

Q No. 2

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Introduction

The key features of the COP-28 were quite different this time. COP-28 took place in Dubai, UAE from 12 December onwards. Many things were discussed among the parties including the issue of Loss and Damage fund, building climate resilience, ending the use of fossil fuels for developed and developing countries.

Key Features of COP-28

1) Transitioning Away From Fossil Fuels

One of the things that were discussed in the COP-28 was the discussion of completely ending the use of fossil fuels by developing and developed countries. Fossil fuels being the main contributor to climate change and global warming ^{its reduction} will help developing countries and developed countries to reduce the severity of climate disasters. The commitment was also included which is the first "global stocktake" of how countries can accelerate action to meet the goals of Paris Agreement.

2) Fast-tracking the energy transition

In COP-28 countries were called to transition themselves to green energy, food and agricultural system so that environment can be saved and there is less damage to the earth's atmosphere.

3) Inclusivity in climate management

Another goal that was achieved was the inclusivity of different countries towards climate management. Not just only this, but focus was also done on the involvement of youth in the process of saving the environment.

4) Climate Finance Solutions

Pressure is building on wealthy countries to meet commitments to fund energy transitions and a loss and recovery fund for vulnerable nations.

Loss and Damage fund

In COP-28 loss and damage fund was a hot topic as countries were again requested to deposit 100 Billion dollars before 2030. However these 100 Billion are also insufficient as compared to the loss faced by countries from climate change. The commitment is again renewed, but it requires strong accountability mechanism.

Financial Issues of developing Countries

1) Lack of funds

Developing countries continuously face a financial crunch and they need money to develop themselves and once development is done then they can think about the matters related to climate change.

2) Lack of foreign investments

Developing countries face a financial crunch due to having minimal foreign investments in their country and if foreign direct investment increases, it can be used to build climate resilience and adaptation.

Conclusion

COP is held every year to discuss on climate related issues and also where we currently stand to reach the Paris agreement. Loss and damage fund and the complete shift from fossil fuels were two key features of this year COP. However, loss and damage fund is a major issue which needs to be taken care of.

① No 2

B)

Solid Waste Management refers to the process through which the waste that is produced domestically or industrially is managed in such a manner that it harms less to the environment. Solid Waste Management refers to the systematic collection, transportation, disposal and recycling of solid waste.

Different Methods of Solid Waste Management

1) Landfill

The municipal solid waste is mainly disposed of by dumping it into a landfill. The landfill is digging a large hole in the ground after dumping off the waste material the hole should be enveloped. There should be careful site selection pre-hand disposal as the waste can harm the environment. The selection of a landfill type depends on the type of waste that will be disposed off.

2) Incineration

It is a waste treatment process in which solid waste is burned at high temperature varying at 900-1000 degree Celsius. The advantages of this method is that it reduces the bulk volume of the waste and the heat of combustion can be used to run a turbine to produce electricity.

3) Pyrolysis of Solid Waste

Pyrolysis is rapidly developing biomass thermal conversion technology and it provides an opportunity for the conversion of municipal solid wastes, agricultural residues, scrap tires, non-recyclable plastics into clean energy. ~~(It is)~~ Pyrolysis is the thermal degradation of organic materials in the absence of oxygen and the process also requires an external heat source to maintain the high temperature.

Q No 2

c)

A balanced diet is a key component of maintaining good health and well-being. It involves consuming a variety of foods in appropriate proportions to provide the necessary nutrients that the body needs for optimal function. A balanced diet ensures that an individual receives adequate amount of carbohydrates, proteins, and fats.

Carbohydrates: Carbohydrates are the body's primary source of energy. They provide fuel for various body functions and some examples of carbohydrates are whole grains, fruits and vegetables.

Proteins: Proteins are crucial for the growth, repair and maintenance of body tissues. They play a key role in formation of enzymes, hormones and antibodies. Examples are meat, poultry and fish.

Fats: Fats are essential for the absorption of fat soluble vitamins (A, D, E and K) and serve as a concentrated source of energy. Examples are avocados, nuts and olive oil.

Vitamins: are essential for various physiological processes, including immune function, metabolism and cell growth. Sources are fruits and vegetables.

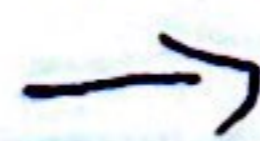
Minerals: Minerals play a vital role in bone health, fluid balance, nerve function and formation of red blood cells. Examples are leafy greens, nuts and seeds.

Q No 2

d) China-Pakistan Economic Corridor is the flagship project of the Belt and Road Initiative launched by China. The project has made very significant contributions to Pakistan's economy and since its announcement the project has gone through many different phases. There are three renewable energy reserves that have been implemented under CPEC initiative.

1) Hydropower

Indus Cascade: The CPEC initiative has included plans for the development of hydropower projects along the river Indus. These projects tap into the vast hydropower potential of Pakistan utilizing water for electricity generation.



2. Solar Energy Quaid-e-Azam Solar Park

Located in Bahawalpur, Pakistan, the Quaid-e-Azam Solar Park is one of the largest solar power projects in the country and has received support under the CPEC framework.

3. Wind Energy Thimpir Wind Power Projects

The Thimpir Wind Corridor in Sindh province is known for its high wind potential. Several wind power projects have been initiated in the region, supported by the CPEC initiative.

Q4
A)

Earthquakes and tsunamis are natural disasters that can have devastating effects, but they are distinct phenomena.

Generation of Earthquakes
Tectonic Plate Movements: Earthquakes are primarily generated by the movement of tectonic plates beneath the earth's surface. At plate boundaries, stress can build up along faults when plates become locked due to friction. When the stress increases, it leads to the sudden release of energy in the form of seismic waves.

Generation of Tsunamis

Underwater Earthquakes or Volcanic Activity: Tsunamis are often triggered by underwater earthquakes or volcanic eruptions. When there is a sudden vertical movement of the seafloor due to tectonic activity, it displaces a large volume of water.

Key Differences

1. Cause:

Earthquakes: Results from sudden release of energy due to tectonic plate movement, causing the earth's crust to shake.

Tsunamis: Often triggered by underwater earthquakes, volcanic eruptions or other underwater disturbances that displace large volumes of water.

2. Nature of Phenomenon

Earthquakes: Involves the shaking or vibrating of the earth's crust.

Tsunamis: Involves the displacement of water, leading to the generation of powerful ocean waves.

3. Transmission of Energy

Earthquakes: Release seismic waves that travel through the earth.

Tsunamis: Generate ocean waves that travel across the ocean surface.

Q4

B) The Coriolis Force is an apparent force that acts on a mass moving in a rotating system, such as the earth. It is responsible for the deflection of moving objects, including air masses and ocean currents, on the rotating earth. The Coriolis force arises due to the rotation of the earth and is influenced by the speed and direction of the moving object. The Coriolis force is more pronounced at higher altitudes and is zero at the equator.

Generation of Hurricanes:

Hurricanes, also known as cyclones or typhoons in different regions, are powerful tropical storms characterized by low pressure centers, high winds and heavy rainfall.

Key steps in the formation of hurricanes

1.) Warm Ocean Waters:

Hurricanes form over warm ocean waters as the warm water provides the necessary heat and moisture to the storm.

2.) Formation of Low-Pressure Systems

Warm air at the ocean surface rises, creating an area of low pressure. As more is drawn into the low-pressure system, it continues to rise and create a cycle of air circulation.

- 3) Coriolis Effect: It comes into play as the rising air begins to rotate due to the earth's rotation.
- 4) Formation of Tropical disturbance: As the rotating system gains strength and organization, it evolves into a tropical disturbance.
- 5) Tropical depression and storm: When the system intensifies further, with sustained winds reaching a certain threshold, it becomes a tropical depression and then a tropical storm.
- 6) Hurricane formation: When the storm's wind speeds reach a specific level, it is classified as a hurricane.

Q4

- c) Solar and lunar eclipses are celestial events that occur when the earth, the Moon, and the sun align in specific ways, resulting in the obstruction of light from one celestial body to another.

Solar Eclipse and Lunar Eclipse

- 1) Position of Celestial bodies
Solar eclipse occurs when the moon passes between the earth and the sun.
Lunar eclipse occurs when the earth comes between the sun and the moon.
- 2) Visibility:
Solar eclipse is visible only from specific locations on the earth where the moon shadow falls.

Lunar eclipse visible from any location on the nighttime side of the earth where the moon is above the horizon.

Frequency:

Less frequent than lunar eclipses. On an average two to five solar eclipses a year.

Lunar eclipses more frequent than solar eclipses. There are, on average, two to six lunar eclipses a year.

Section II

Q6

a) Son's age = x

Five years ago the son's age was $x-5$ and father age was $F-5$. At that time, the father's age was three times the age of the son.

$$F-5 = 3(x-5)$$

Currently, son is 30 years old

$$F-5 = 3(30-5)$$

$$F-5 = 3(25)$$

$$F-5 = 75$$

$$F = 75 + 5$$

$$F = 80$$

Father age is 80

b) Mean = $\frac{10+30+y+50}{4}$

$$50 = \frac{10+30+y+50}{4}$$

Date _____

$$S_0 = \frac{90 + y}{4}$$

$$200 = 90 + y$$

$$90 + y = 200$$

$$y = 200 - 90$$

$$y = 110$$

d) i) 2, 6, 18, 54, 162

(ii) 3125, 256, 16, 4, 1

D) Two numbers: x and y

i) product of two numbers is 320: $xy = 320$

ii) The ratio of the two numbers is 1:5: $\frac{x}{y} = \frac{1}{5}$

$$\left(\frac{1}{5}y\right) \cdot y = 320$$

$$\frac{y^2}{5} = 320$$

$$y^2 = 1600$$

$$\sqrt{y} = \sqrt{1600}$$

$$y = 40$$

$$x = \frac{1}{5}y$$

$$x = \frac{1}{5}(40)$$

$$x = 8, y = 40$$

Difference between squares

$$40^2 - 8^2 = 1600 - 64 = 1536$$

Q1 a)

$$\text{Both scooters} = 2 \times 96000 = 192000$$

$$1.2 \times C + 0.8 \times C = 192000$$

Combine like terms

$$2 \times C = 192000$$

$$C = \frac{192000}{2} = 96000$$

$$\text{Total sell.p price: } 1.2 \times C + 0.8 \times C = 1.2 \times 96000 +$$

$$0.8 \times 96000 = 115200 + 76800 = 192000$$

$$\text{Total Cost price: } 2 \times C = 2 \times 96000 = 192000$$

Gain or loss Percentage

$$= \left(\frac{\text{T.S.P} - \text{T.C.P}}{\text{T.C.P}} \right) \times 100$$

$$\text{Gain or loss percentage: } \left(\frac{192000 - 192000}{192000} \right) \times 100$$

$$= 0\%$$

B) Work = Rate \times time

First Scenario

$$195 \times 10 \times 20 = \text{Work}$$

Second Scenario

$$N \times 13 \times 15 = \text{Work}$$

$$195 \times 10 \times 20 = N \times 13 \times 15$$

$$39000 = 195N$$

Divide both sides by 195

$$N = \frac{39000}{195}$$

$$N = 200 \rightarrow 200 \text{ Men required}$$

Date _____

$$D) V = \frac{1}{3} \times \text{Base Area} \times \text{Height}$$

$$372 \text{ cm}^3 = \frac{1}{3} \times s^2 \times 300.000 \text{ cm}$$

$$s^2 = \frac{3 \times 372}{300.000}$$

$$s^2 = \frac{1116}{300.000}$$

$$s^2 = \frac{186}{50.000}$$

$$s^2 = \frac{93}{25000}$$

$$s = \sqrt{\frac{93}{25.000}}$$

Now the perimeter of the square base is given by

$$P = 4s$$

$$P = 4 \times \sqrt{\frac{93}{25000}}$$

$$P = 0.56$$