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Q.2 A. How Volcanoes Erupt

1. Introduction

The recent eruption of volcanoe in Iceland speaks louder about the intensity of climatic catastrophes. Although volcano eruption is a natural phenomenon, but in this case, it has been reported that the eruption was followed by a small serious of earthquake. Volcanoes are erupt when hot magma from the earth explode from the top of mountain in the form of lava.

2. Understanding Science of Volcanoes:

Volcanoes are large mountains that have hole. This hole is called 'Vent'. Vent is often at the top of volcanoe. Under these mountains — inside the earth there is a lot of hot molten rock. called Magma. When the pressure built the magma can erupt through the vent result in eruption of volcanoe.

3. Eruption of Volcanoes

When the pressure inside the earth is intense magma become too intense and rise up and explode out as lava.

lava along with it take gases and ashes outside. This is how it formed.

Other causes of volcano eruption are:

- Collision of Tectonic plates
- Hotspots
- Rift zones Meet-up
- Decompression Melting

4. Manifestation of Recent volcanoe Eruption

On 18th december a volcano erupted in South west Iceland. It swept lava and smoke across the wide area. According to the country's Meteorological report, since four weeks there were a continuos earthquake activity on small scale.

The authorities were able to evacuate nearly 5000 people. It caused a huge fire nearly 3 houses set alight (Aljazeera).

5. Conclusion:

To sum it up, volcanoes erupt due to the movement of tectonic pleter. For instance, in rift zones where pleter move apart, magma can rise to fill the gap leading to volcanic eruptions. Similarly when the pressure on the mantle rock decreases, the rock can melt and form magma. It result in eruption of volcanoes.

B@ Big Bang / Big Crunch - - -

1. Decoding Theory of Big Bang

Big bang is one of the authentic theory that define formation of the universe. According to Big bang, the universe about 13.8 billion years ago was inside a small point called singularity. It was in a **dense. infinite state.**

a. Expansion of the Universe

According to the Big Bang the universe started expanding before 13.8 billion years. and it is continuously expanding to this day.

b. Validity of Big Bang

This theory is widely accepted by scientists. It helps us in understanding the origin of the universe.

2. Analysing Big Crunch

A big crunch is hypothesis which says that **there is a matter in the universe whose gravitational pull is can halt the expansion of the universe.** It can cause collapse of the universe back in singularity.

4. Calculation of the Age of Universe:

Following are some of the important and well recognized methods of calculating age of the universe:

5. Measuring Rate of Expansion of the Universe:

This methods is known as Hubble constant which measure expansion rate, and then work backward to determine when expansion began. It draw relationship between distance and velocity of nearby galaxie.

6. By looking for the Oldest Star:

Another way of calculating age of the universe is by looking for the oldest star. The life cycle

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of a star depends on its mass. the bigger the star. the more chances of supernova are there

6. By Studying the Cosmic Microwave Radiation:

Under this way radiation is analyzed. This radiation in background is leftover radiation from the early stages of the universe.

Conclusion:

To sum it all. the origin of the universe is defined by Big Bang theory. The age of universe is approximately 13.8 billion years. It is calculated through various methods used by scientist.

C. Sources of Renewble Energy

1. The Science of Renewbles

Renewble sources of energy are those which can be replenished to the greatest scale for the benefit of human beings. There sources are often organic, cheaper and accessible. Renewbles sources of energy can be renewed at any time unlike non-renewbles such as petrolium and coal.

2. Sources of Renewble-Energy:

a. Solar Energy

refers to the energy drew by the Sun in the form of sunrays. It is conserve through converting sunlight into electricy ~~through~~ by using solar panels. **Germany and China** are leaders in solar power and its production. It is a very **clean** energy.

b. Wind Energy

In this source of energy **wind turbines capture kinectic energy** from wind and convert it into electricity.

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In Pakistan, there is a great potential for wind energy in coastal areas of Sindh and Baluchistan.

c. Biomass Energy

This energy is drived from organic matter i.e plants, waste material to produce electricity. Currently, **Brazil** is utilizing sugarcane waste at large pace to generate electricity.

d. Hydropower

In this renewble source of energy we use flowing **water** to create electricity. For instance, building of dams is often helps in producing electricity. Electricity in Norway is produced at large scale.

e. Tidel Energy

Lastly, tidal energy is another source of renewbles. **It harnesses the** power of tides using turbines to produce electricity. UK is also forefront in this type of energy.

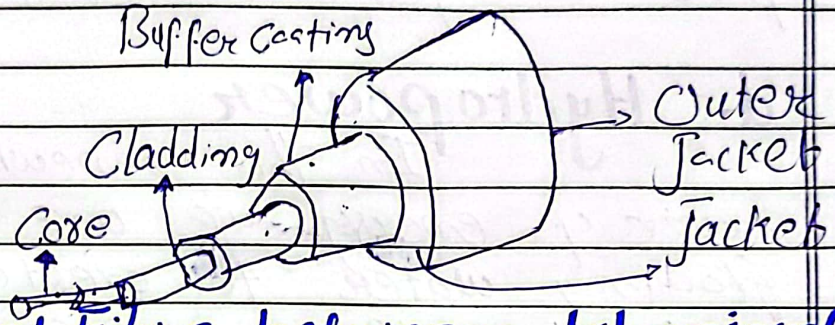
3. Conclusion.

All these sources can reduce our reliance on fossil fuels which are polluting the world.

d. How Optical Fibres work

1. Explaing Optic Fibre

An optical fibre is a thin flexible of cable that uses plastic or glass to transmit information in the form of light signals. It is used in telecommunication, internet etc.



2. Optical Fibre between Khunjareb and Rawalpindi

The optical Fibre (820 KM) is laid down between Khunjareb pass and Rawalpindi under the ambit of CPEC project is the groundbreaking. It will **bring 3G and 4G network connectivity** from China to Pakistan.

Moreover, it will connect the **Transit Europe-Asia Cable Networks** with that of Pakistan. Besides, it is currently transmitting its telecom. and internet through four undersea fibre optics cables.

3 Principal working of Optical Fiber:

Optical fiber use the principle of total internal reflection to transmit light signals over a long distances.

4. Composition of Fibre optics:

An optical fibre is

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made up of glass or plastic called optical fiber. It is a thin flexible strand with a core in the center surrounded by a cladding layer.

5. How Light Signals Undergoes total Internal Reflection:

When a light signals introduced in inner core of the Fiber it undergoes total internal reflection.

- The light rays bounce off between the core and cladding continuously reflecting back into the core as they travel.

6. Usage of optical Fiber:

An optical fiber is used in following applications:

- Telecommunications
- Internet
- Endoscopy or Medical
- Electronic sensors
- Audio video Transmission

Q# 3 A.

Ans

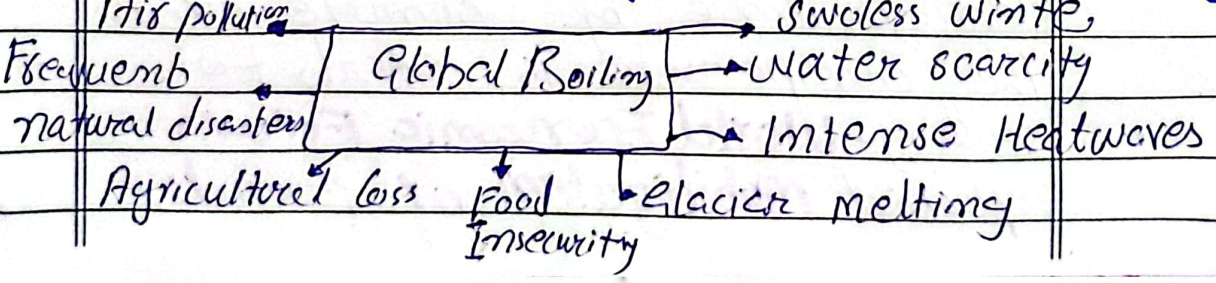
1. Introduction

The world community is experiencing transition from climate change to climate crisis. Rising earth's temperature has caused massive loss in term of melting glaciars and inducing climatic disasters such as urban floods and drought. As a result of it, developing countries like Bangladesh, Pakistan, India are bearing the hunt of global boiling. Contrary, the largest emmitters of GHGs including EU states, US, Russia China are growing economically and technologically on the back of developing states.

2. ADB An Alarming Report:

2023 has recorded as the hottest year according to Asian Development Bank. This is alarming mainly for developing states who are facing floods, droughts and smog which are posing a threat to human life. In this regard, the recent COP28 meeting affirmed fossil fuels as a major culprit. However, there is a huge gap between stated and practice of global emitters.

3. Repercussions of Global Warming.



4. Hurdles in ~~Implementing~~ tackling Impacts of Global Warming:

4.1 Inadequate Infrastructure

One of the major hurdle in addressing climatic catastrophes is insufficient infrastructure. For instance, if Pakistan loss $30 billion worth infrastructure i.e houses, livestock, agrarian land in 2022 flood, there is little to gain from loss and damage fund - 2023.

4.2 Lack of Support from Industrial countries

Moreover, negligible support from global emmitter is another hurdle in way of tackling impacts of global warming. This can be ascertained from Indias contribution in GHGs which is approximately 3.2%, whereas its support to prey countries is insufficient.

4.3 Poor Clean Development Mechanism

Besides, poor post-disaster management is another factor negatively results in crisis. For resilience and rehabilitation of damage done by climate crisis the compensate is nearly to nothing. World Economic Forum, reported mobilization of funds

via COP28 is 2% of the total ~~Loss~~ estimated.

5. Conclusion

All these hurdles creat distruhance in tackling with the severe impacts of climate change. Therefore, it is necessary to address these hurdles by practically applying pledges taken by states and non-state actors during Cop 28 in Dhubai.

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c) Balanced Diet Note

1 Describing Balance Diet

Balance diet refers to the fulfilment of all nutritional needs required by humen body. It comprises of essential food components which protects humen body against many disease such as malnutrition etc.

2. Importance of Balance Diet

Balance diet is very crucial for humans to work and live healthy life. In order to meinteain good health and balance diet is prerequisite.

'Let thy food be they medicine.'

3. Components of Balance Diet

Group I: Diary products (milk, cheese)
Group II: Grains (rice, bread)
Group III: proteins (beans, eggs)
Group IV: Vegetables/Fruits
Group V: Oils/Fats

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4. Functions of Balance Diet

a. Boosts Immune system

b. Protects against diseases

c. Helps to maintain body temperature

d. Helps in building tissues and muscles.

e. Gives energy to work

f. Regulate growth of body

g. provides all nutrients

h. Maintains healthy living

5. Disadvantages of Imbalanced Diet

a. Dificiency of Vitamens lead to accute disease like scurvey and Beri Beri

b. Taking unbalanced diet result in poor growth and health.

Q. AI Revolution:

Ans

1. Explaing Artificial Intelligence

Artificial Intelligence (AI) is a novel technology which enables machine to think and act like human. It is the field that encompases development of intelligent machines. It has revolutionized the world by incorporating itself in almost every field such as:

a. Application of AI in Present-Times

- Autonomous Vehicles
- Natural Linguistics Processing
- Cybersecurity
- Automization of Data Processing
- Robotic Surgery
- E-Commerce
- Agriculture
- Environmental Monitoring
- Manufacturing Industry

2. Evidences of Revolutionary Occurence due to AI

It has revolutionized today's world in numerous ways via its applications.

1) For example: In medical field it has enabled early disease detection by accurately providing ~~data~~ diagnostic data.

2) Moreover it has transformed transportation sector by developing self-driving cars.

3) Besides, AI has revolutionized communication by creating machines that can respond to human language. Such as google voice record ~~etc~~ and chatbots etc.

4) Lastly, AI has transformed the present world by shifting nearly all manual work to computer or online system.

3/ d. — — — —

1. Introduction:

ROM and RAM are two types of computer memory that store data. These memories contain instructions and are essential for the operation of computer. RAM allows computer to quickly access data and store data ~~while~~ while ROM holds more important instructions read by CPU.

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2. Key Differences

ROM	RAM
• Read only Memory	Random Access Memory.
=> Has permenant storage	has temporary storage
=> Is non-volatile	Is volatile which mean it can be changed.
=> It is hardwired in computer	It is in small chip-size
=> Used by computer before the operation of software	Used while computer is on
=> This can be read by CPU only	It is used to increase speed of computer
=> Retains data when the computer is even off	Helps in running multiple applications simultaneously:
=> Helps in reading data	Gets cleared when computer is off

Q. 8

C. Correct words

1) ~~Hrios~~

1) SHIRT

3) ONLINE

2) DANGER

4) HOLIDAY

5) SMATCH

b. Series

A. 4, 16, 36, 64, (100), 144 ..

b) 30, 29, 27, (24), 20, 15

c. 48, 24, 72, 35, 108, (54).

c) 1, 7, 15, 25, (37), 51

d) 0, 2, 6, 12, 20, 30, (42).