

Climate & Atmosphere: Advanced MCQs for NDA

1. Consider the following statements regarding the structure of the atmosphere:

1. The **Troposphere** is the layer where all weather phenomena occur.
2. The **Stratosphere** contains the Ozone layer and is characterized by a decrease in temperature with height.
3. The **Ionosphere**, a part of the Thermosphere, reflects radio waves back to Earth.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 1 and 3 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

2. With reference to the composition of the atmosphere, which of the following is/are correct?

1. **Nitrogen** is the most abundant gas and is crucial for balancing oxygen.
2. **Oxygen** is essential for respiration and combustion.
3. **Argon** is the third most abundant gas.

Select the correct answer using the code given below:

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

3. The 'Greenhouse Effect' is a natural process vital for life on Earth. However, its recent intensification is primarily due to the anthropogenic increase of which of the following gases?

1. Carbon Dioxide (CO₂)
2. Methane (CH₄)
3. Chlorofluorocarbons (CFCs)

Select the correct answer using the code given below:

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

4. Consider the following statements about 'Weather' and 'Climate':

1. **Weather** refers to the short-term atmospheric conditions of a specific place.
2. **Climate** is the long-term average of weather patterns over several decades.
3. Climate is what you expect; weather is what you get.

Which of the statements given above are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

5. The inversion of temperature, where temperature increases with altitude, is a characteristic feature of the:

- (a) Troposphere
- (b) Stratosphere
- (c) Mesosphere
- (d) Thermosphere

6. The pressure belts on Earth are formed due to:

1. The differential heating of the Earth.
2. The rotation of the Earth (Coriolis Force).
3. The gravitational pull of the Moon.

Select the correct answer using the code given below:

- (a) 1 only

- (b) 1 and 2 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

7. The 'Doldrums' is a zone of low pressure characterized by:

- (a) Strong and steady trade winds
- (b) Frequent cyclones and storms
- (c) Calm and light variable winds
- (d) High-velocity westerly winds

8. The 'Roaring Forties', 'Furious Fifties', and 'Screaming Sixties' are names given to the:

- (a) Polar Easterlies in the Northern Hemisphere
- (b) Strong Westerly winds in the Southern Hemisphere
- (c) Trade winds over the oceans
- (d) Jet streams in the upper troposphere

9. The Indian Monsoon is best described as a:

- (a) Modified system of the planetary winds
- (b) Local wind phenomenon
- (c) Type of cyclonic storm
- (d) Seasonal reversal of winds

10. The 'El Niño Southern Oscillation (ENSO)' phenomenon is associated with:

- (a) Warming of the Pacific Ocean near Peru
- (b) Cooling of the Pacific Ocean near Peru
- (c) Increased monsoon rainfall in India
- (d) Formation of cyclones in the Atlantic

11. A 'Cyclone' in the Northern Hemisphere is characterized by:

- (a) Anticlockwise wind circulation and low pressure at the center
- (b) Clockwise wind circulation and low pressure at the center
- (c) Anticlockwise wind circulation and high pressure at the center
- (d) Clockwise wind circulation and high pressure at the center

12. Consider the following statements about 'Anti-cyclones':

1. They are associated with clear skies and stable weather conditions.
2. In the Southern Hemisphere, winds blow clockwise around them.
3. They are characterized by high atmospheric pressure at the center.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 1 and 3 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

13. The term 'Relative Humidity' refers to the:

- (a) Total amount of water vapor present in the atmosphere
- (b) Ratio of the air's actual water vapor content to its maximum water-holding capacity at a given temperature
- (c) Amount of water vapor required to saturate the air
- (d) Temperature at which the air becomes saturated

14. Which of the following types of rainfall occurs when warm, moist air is forced to rise over a mountain range?

- (a) Convictional Rainfall
- (b) Orographic Rainfall
- (c) Cyclonic Rainfall
- (d) Frontal Rainfall

15. The 'Jet Streams' are high-altitude, narrow bands of strong wind. Their existence is primarily influenced by:

1. Pressure gradient force
2. Earth's rotation
3. Solar radiation

Select the correct answer using the code given below:

- (a) 1 only
- (b) 1 and 2 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

16. The 'Inter-Tropical Convergence Zone (ITCZ)' is a low-pressure zone where:

- (a) The polar easterlies and westerlies converge
- (b) The northeast and southeast trade winds converge
- (c) The trade winds and westerlies converge
- (d) The monsoon winds originate

17. The 'Polar Front' theory is associated with the origin of:

- (a) Tropical Cyclones
- (b) Temperate Cyclones
- (c) Anticyclones
- (d) Thunderstorms

18. The 'Nor'westers' (Kalbaisakhi) of West Bengal and Assam are which type of weather phenomenon?

- (a) Orographic Rainfall
- (b) Frontal Rainfall
- (c) Convectional Rainfall
- (d) Cyclonic Rainfall

19. Consider the following statements about temperature distribution:

1. The **Isotherms** are lines joining places having equal temperature.
2. The **Annual Range of Temperature** is higher in the interiors than on the coasts.
3. The **Inversion of Temperature** is common in mountainous areas during nights.

Which of the statements given above are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

20. The 'Loo' is a hot, dry wind blowing during the summer months over the:

- (a) Eastern coastal plains of India
- (b) Northern and northwestern plains of India
- (c) Western Ghats
- (d) Himalayan region

21. The 'Mango Showers' are pre-monsoon showers in Karnataka and Kerala that help in the ripening of mangoes. They are a type of:

- (a) Orographic rainfall
- (b) Convectional rainfall
- (c) Cyclonic rainfall
- (d) Frontal rainfall

22. The primary factor responsible for the formation of 'Fog' is:

- (a) Advection of warm air over a cold surface
- (b) Intense heating of the ground
- (c) Rapid ascent of air in a low-pressure system
- (d) The cooling of air to its dew point

23. The 'Chinook' wind is a warm, dry wind that descends the eastern slopes of the Rocky Mountains. It is an example of a:

- (a) Cold local wind
- (b) Hot local wind
- (c) Föhn wind
- (d) Trade wind

24. The 'Coriolis Force' is responsible for:

- (a) Deflecting winds to the right in the Northern Hemisphere
- (b) Causing differences in atmospheric pressure
- (c) Driving the monsoon winds
- (d) The formation of clouds

25. The 'Planetary Winds' include:

1. Trade Winds
2. Westerlies
3. Polar Easterlies

Select the correct answer using the code given below:

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

26. The 'Breaking of the Monsoon' in India refers to the:

- (a) Arrival of the first monsoon rains
- (b) Withdrawal of the monsoon
- (c) Period of heavy rainfall in July-August
- (d) Dry spells during the monsoon season

27. The 'Thermal Equator' is:

- (a) The geographic equator
- (b) The line joining places of highest mean temperature
- (c) The line where trade winds meet
- (d) The boundary of the tropics

28. The 'Horse Latitudes' are located at approximately:

- (a) 0° latitude
- (b) 30° N and S
- (c) 60° N and S
- (d) 90° N and S

29. The 'Polar Easterlies' blow from:

- (a) The polar high-pressure towards the sub-polar low-pressure
- (b) The sub-polar low-pressure towards the polar high-pressure
- (c) The equator towards the poles
- (d) The west towards the east

30. The 'Sea Breeze' blows:

- (a) From sea to land during the night
- (b) From land to sea during the day
- (c) From sea to land during the day
- (d) From land to sea during the night

31. The 'Land Breeze' blows:

- (a) From sea to land during the night
- (b) From land to sea during the day
- (c) From sea to land during the day
- (d) From land to sea during the night

32. The 'Dew Point' is the temperature at which:

- (a) The air is completely dry
- (b) The air becomes saturated and condensation begins

- (c) The maximum evaporation occurs
- (d) The relative humidity is 50%

33. The 'Ozone Layer' is found in the:

- (a) Troposphere
- (b) Stratosphere
- (c) Mesosphere
- (d) Thermosphere

34. The 'Montreal Protocol' is an international treaty designed to protect the ozone layer by phasing out the production of:

- (a) Greenhouse gases
- (b) Ozone-depleting substances
- (c) Acid rain precursors
- (d) Radioactive materials

35. The 'Kyoto Protocol' was an international agreement that aimed to:

- (a) Reduce the emission of greenhouse gases
- (b) Protect the ozone layer
- (c) Regulate the trade of endangered species
- (d) Control the spread of nuclear weapons

36. The 'Paris Agreement' within the UNFCCC aims to:

- (a) Limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels
- (b) Phase out all fossil fuels by 2030
- (c) Establish a world government for climate action
- (d) Provide financial aid only to developed countries

37. The 'IPCC' (Intergovernmental Panel on Climate Change) is a scientific body under the auspices of the:

- (a) United Nations
- (b) World Bank
- (c) World Meteorological Organization
- (d) International Monetary Fund

38. The 'National Action Plan on Climate Change (NAPCC)' in India includes which of the following missions?

1. National Solar Mission
2. National Mission for Enhanced Energy Efficiency
3. National Water Mission

Select the correct answer using the code given below:

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

39. The 'Green Climate Fund' was established under the:

- (a) UNFCCC
- (b) Kyoto Protocol
- (c) Montreal Protocol
- (d) Paris Agreement

40. The 'Conference of the Parties (COP)' is the supreme decision-making body of the:

- (a) United Nations
- (b) UNFCCC
- (c) World Bank
- (d) IMF

Answer Key

1. (b) 1 and 3 only (Temperature increases with height in the Stratosphere)
2. (d) 1, 2 and 3
3. (d) 1, 2 and 3
4. (d) 1, 2 and 3
5. (b) Stratosphere
6. (b) 1 and 2 only
7. (c) Calm and light variable winds
8. (b) Strong Westerly winds in the Southern Hemisphere
9. (d) Seasonal reversal of winds
10. (a) Warming of the Pacific Ocean near Peru
11. (a) Anticlockwise wind circulation and low pressure at the center
12. (b) 1 and 3 only (In the Southern Hemisphere, winds blow anticlockwise around a cyclone and clockwise around an anticyclone)
13. (b) Ratio of the air's actual water vapor content to its maximum water-holding capacity at a given temperature
14. (b) Orographic Rainfall
15. (b) 1 and 2 only
16. (b) The northeast and southeast trade winds converge
17. (b) Temperate Cyclones
18. (c) Convectional Rainfall
19. (d) 1, 2 and 3
20. (b) Northern and northwestern plains of India
21. (b) Convectional rainfall
22. (d) The cooling of air to its dew point
23. (c) Föhn wind (a type of rain-shadow wind)
24. (a) Deflecting winds to the right in the Northern Hemisphere
25. (d) 1, 2 and 3
26. (a) Arrival of the first monsoon rains
27. (b) The line joining places of highest mean temperature
28. (b) 30° N and S
29. (a) The polar high-pressure towards the sub-polar low-pressure
30. (c) From sea to land during the day
31. (d) From land to sea during the night
32. (b) The air becomes saturated and condensation begins
33. (b) Stratosphere
34. (b) Ozone-depleting substances
35. (a) Reduce the emission of greenhouse gases
36. (a) Limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels
37. (a) United Nations
38. (d) 1, 2 and 3
39. (a) UNFCCC
40. (b) UNFCCC