

CBS-2022 General Science & Ability

PART-II

(Section-A)

Question no. 2:

Answer: Volcanoes: (A)
Volcanoes are essentially the vents on the Earth's crust through which underground molten mineral matter - magma - is erupted due to the density variation within the volcano. When the magma reaches the surface, as lava, it cools and hardens in the form of a dome or crust. Most volcanoes appear along the sides of the tectonic plates - plates that make up the surface of the world (Diagram A).

Examples:

- * The Pacific Ring of Fire includes two-thirds of the world's volcanoes,
- * Mount Pinatubo, Philippines,
- * Mount Etna, Italy (etc).

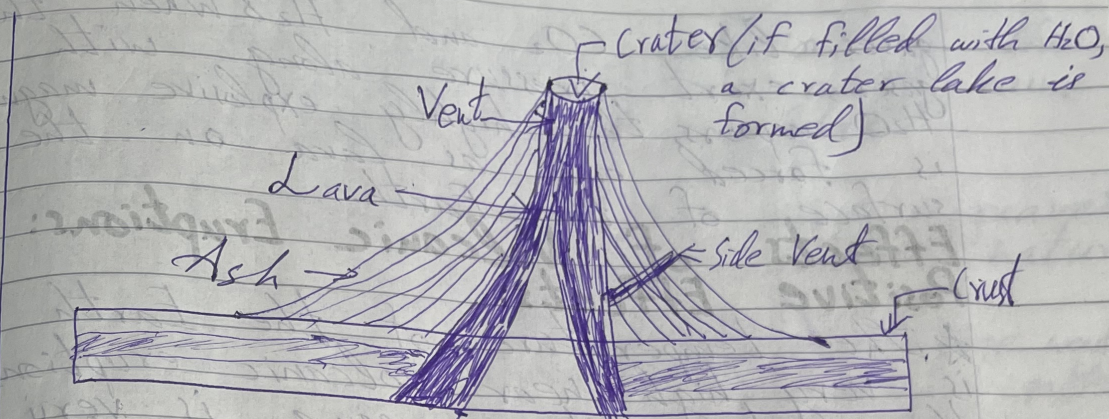


Diagram A: Volcanic Eruption.

Causes of Volcanic Eruption: Although there are multiple causes of volcanic eruptions, the following are predominant:

(i) Movement of Tectonic Plates:

When the tectonic plates move towards each other, below magma, sediments and seawater are forced into the chamber, which eventually overflows, and the eruption of the volcano takes place.

When the tectonic plates move away from each other, magma from the bottom is allowed to rise to fill the gap, which causes an eruption.

(ii) Pressure from the Saturated Gases in Magma:

The magma, in the interior of the Earth, is often saturated with

gases like CO_2 and H_2O . When the gases exert pressure along with H_2O vapours, the highly explosive magma is forced out as lava on the surface of the Earth.

Effects of Volcanic Eruptions:

Positive Effects:

* The temperature of the Earth is very high near volcanic eruptions. Thus, the sites where magma is very close to the surface can be used to produce geothermal energy to ameliorate the renewable energy utilization.

* Additionally, ash extruded from the volcano can be used as a fertilizer for soils.

* Volcanic sites attract many tourists around the world to enjoy astonishing views.

Negative Effects:

* Volcanoes can reflect sunlight back from the stratosphere, which causes abrupt cooling of the temperature, thus damaging vegetation.

* The volcanic gases can cause severe respiratory problems to humans, and pose potential hazards to animals and agriculture.

* The accumulation of SO_2 and CO_2

From the volcanic eruption in the stratosphere can cause acid rain, air pollution and global warming (Diagram B).

*The volcanic eruptions can aggravate earthquakes, tsunamis, and other natural calamities.

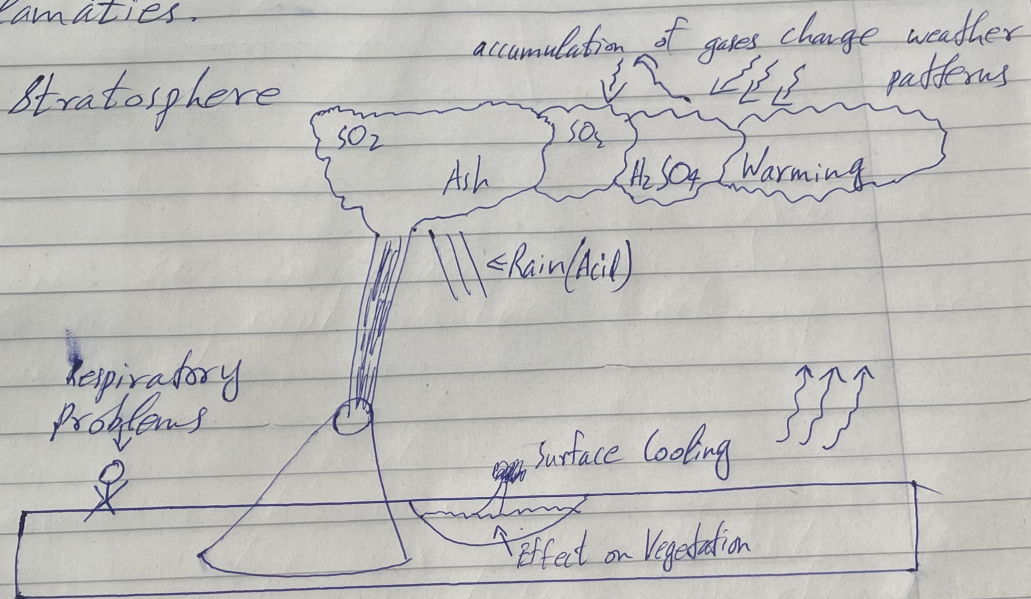


Diagram B: Negative Effects of Volcanic Eruption.