

(Qa) a) What do you know about Volcanoes?
Discuss the causes and effects of
Volcanic eruptions. [5]

b) Differentiate between renewable and non-renewable
sources of energy. Briefly explain wind, energy,
solar energy and biofuels. [5]

c) What is Tornado? How is it formed and
what are the effects of tornadoes? Explain
briefly. [5]

d) Discuss various factors which affect the
variations in the climate of place. [5]

a) 1) What are Volcanoes:

Volcanoes are on the earth's crust through
which the underground molten matter erupts.
When the magma reaches the earth's surface,
as lava, it cools and hardens to form in
the form of dome.

2) Chief features of a Volcano:

The key features associated to volcanoes
are as follows:

2.1) Vent / Neck:

A pipe in the crust through which the magma travels to reach the surface.

2.2) Crater:

The opening of the vent on the surface is called the crater.

2.3) Volcanic Cone:

The magma exiting the crater forms a cone like structure, this is called volcanic cone.

3) Cause of Volcanic Eruptions:

There are many factors that contribute to the eruptions of volcanoes. Few are as follows:

3.1) Sea Floor Spreading:

Sea floor is broken when plates ~~if~~ diverge. As a result Basalt erupts out of fissure. This Basalt magma rises in the gaps to produce ridges and volcanoes.

3.2) Convergence of Tectonic Plates :

The convergence of tectonic plates is a major reason for volcanic eruptions. There are two types of convergence :

- 1) Oceanic-Oceanic plate convergence
- 2) Oceanic-continental plate convergence.

3.3) Orogenic Movements :

The magma in the interior of earth is under high pressure. The upward movement of the mountains decreases pressure on magma. The magma, due to this decrease in pressure, melts and forces itself out of fissures

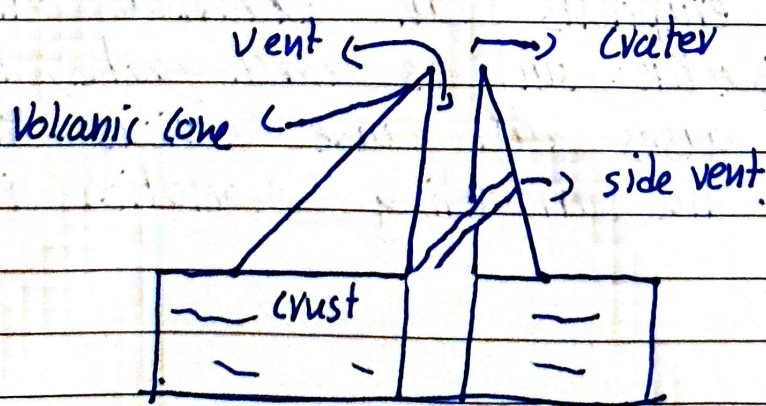


fig 1: labelled diagram of volcano

4) Effects of Volcanic Eruption:

Volcanic eruptions have both positive & negative effects ~~on~~.

4.1) Positive Effects:

The sites near magma are usually very high in temperature, making it ideal to produce geothermal energy. The ash extruded from volcano can be used as fertilizer.

Moreover, volcanic sites attract lots of tourists which can help the local economy.

4.2) Negative Effects:

Volcanic eruptions can exacerbate and proliferate natural disasters such as earthquakes, tsunamis. The volcanic gases can cause serious respiratory problems. The surrounding vegetation is badly affected.

b) What is Renewable Energy?

Renewable energy is the type of energy that is replenished on human time scale. These energy sources contain little carbon

and are therefore environment friendly. Such energy sources are inexhaustible and therefore reusable.

1.1 Examples of Renewable Energy Sources:

- 1) Solar Radiation
- 2) Biomass & Wind Energy
- 3) Hydro power

2) What is NON-Renewable Energy:

This, unlike the aforementioned, is a type of energy that does not replenish naturally.

It contains higher amount of carbons and therefore is bad for the environment.

It is an exhaustible form of energy and so can run out eventually.

2.1) Examples of Non-Renewable Sources:

- 1) Nuclear Energy
- 2) Oil
- 3) Gas

3) Wind Energy :

As a renewable energy source. The way this works is that wind mills are installed in areas engulfed with strong winds. The winds rotate the wind mills, which is connected with turbines that convert the kinetic energy, due to air motion, into electrical energy.

4) Solar Energy :

This ~~use~~ employs radiations emitted by the sun to produce electricity. The solar panel, comprised of photovoltaic cells, generates electricity when exposed to solar radiations. This, like wind energy, is a renewable energy source.

5) Bio fuels :

This type of fuel is typically obtained from the biomass of animals, plants etc. This is a non-renewable energy source and therefore is exhaustible. In bio fuel energy production, biomass is combusted at high temperature to produce steam. The steam drives the power generators through rotating the turbines, creating bio fuels.

c) 1) What is a tornado:

A tornado is a violent funnel shaped system of ~~is~~ rotating winds. In The violent rotating air columns reach all the way to the surface of the earth from the ~~co~~ cumulonimbus cloud. ~~At~~ Most tornadoes have speeds less than 110 mibs per hour & are about 250 feet wide.

2) How are tornadoes formed:-

Formation of tornadoes ~~is~~ greatly varies on sundry factors, but the primary steps through which it is formed is as follows:

2.1) Storm Development Stage:

The radiations from the sun reach the earth's surface and warm up the air near ground. As a result some air pockets are formed which create an unstable atmosphere. The air pockets rise and as the temperature decreases with height ~~not~~ cumulonimbus clouds are formed.

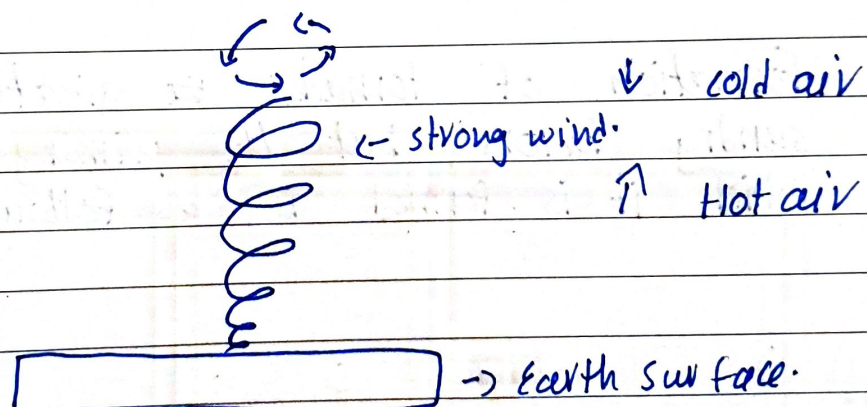
2.2) Storm organization:

The change in wind speed ~~caused~~ causes a horizontal rotation motion, which

tilts vertical as it gains strength.

2.3) Tornado maturation stage:

The rotation becomes so concentrated that a narrow column of violently rotating air is formed. The column eventually reaches the ground and that's how tornadoes are formed.



3) Effects of Tornadoes

The havoc wreck by a tornado generally depends on the area is struck i.e. urban, forest, and the speed of the winds. Depending on the intensity of the winds a tornado can cause slight damage such as damaged chimney and can also inflict heavy damage such as blowing cars, destroying houses.

d) 1) What is climate:

Climate is the average weather affecting a particular region. International conventions now designate a period of minimum 30 years for defining a climate. Climate is affected by several factors, some of them as are as follows:

2) Altitude:

The height of a region can affect the climate. Reason being is that as the height increases the ~~winds~~ air loses density. Air loses density and becomes cooler, therefore the higher the altitude of a place the cooler it will be.

3) Latitude:

Latitude is another factor that affects the climate. At equator, the sun's radiations are the strongest therefore the temperature is high. But as you move further away from the equator, the radiations from sun get weaker and hence the temperature decreases.

4) Distance from sea:

Distance from the sea can influence the temperature of an area. The areas closer to water bodies such as sea have a relatively cool temperature. This is primarily because water bodies take longer to warm or cool down.

5) Usage of Fossil Fuels:

Excessive usage of fossil fuels can leave an impact on climate in a particular area. The Economist indicates that almost 80% of world's energy is generated through fossil fuels. The carbon emission from fossil fuel usage can trap sun radiations which can impact the climate.

6) Deforestation:

Being one of the major causes of climate change, can reduce the carbon content in air and super supplant it with oxygen.