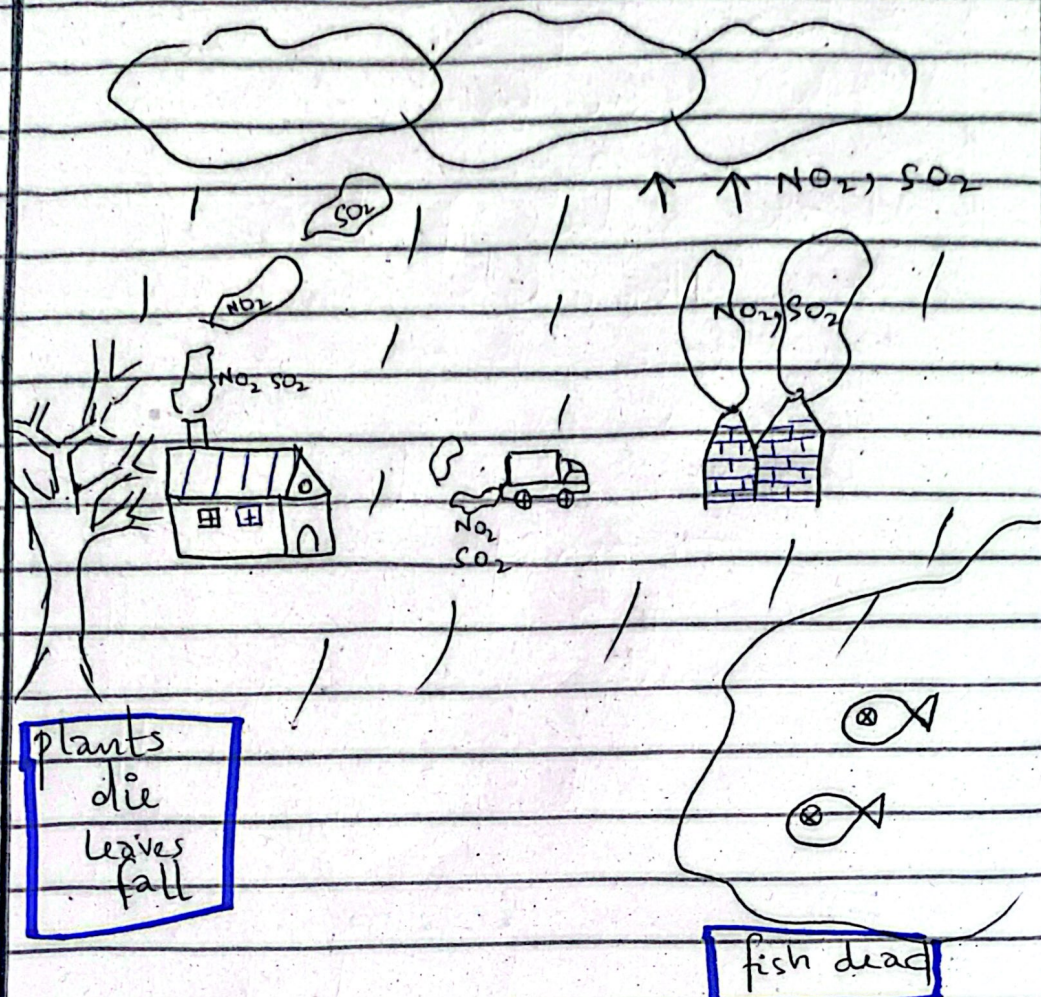
- formation of Sulphuric Acid.



- formation of Nitric Acid:



Effect on Aquatic Life and Vegetation.



Effect on Aquatic Life:

Acid rain makes lakes, streams, ponds, rivers and other water bodies more acidic. It adversely affects aquatic life, such as fresh water shrimps, snails and mussels. Most species cannot survive a pH of less than 5. When the pH becomes 4, due to its acidic nature, the lake is dead, which means it becomes

devoid of life. Again, the fall of acid rain causes aluminium absorption from the soil, which is carried into water bodies. The combination of both makes water bodies toxic for their survival.

Some aquatic species can tolerate acidic pH better than others. Nevertheless, since all ecosystems are interconnected, organisms in one ecosystem depend on the other for their survival.

For example

if a fish species disappears, the animals including the birds that feed on them disappear and will become extinct.

• Effects on Vegetation:

It robs the soil of its essential nutrients such as calcium, releasing aluminium that prevents water uptake by plants. It causes change in soil composition, thus affecting crop production. Acid rain also affects forests, especially those at higher elevations.

It weakens plants and trees by washing away the waxy, protective coating on leaves, thus

damaging them. Acid rain washes away the essential nutrients and minerals from the soil, causing stunted growth in plants by affecting photosynthesis.

4/ Remote Sensing and GIS :

Remote Sensing is a technique of collecting data about Earth's surface using sensors on satellites and aircrafts while GIS (Geographic Information Systems) is a computer based tool for capturing, analyzing, and presenting spatial data.

Remote sensing utilizes satellites and aerial platforms to capture detailed images and data about Earth's surface, which is vital for monitoring environmental changes and disaster impacts.

GIS enhances this data by integrating it into a spatial context, allowing for detailed ~~map~~ mapping, trend detection, and predictive modelling.

of environmental phenomena.

Together they enable effective hazard assessment, mapping of affected areas, and informed decision-making during disasters such as floods and wildfires.

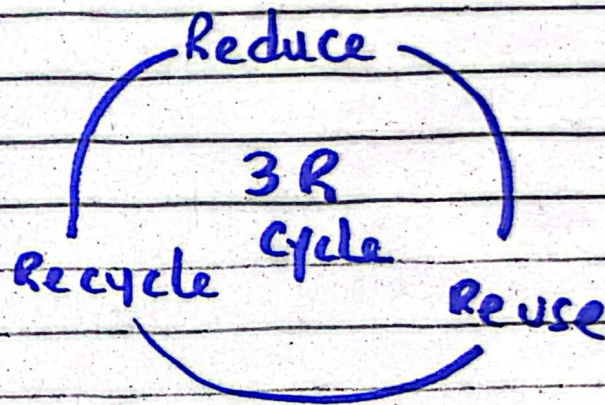
Remote sensing technologies include SAR and LiDAR, are particularly useful for detecting changes in land elevation and assessing wildfire behaviour. The integration of remote-sensing and GIS supports disaster risk reduction and management by providing continuous monitoring and analysis of environmental conditions.

These technologies are indispensable for effective disaster management and environmental governance.

d) Solid-Waste Management

Solid-Waste Management refers to the systematic collection, treatment, and disposal of solid wastes generated from various sources such as households, industries, and agriculture.

It is essential for reducing pollution, preventing diseases, and maintaining environmental hygiene. Effective Solid Waste Management involves the 3 R process.



Production should be according to the need. Excessive production should be discouraged. An ~~map~~ incentive policy should be made which states "for every new product buying an old product should be returned to get 30% off" and in this way it will be recycled. Reusing products that have already been used should be encouraged.

Q5(a)

Balanced Diet.

A balanced diet is the foundation of good health. It provides the essential nutrients, proteins, carbohydrates, fats, vitamins and minerals and water that our bodies require to function effectively. A proper balanced diet ensures that all of ^{our} body's nutritional needs are met, contributing to overall health, energy and well-being.

Proteins:

Proteins are essential for tissue growth and repair.

Carbohydrates:

~~the~~ Carbohydrates are the primary source of energy. Carbohydrates store energy in the form of glycogen which breaks down to glucose when energy levels are low.

b/

Food Preservation:

Food preservation refers to the methods used to extend the shelf-life of food and prevent spoilage.

The two common methods used for food preservation are

Canning

Pasteurization

They are also known as heat-treatment processes.

Canning:

Canning is the process of applying heat to food that is sealed hermetically in a jar to destroy any microorganisms that can cause food spoilage.

In canning, the food is placed in containers, heated under vacuum. It is used for products such as fruit juices, syrup and sauces.

Pasteurization:

It is a mild-heat treatment for relatively brief duration to kill part of the microorganisms to eliminate human pathogens present in food. It destroys pathogenic microorganisms and stops enzyme activity.

There are 3 different methods of pasteurization:

1. Low-temperature long time method
2. High-temperature short time
3. Ultra-High temperature method.

This phenomenon was first discovered by Louis Pasteur for the pasteurization of milk. Hence the name pasteurization.

4// Internet of things:

The Internet of things refers to a network of

physical devices, vehicles, appliances, and other objects embedded with sensors, software, and network connectivity that enables them to collect and share data.

This technology allows these devices to interact with each other and with systems over the internet, facilitating data exchange and automation.

Internet of things encompasses a wide range of application in the contemporary world from smart home devices to industrial automation, enhancing efficiency and connectivity in various sectors.

d//

RAM

ROM

- | | | |
|----|-------------------------------------|--------------------------------|
| 1. | Random-Access Memory | Read-Only Memory |
| 2. | Main memory for ongoing operations. | Stores unmodifiable/boot data. |
| 3. | Volatile (loses data on power loss) | Non-volatile (retains data) |
| 4. | Supports reading and writing | Supports only data reading |
| 5. | Higher-storage capacity | Lower storage capacity |
| 6. | Direct access by CPU | Data must be loaded into RAM |
| 7. | Much faster | Relatively slower |
| 8. | Large in size | Smaller in size |
| 9. | More expensive | Less expensive |

SECTION-II

Q8

(a)

If ROAD is coded as UQ DG then Lake would be coded as DCNH.

A simple way to identify coding is to follow the steps applied in the given data for example

$\begin{matrix} +2 & +1 & +2 & +2 \\ R & O & A & D \end{matrix} \rightarrow \begin{matrix} U & Q & D & G \end{matrix}$
 $\begin{matrix} \swarrow & \downarrow & \downarrow & \swarrow \downarrow \\ S & T & P & BC \end{matrix} \quad \begin{matrix} E & F \end{matrix}$

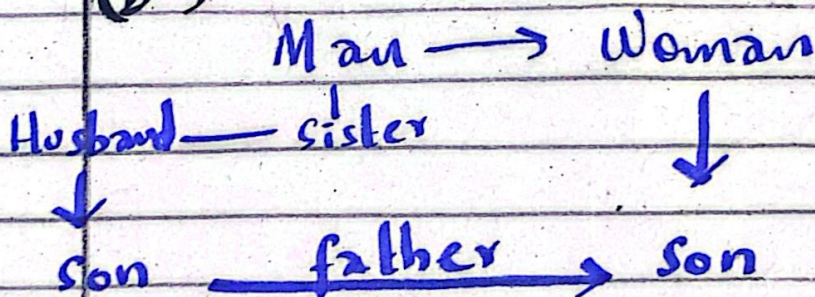
$$L + 2 = O$$

$$A + 1 = B$$

$$K + 2 = N$$

$$E + 2 = G$$

(b)



son of my sister's husband $\rightarrow$ Man's nephew
 Nephew's son is woman's son $\rightarrow$ so wife
 Nephew's wife is the niece in law of the man

C//

R P Q

Q S T

R P Q S T

↓
150
cm

↓
180
cm

Third tallest = Q

Range = 30 cm

d//

4, 12, 6, 18, 9, 27 **13.5**

$$4 \times 3 = 12$$

$$12 \div 2 = 6$$

$$6 \times 3 = 18$$

$$18 \div 2 = 9$$

$$9 \times 3 = 27$$

$$27 \div 2 = 13.5$$

1, 2, 6, 24, 120,

$$\begin{array}{ccc} \overbrace{1 \times 2} & 2 \times 3 = 6 & \cancel{6 \times 3 = 24} \\ 1 \times 2 & & \end{array}$$

$$24 \times 3 =$$

$$1 \times 1 = 1$$

$$1 \times 2 = 2$$

$$2 \times 3 = 6$$

$$6 \times 4 = 24$$

$$24 \times 5 = 120$$

$$120 \times 6 = 720$$

1, 2, 6, 24, 120, 720

↓
Ans