

NCERT MOST IMPORTANT QUESTIONS CLASS – 11

GEOGRAPHY CHAPTER- 11 WORLD CLIMATE AND CLIMATE CHANGE

Question 1.

Explain why the tropical humid climate is found in an irregular belt of 20° to 40° latitudes.

Answer:

The tropical belt extends across the two tropics, viz., Tropic of Cancer and Tropic of Capricorn in Northern and Southern hemisphere respectively. It is one of the belts which, for part of the year, comes under the influence of trade winds but for the rest of the year is subjected to conventional rain. Moreover, the trade winds which blow from north-east and southeast also bring a considerable amount of rainfall.

Question 2.

What could be the possible consequences of the continued addition of carbon dioxide and methane gases to the atmosphere?

Answer:

The continued addition of carbon dioxide and methane gases to the atmosphere will increase the atmospheric temperature to an extent that it will cause ice to melt in the Arctic Ocean and in Antarctica. As a result, sea levels will rise causing the drowning of central lowlands and islands, altering rainfall and evaporation patterns, creating new plant diseases and part problems, and enlarging the ozone hole. Enlargement of the ozone hole, in turn, will cause more and more ultraviolet radiation to reach the earth's surface, leading to a further rise in temperature of the lower layers of the atmosphere.

Question 3.

Match the following :

S.no.	Symbol	Climatic Group
1.	A	(a) Polar climate
2.	C	(b) Subtropical
3.	D	(c) Tropical Humid
4.	E	(d) Boreal
5.	F	(e) Temperate
6.	B	(f) Dry

Answer:

S.no.	Symbol	Climatic Group
1.	A	(c) Tropical Humid
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Question 4.

Discuss the bases of climatic classifications of Koeppen and Thornthwaite.

Answer:

Koeppen's classification is based upon annual and monthly means of temperature and precipitation. Native vegetation was considered as the best expression of the totality of climate. Similarly, Thornthwaite followed Koeppen's principle that plant is nature's meteorological instrument capable of integrating climatic elements like precipitation effectiveness and potential evapotranspiration.

Question 5.

Discuss the aims and objectives of Trewartha's classification.

Answer:

Trewartha believed that people who need to understand and use the climatic environment for their own purposes should have the parts of climate presented realistically. At the same time, he also recognized the merits of the genetic type of climatic classification. According to him, "genetic not only increases interest and adds to the scientific quality of climatic analysis, but also gives an extra dimension of insight to the student's understanding of the description." Genetic classification of climates emphasizes the causes or origin of their formation based on weather processes.

Question 6.

Give an account of any four factors which control the climate of a region.

Answer:

These are the following factors that control the climate of a region :

1. **Altitude:** Regions on the higher altitude have a cold climate and on the lower altitude have a warm climate.
2. **Location:** The climate of a region depends on the location of that region. If the location is close to the equator, the climate will be hot and wet.
3. **Distance from the sea:** Regions that are closer to the sea have a moderate climate and others have an extreme type of climate.
4. **The direction of the mountains:** The extension of the Himalayas does not allow the cold winds of Central Asia into India and the temperature of India does not come down.

Question 7.

Describe in brief Koeppen's classification of climate.

Answer:

Koeppen's classification is strictly empirical as it is neither based on weather process (wind belt, air masses, fronts, and storms) nor does it emphasize causes of formation of climatic type. The classification is based upon annual and monthly means of temperature and precipitation. Natural vegetation is considered the best expression of the totality of climate. On the basis of the climate needs of certain types of vegetation, Koeppen identified five major groups: A to E, to which he added a sixth category of mountain zone (H).

'A' is the tropical zone, with a temperature exceeding 20°C all the 12 months.

'B' is the sub-tropical zone, where for 4 to 11 months temperature exceeds 20°C, and for 1 to 8 months the temperature ranges between 10° to 20°C.

'C' is the temperate zone, where the temperature ranges between 10° to 20°C for 4 to 12 months.

'D' is the cold zone, with temperature ranging between 10° to 20°C for 1 to 4 months and below 10°C for 8 to 11 months.

'E' is the polar zone, where the temperature remains below 10°C throughout the year.

These major climatic groups were sub-divided on the basis of variation in rainfall and temperature characteristics.

Question 8.

Discuss the global climatic changes in detail.

Answer:

The atmosphere is well structured and fairly dynamic in nature. The dynamism is more complex near the earth's surface where the changes take place both spatially and temporally. These changes may be induced internally within the earth's atmospheric system or externally by extra-terrestrial factors. Some of these changes are the results of human intervention and, hence, may be slowed down by human efforts. Global warming is one of the changes caused by man's continual and growing introduction of carbon dioxide as well as some other so-called greenhouse gases, like carbon and chlorofluorocarbon, into the atmosphere.

The atoms and molecules of atmospheric gases cause absorption and back radiation of sunlight by the greenhouse gases, especially water, carbon dioxide, and methane. The concentration of water in the atmosphere is controlled by evaporation from oceans. Carbon dioxide is introduced into the atmosphere by volcanism. Methane is produced by the metabolization of bacteria in wood/grass-eating animals.

Human activities also add methane and carbon dioxide to the atmosphere by burning fossil fuels and by various agricultural activities.

The carbon dioxide contents of the atmosphere play a dominant role in causing worldwide climatic changes. The gas is transparent to incoming solar radiation but absorbs outgoing long-wave terrestrial radiation. This absorbed terrestrial radiation is radiated back to the earth's surface. Thus, it is clear that any appreciable change in carbon dioxide content would bring about a change in temperature in the lower layers of the atmosphere. Methane, which rapidly gets oxidized into carbon dioxide, is 20 times more effective than CO₂.

Rapid industrialization and technological changes, a revolution in agriculture and transport sectors have resulted in large supplies of carbon dioxide, methane and chlorofluorocarbon gases into the atmosphere.

Of the many climatic parameters, the temperature is the most affected one due to urbanization and industrialization. The thermal characteristics of urban areas are in marked contrast to those of the surrounding countryside.

Man is considered as an engine of climatic change. In support of this, rice farmers, coal miners, dairy farmers, and shifting agriculturists contribute their rate in global warming.

Question 9.

Describe the advantages of Trewartha's classification over Koeppen's classification.

Answer:

On the basis of grouping, climate types are either genetic or empirical. Genetic classification emphasizes the causes or origin of their formation based on weather processes. The empirical classification, on the other hand, is based on observation related to factors for climatic differentiation.

Koeppen's classification is strictly empirical as it is neither based on weather process nor does it emphasize causes of formation of climatic type. The classification is based upon annual and monthly means of temperature and precipitation. Natural vegetation is considered the best expression of the totality of climate. Koeppen followed the principle that plant is nature's meteorological instruments capable of integrating climatic elements like precipitation effectiveness and potential evapotranspiration.

The climate classification system devised by G.T. Trewartha represents a compromise between purely empirical and genetic methods. Besides being simple and explanatory, it combines the fundamentals of the empirical as well as genetic classification schemes. Trewartha, while proposing his climatic classification, was conscious of the fact that the classification systems of Koeppen, being based on certain statistical parameters, of a few weather elements, were cumbersome and complex. The empirical quantitative classification system, as devised by the author, produced such a large number of climatic types and sub-types that it was rather too difficult to remember them. Keeping this aspect in view, Trewartha recognized only a limited number of climatic types, i.e., 6 major types and 10 sub-types.

The major climatic groups included: Tropical humid climate

- (A) Dry climate
- (B) Sub-tropical
- (C) Temperate climate
- (D) Boreal climate
- (E) Polar climate
- (F) Each of these, except Boreal
- (E) the climate has two sub-types.

Question 10.

Write a note on temperate climates.

Answer:

The temperate climate is found in the vast landmasses of middle latitudes (40° and 65°). This climatic band of severe winters is found between the sub-tropical and boreal type of climates.

The two sub-types of temperate climate are temperate marine and temperate continental. They are primarily demarcated on the basis of summer temperatures.

The temperate marine climate has mild winters and fairly warm i- summers. Throughout the year, the average temperature is above 0°C. Rainfall is experienced throughout the year. This type of climate is found on the western sides of continents in the temperate zone.

The temperate continental climate is found in the interior of the continents in middle latitudes. The impact of land is visible as it is characterized by harsh winters and cool summers. The extreme cooling of the ground is associated with anticyclones. Annual precipitation is low, though it takes place throughout the year. This type of climate is found in north-eastern Asia, eastern Canada, and Eurasia.