FEDERAL PUBLIC SERVICE COMMISSION
COMPETITIVE EXAMINATION-2022
FOR ECRUITMENT TO POSTS IN BS-17
UNDER THE FEDERAL GOVERNMENT
GENERAL KNOWLEDGE-I (GENERAL SCIENCE & ABILITY)

Roll Number

TIME ALLOWED: THREE HOURS	**PART-I (MCQS) MAXIMUM MARKS = 20**
PART-I(MCQS): MAXIMUM 30 MINUTES	**PART-II MAXIMUM MARKS = 80**

NOTE: (i) **Part-II** is to be attempted on the separate **Answer Book.**
(ii) Attempt **ONLY FOUR** questions from **PART-II** by selecting **TWO** questions from **EACH SECTION.** **ALL** questions carry **EQUAL** marks.
(iii) All the parts (if any) of each Question must be attempted at one place instead of at different places.
(iv) Write Q. No. in the Answer Book in accordance with Q. No. in the Q.Paper.
(v) No Page/Space be left blank between the answers. All the blank pages of Answer Book must be crossed.
(vi) Extra attempt of any question or any part of the question will not be considered.
(vii) **Use of Calculator is not allowed.**

PART – II
(SECTION – A)

Q. 2. (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 a 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 a place. (5)**(20)**

GSA 2022

M. Zeeshan Ullah

Section-A

11:45
01:20
Total time
80 minute

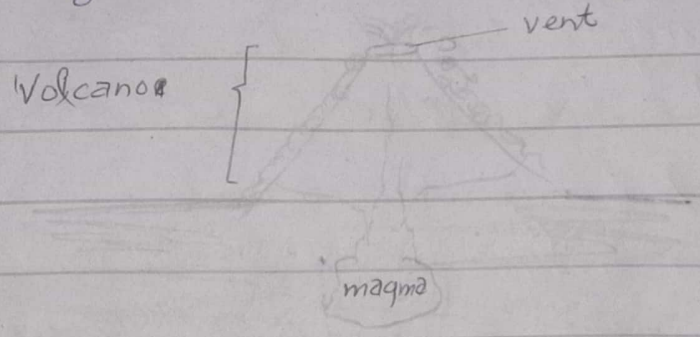
Q1-

a- Volcanoes, Causes and Effects of Volcanic Eruption

Answer

i- VOLCANOES

Volcanoe is a vent in the Earth through which magma (molten rock) inside the Earth erupts and come to the surface



ii- VOLCANIC ERUPTION

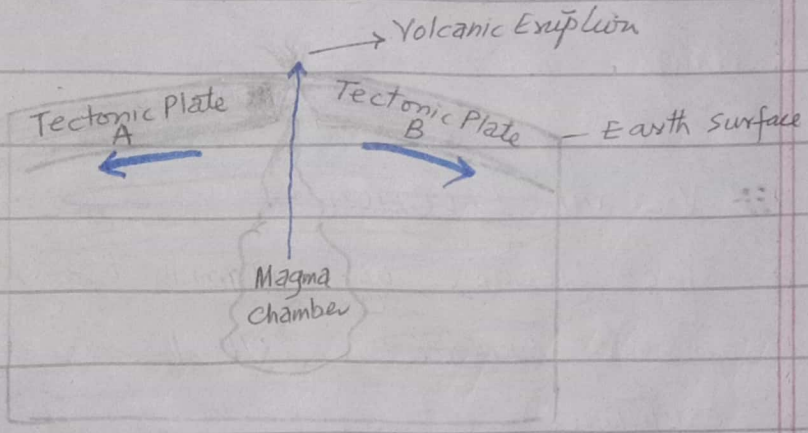
The ejection of magma through volcano to the surface is called volcanic eruption.

iii- CAUSES OF VOLCANIC ERUPTION

The causes of volcanic eruption can be briefly elaborated as under:

Earth's pressure and temperature increase with the depth There are certain locations inside the Earth, where magma occur under certain physiochemical conditions due to

prevailing high pressure and temperature. Tectonic plates move with respect to each other along their boundaries. Resultantly: fissures are created along the boundaries and inside the plates, which provide conduit to the underlying hot magma to escape towards the Earth's surface. In this volcanic eruption occurs



iv- EFFECTS OF VOLCANIC ERUPTION

a- Positive effects of Volcanic eruption

Volcanic eruption, a natural process, has certain positive effects.

1- It helps in the growth of new island in the ocean.

2- It also helps in bringing forth

regions with

the economic minerals like metals near the surface.

3- It also converts certain rocks to economic natural deposits like the conversion of limestone into marble.

4- Similarly, volcanism also helps the researchers to study Earth's interior and processes and explore any economic aspect for the public welfare.

b- Negative Effects of Volcanic Eruption:

~~Natural~~ Volcanic eruption is a natural hazard which can turn into a disaster depending upon its frequency, intensity and existing urbanization located nearby.

Volcanic eruption is generally involves ejection of large amount of soot, hazardous gases, and steam along with magma, which can cause air, water and land pollution.

Flowing lava may block the natural water pathways, highways, and railway lines.

Highly viscous flowing lava may destroy houses, buildings and other infrastructure.

In short, proper precautionary measures should always be taken

in areas of active volcanism to avoid its catastrophic consequences.

(b) **Renewable, non-renewable sources of Energy — Difference.**

Renewable and non-renewable sources of energy can be differentiated as follow:

i- RENEWABLE SOURCES OF ENERGY

Naturally occuring unlimited sources of energy which can be replenished in short span of time are called as renewable sources of energy.

Examples

Solar Energy, Wind energy, Tidal energy, etc.

ii- NON-RENEWABLE SOURCES OF ENERGY

Naturally occuring limited sources of energy which cannot be replenished in short span of time are called as non-renewable sources of energy.

Examples

Fossil fuels (Oil, gas), coal, Wood.

iii- Brief Note on Wind Energy, Solar Energy and Biofuels

a- Wind Energy

Energy obtained from the wind with the help of wind turbines is called as wind energy.
Pakistan possesses about 1100km long coastline and vast plain uninhabited areas, which have huge potential of wind energy to be harnessed.

b- Solar Energy

Energy obtained from the sunlight either directly for heating purpose or its conversion to electricity through photovoltaic cells is called solar energy.
Due to ideal geographic location in the sunny belt, Pakistan have huge opportunity to utilize solar energy. Presently a large number of households, markets, public offices and places are run by mini-solar power plants. However, 450 MW Quaid-e-Azam Solar Power Park is functional at Bahawalpur connected to the national grid.

c- Biofuels

Energy obtained from biological wastes is called biofuel energy; while those biological wastes are called biofuels

Many developed countries produce energy from biological wastes after segregation of useful substances. Bio-wastes are generally converted into useful products like ethanol and methane, which are then used to produce energy

(C) Tornado, Formation and Effects

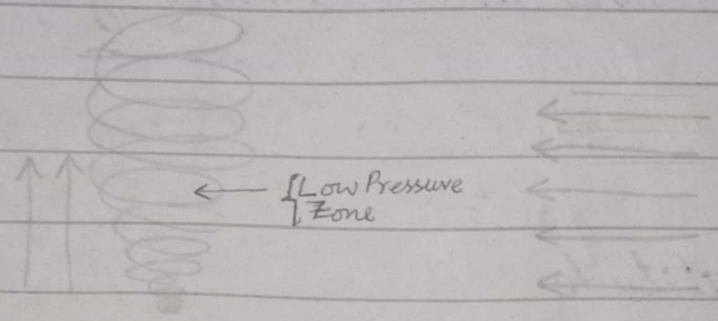
Answer i- TORNADO

Violent and fastly moving funnel-shaped wind circulation having very high speed and produced due to pressure gradient generated by the temperature difference is called as tornado.

ii- FORMATION OF TORNADO

Tornado is rapidly moving whirlwind. It produces generally due to very high pressure gradient and it is variation in ~~tem~~pressure of one

location as compared to other due to temperature difference. Very low pressure vaccum is produced due to high temperature at one place, while to fill this low pressure vaccum, winds from surrounding rush at high speed. Due to high temperature rushing wind also move upward leading to cause tornado.



Low Pressure Area and Location of formation of Tornado

Rushing wind from High Pressure area.

iii- Effects of Tornadoes

Tornadoes are fastly moving hazardous ~~with~~ windwhirls, which can have speed of even 400 km/hour. Moreover, their interior have extremely low pressure, which can suck and pull even very heavy bodies toward inside blowing them away.

Due to their such high speed and intensity, meteorological instruments cannot sustain and are blown away. Tornadoes also result accompanying heavy rainfall.

(d) Various factors affecting the variations in the climate of a place

Answer The climate of a place is affected by the variations in the following various factors:

i- Latitude

Sunlight vertically falls over the equator and resultantly, region on either side of the equator is warm relatively. While latitude increases away from the equator, therefore, low latitude areas are warmer than high latitude areas. Thus, variation in latitude affects temperature, which is an important parameter of climate. Tropical warm regions and polar cold regions are examples.

ii- Altitude

Temperature decreases with increasing altitude with respect to the sea level. Therefore, high altitude areas have cold climate as compared to lower ones. Low and freezing temperature of northern Pakistan is due to its location at high altitude.

iii- Distance from the Ocean

Coastal regions tend to be humid and cold due to least distance from the ocean. As ocean winds circulates and move towards land lowering its temperature. Therefore, distance from the ocean is important factor affecting the climate.

v- Direction of Wind Circulation

It is another important factor affecting climate. Areas with locations in the windward side - in the direction of circulating wind - have cold and humid climate as compared to the leeward side's areas.

vi- Miscellaneous factors affecting the variations in the climate of a place

Cloud cover, forests cover, surface water bodies, location on the either side of mountain chain, are other main factors which affect the variations in the climate of a place.