

Part II (Section - I)

Qnos

a. Artificial Intelligence

Artificial intelligence (AI) refers to the stimulation of human intelligence in machines that are programmed to think like humans and mimic their actions. This term may also be applied to a machine which shows the traits of humans like learning and problem solving. (AI) makes it possible for machines to learn from experience, adjust to new inputs and perform human-like tasks. Some of the most known AI examples include chess playing computers and self-driving cars.

According to a report of CNBC, AI can't outsmart humans because humans have the capability to make create something creative and they have the ability to take rational decisions based on emotions. Therefore, AI can't replace humans but those who use AI will replace those who don't.

b. Rocks Formation and Types

Rocks are composed from combinations of minerals that have formed naturally over time. On the basis of their origin rocks can be classified as igneous, sedimentary, and metamorphic.

Igneous rocks are very hard rocks formed deep inside the earth. Examples of igneous rocks are granite and basalt, both are formed from magma which erupts as volcanic lava, as soon as it reaches the surface of the earth, lava cools and solidifies rapidly.

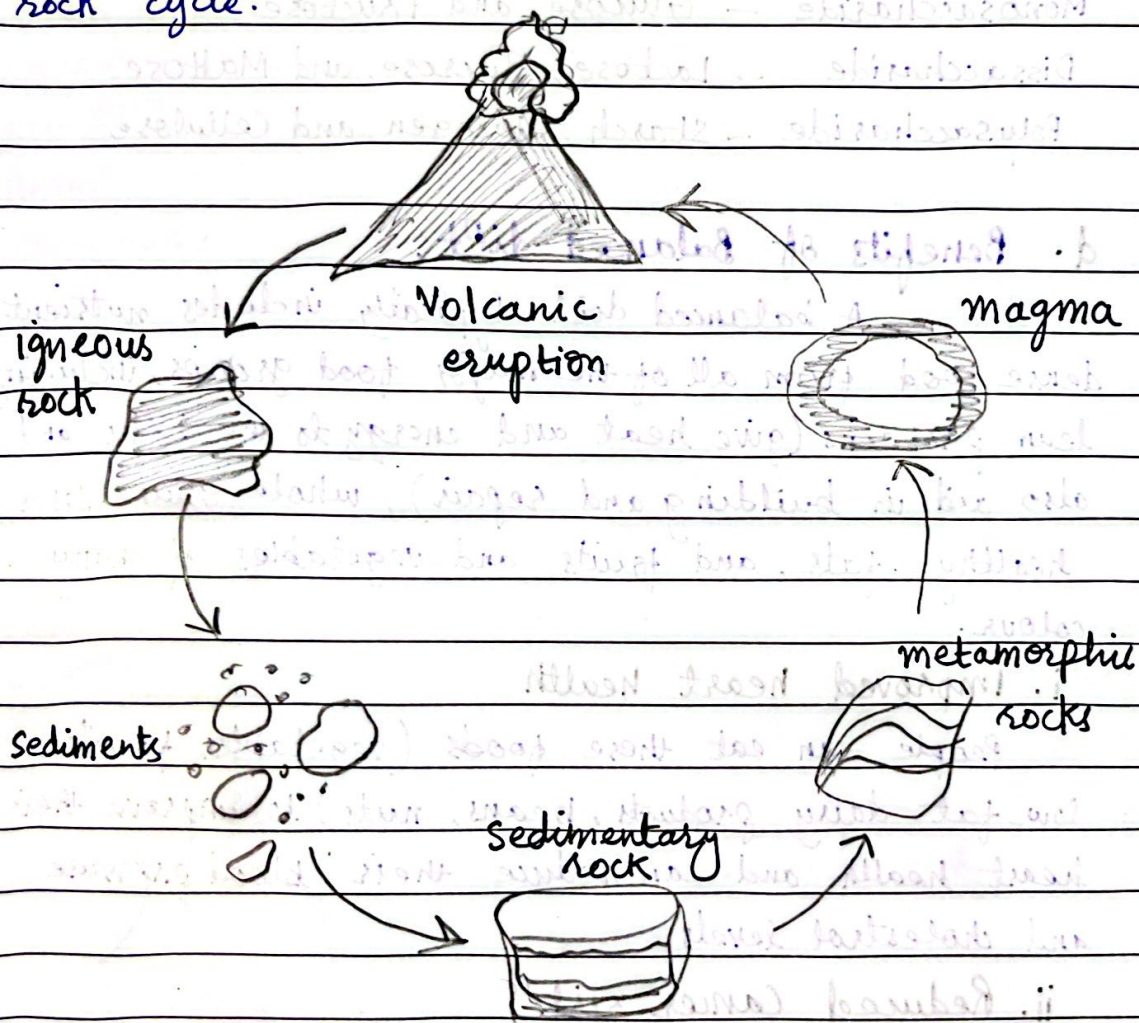
Sedimentary rocks are formed by pieces of other rocks or even once living organisms. Clay, for example, is formed by broken up pieces of other rocks. Coal and Petroleum are formed from the remains of living things like animals and plants. Limestone is formed from substances dissolved in water.

Lastly, metamorphic rocks, that are formed by the transformation of other rocks under great pressure or heat. Like, slate, for example, which is formed from clay and marble, from limestone.

The Rock Cycle

The rock cycle is the interconnected system of processes that causes rocks to change over time. Eventually the processes in the rock cycle can cause one rock to change into each different type. When molten rocks cool, they harden and solidify. This forms igneous rocks, but the rock cycle is just getting started. We know that, both metamorphic and sedimentary rocks form the pieces and transformation of other rocks. There are few different processes that can change igneous rocks like wind and water forces. This process is a part of rock cycle and called weathering and erosion (processes that break down rocks into tiny pieces). When rocks are weathered and eroded, they become sediments. And over time, a process called compaction can lightly squeeze these sediments together, while another process called cementation can cause them to stick together. Together, compaction and sedimentation cementation form sedimentary rocks from sediments. Processes like cementation, compaction, weathering, and erosion can cause the rocks that make up Earth's surface to constantly

shift. Over time, these rocks can end up buried in the middle of mountains or even miles underground. This puts them under huge amounts of heat and pressure, and eventually, all the heat and pressure starts to change these rocks through a process called metamorphism. This heat and pressure causes igneous rocks to transform into metamorphic rock. If the rocks get hot enough, they might even melt and eventually harden back into igneous rocks. Thus, it is called rock cycle.



c. Carbohydrates and its types.

Carbohydrates are the most abundant biological compounds. It is estimated that more than 50% of the total carbon content of the Earth is present in the form of carbohydrate compounds. The name carbohydrate is derived from carbon and water.

H₂O (hydrate). These are commonly called sugars, it also reflects that they are naturally occur sweeteners.

Carbohydrates are divided into three types:

Monosaccharide - Glucose and Fructose

Dissaccharide - Lactose, Sucrose, and Maltose

Polysaccharide - Starch, Glycogen, and Cellulose

d. Benefits of Balanced diet.

A balanced diet typically includes nutrient-dense food from all of the major food groups, including lean proteins (give heat and energy to the body and also aid in building and repair), whole grains (fiber), healthy fats, and fruits and vegetables of many colour.

i. Improved heart health

People can eat these foods (vegetables, fruits, low-fat dairy products, beans, nuts) to improve their heart health and can reduce their blood pressure and cholesterol levels.

ii. Reduced Cancer risk

A person may eat foods that contain antioxidants to help reduce their risk of developing cancer by protecting their cells from damage. Chemicals found in fruits, nuts, vegetables, and legumes act as antioxidants. (Nuts and Seeds, Berries, dark, leafy greens) are a good source of balanced meal options.

iii. Better mood and sleep

According to a research, in 2016, researchers found that diets with a high glycemic load might trigger increased symptoms of depression and fatigue in people who have obesity but are otherwise healthy. A diet which includes refined carbohydrates, such as in soft drinks, cakes, white bread and biscuits, is harmful for a human body in the long run.

Qno # 4^a. Renewable Energy in Pakistan

Renewable energy is energy generated from natural resources — such as sunlight, wind, rain, tides and geothermal heat. Renewable energy in Pakistan is a relatively under-developed sector, however, in recent years, there has been more and more interest to explore renewable energy resources for the energy production.

Solar Power

Wind Power

Micro Hydropower

Tidal Power

When these fossil fuels were started using extensively by all countries across the globe, they led to degradation of environment. Coal and Oil are two major sources that produce large amount of carbon dioxide in the air. The need of the hour, according to scientists, is to look for resources that are available widely, causes no pollution, and are replenishable.

b. Structure of Sun

The sun is the largest object in the solar system. It contains more than 99.8% of the total mass of the solar system. It is the major source of heat energy on the earth surface. Basically, sun consists of three parts: core,

radiative zone, and convective zone in the interior.

THE CORE

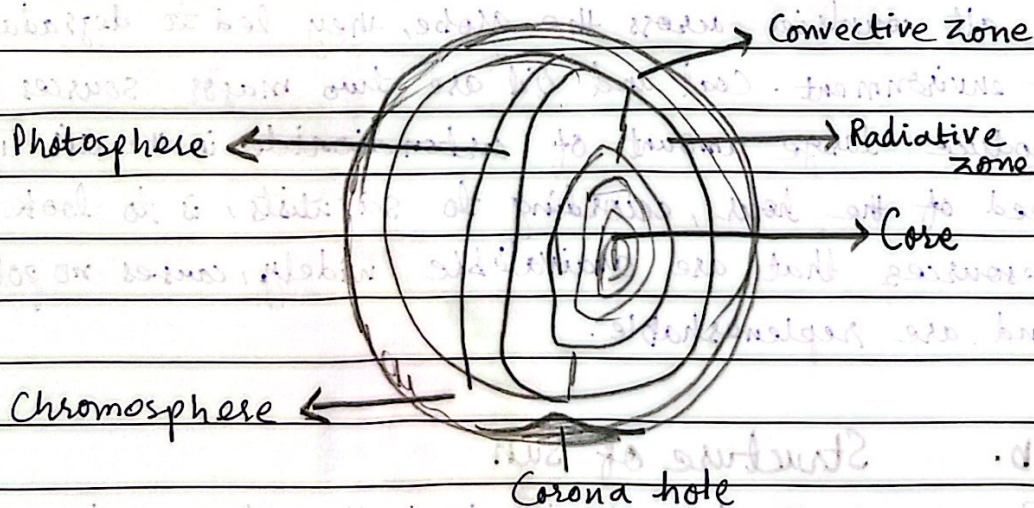
The energy produced in the core powers the sun. The energy produced in the core powers of the sun produces all the heat and light the sun emits. This changes over time as the Sun converts hydrogen to helium in its core.

THE RADIATIVE ZONE

The layer that surrounds the core is radiative zone. Energy generated by nuclear fusion in core moves out as electromagnetic radiation. Energy travels through this zone by radiation, but the photons are frequently scattered by particles in the gas and may take up to one million years to get through.

THE CONVECTIVE ZONE IN THE INTERIOR

This is the outer layer from the radiative zone almost to surface. Heat from the radiative zone heats up the lower levels, which rise to the surface, give off their heat and sink back down again.



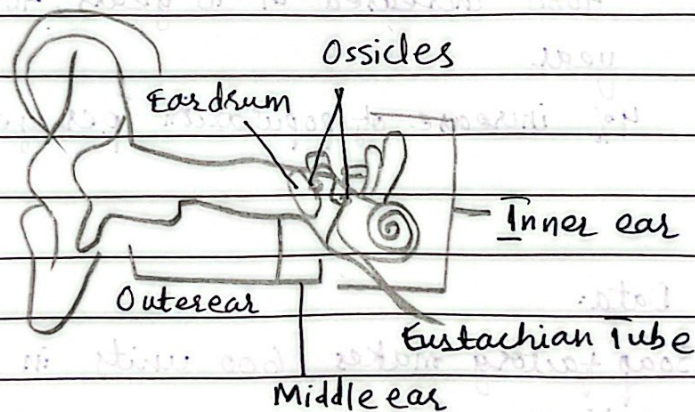
c. Ceramic Material

A ceramic is an inorganic, nonmetallic solid material made from compounds of a metal and a non-metal.

Ceramic materials may be crystalline or partly crystalline.

Ceramic products such as paving and roof tiles are common waste products of the construction and demolition industry. By recycling these ceramics, large amount of waste is diverted from landfills as well as helping reduce the demand for natural resource. Recycled ceramics can be made into useful products such as drainage materials, rock base for driveways and paths or as composite material for aggregates.

d. Structure and Function of Ear.



The three main parts of your ear include the outer ear, middle ear, and inner ear. Your outer ear is the part which is visible. Outer ear consists of ridged cartilage and skin, and it contains glands that secrete ear wax. Its funnel-shaped canal leads to your ear drum, or tympanic membrane.

There are three tiny bones in the middle area—the malleus, incus, and stapes and are referred as ossicles.

They transfer sound vibrations from your ear drum to your inner ear.

Your inner ear contains two main parts: the cochlea and the semicircular canals. Your cochlea is the hearing organ. The snail-shaped structure contains two fluid-filled chambers lined with tiny hairs. When sound enters, the fluid inside of your cochlea causes the tiny hairs to vibrate, sending electrical impulses to your brain.

Qno# 6

a.

Data:

- Total population of a village increased from 18,000 to 22,000 in 10 years.
- Increased percentage of population per year = ?
- 4000 increased in 10 years, 400 increased per year
- 4% increase of population per year of that village.

b.

Data:

- Soap factory makes 600 units in 9 days with 20 machines.
- How many units can be made in 12 days with 18 machines?

$$= \frac{600}{9} \times \frac{20}{12} \times x$$

$$600 \times 9 \times 20 = 12 \times 18 \times x$$

$$108000 = 216x$$

$$108000/216 = x$$

$$500 = x$$

- 500 units can be made in 12 days with the help of 18 machines.

C.

- A car covers a distance of 450 m in 1 minute, whereas train covers 69 km in 45 mins.

- Ratio of their speeds?

- 69 km in metres = 69000 m

- Speed of train is $\frac{69000}{45} = 1533.3$

- Ratio of their speed = $\frac{1533.3}{450}$

= Ratio of their speed is 3.407.

d.

- Perimeter of a pentagon, if all sides are equal to 15 cm.

- $P = 5 \times 15$

- $P = 75 \text{ cm}$

- Perimeter of a pentagon is 75 cm.