5.WEATHER AND CLIMATE

SOLUTIONS

TEACHING TASK

JEE MAINS LEVEL QUESTIONS
Multiple Choice Questions

1. How do we measure humidity in Activity 8?
A) By observing evaporation B) By using a thermometer
C) By counting raindrops D) By analyzing cloud formations
Answer:A
Solution:Humidity is indirectly estimated by the rate of evaporation (e.g., how fast water dries from a surface).
2. What does climate refer to?
A) Daily weather changes B) Long-term weather patterns
C) Seasonal variations D) Weather observations by elders
Answer:B
Solution:Climate is the average weather pattern of a place over a long period (typically 30 years or more).
3. What is used to measure the highest and lowest temperatures of the day in Activity 4?
A) Anemometer B) Rain gauge C) Maximum-minimum thermometerD) Barometer
Answer:C
Solution:Maximum-minimum thermometer records the daily maximum and minimum temperatures.
4. How do farmers estimate rainfall traditionally?
A) Using a rain gauge B) By observing cloud formations
C) Through soil wetness observation D) By consulting meteorological reports
Answer:C
Solution:Farmers traditionally estimate rainfall by checking soil moisture or using simple containers (not standardized rain gauges).
5. What is the purpose of using an arrow setup or anemometer?
A) To measure rainfall B) To determine wind direction
C) To record humidity levels D) To measure temperature changes
Answer:B
Solution:An arrow setup (wind vane) or anemometer detects wind direction (and speed, in anemometers).
6. What is the primary purpose of a rain gauge?
A) To measure wind speed B) To estimate temperature changes
C) To measure humidity levels D) To measure the exact amount of rainfall
Answer:D
Solution:A rain gauge collects and measures precipitation (rainfall) in millimeters/inches over a period.

7. How is humidity related to weather conditions?
A) Higher humidity leads to cooler temperatures
B) Lower humidity leads to drier weather
C) Humidity affects wind speed
D) Humidity influences cloud formation
Answer:D
Solution:High humidity $\rightarrow$ More water vapor $\rightarrow$ Cloud formation and potential rain.
8. What is the primary function of a maximum-minimum thermometer?
A) To measure wind direction
B) To measure the highest and lowest temperatures
C) To estimate rainfall intensity
D) To measure humidity levels
Answer:B
Solution:It records daily temperature extremes (max/min) using a specialized scale.
9. How do farmers traditionally estimate rainfall?
A) Using a rain gauge
B) By observing cloud formations
C) Through soil wetness observation
D) By consulting meteorological reports
Answer:C
Solution:Farmers traditionally estimate rainfall by checking soil moisture or using simple containers (not standardized rain gauges).
10. What is used to determine wind direction in Activity 7?
A) Anemometer B) Maximum-minimum thermometer
C) Wind vane or arrow setup D) Barometer
Answer:A
Solution: Wind direction is determined using a wind vane (also known as a weather vane or arrow setup). This device rotates freely and points in the direction from which the wind is blowing. It's a simple yet effective tool to observe wind patterns

JEE ADVANCED LEVEL QUESTIONS

Multi correct answer type:

11. How do elderly people often make weather predictions?
A) By observing cloud formations
B) By listening to weather forecasts on TV
C) Based on their experience with different seasons
D) By using modern weather instruments
Answer:A,C
Solution:Elderly people often rely on natural signs and lifetime experience to predict the weather. They may notice patterns in clouds, wind, temperature, or animal behavior.
12. What are the impacts of weather on daily life?
A) Influencing clothing choices
B) Affecting agricultural activities

C) Determining school schedules
D) Shaping travel plans
Answer:A,B,C,D
Solution:Weather influences many parts of daily life, from what we wear to whether schools are closed or crops can be grown, and even whether travel is safe.
13. Which factors influence the climate of a place? (Select all that apply)
A) Temperature B) Rainfall patterns C) Wind speed D) Geological features
Answer:A,B,D
Solution:
Temperature affects the overall warmth or coolness of a region and helps define climate zones like tropical, temperate, or polar.
Rainfall patterns determine how wet or dry a place is, influencing vegetation, agriculture, and even wildlife.
Geological features, like mountains, valleys, or proximity to oceans, can impact wind flow, moisture levels, and temperature distribution. For example, mountains can block rainfall, creating dry regions called rain shadows.
C) Wind speed, while important in day-to-day weather, doesn't significantly shape long-term climate patterns the way the others do.

Assertion and Reason Type:

A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.
B) Both Assertion and Reason are true, but Reason is NOT the correct explanation for Assertion.
C) Assertion is true, but Reason is false.
D) Assertion is false, but Reason is true.
14. Reason : Temperature, humidity, rainfall, and wind speed changes affect human beings and other living organisms.
Assertion : Weather changes, including fluctuations in temperature, humidity, rainfall, and wind speed, have significant impacts on human health, agriculture, ecosystems, and infrastructure, highlighting the importance of understanding and monitoring weather patterns.
Answer:A
Solution:Assertion correctly states that weather changes impact multiple sectors (health, agriculture, etc.).
Reason accurately explains why these impacts occur (because these weather variables directly affect living organisms and systems).
The Reason provides the scientific basis for the Assertion's claim about weather's importance.
15. Reason : Weather forecasts provide information about future weather conditions.
Assertion : Weather forecasts, like the one mentioning isolated rain or thunderstorms in certain districts, offer predictions about upcoming weather events, helping individuals and organizations prepare for potential impacts and make informed decisions to

mitigate risks.
Answer:A
Solution:Assertion describes the purpose of weather forecasts (to prepare for risks).
Reason states the function of forecasts (predicting future weather).
The Reason directly explains how forecasts fulfill the Assertion's claim (by providing future weather data).
16. Reason : Weather reports detail past weather conditions, including temperature measurements and rainfall recordings.
Assertion : Weather reports, such as the one mentioning specific maximum and minimum temperatures recorded in different districts, provide historical data on weather conditions, allowing for analysis of trends and patterns over time.
Answer:A
Solution:Assertion highlights the utility of weather reports (trend analysis).
Reason describes the content of reports (past weather data).
The Reason explains why reports enable trend analysis (by documenting historical conditions).

Matrix Matching Type:

17. Column A
1. Using a Maximum-Minimum Thermometer (MMT)
2. Measuring Rainfall with Simple Tools
3. Finding Wind Direction
4. Understanding Evaporation
Column B
A. Measures rainfall using basic tools like a beaker and funnel.
B. Demonstrates the process of water changing into vapor due to heating.
C. Measures the highest and lowest temperatures of a place.
D. Determines wind direction using homemade instruments.
Answer:1-C,2-A,3-D,4-B
Solution:
1. Using a Maximum-Minimum Thermometer (MMT)----C. Measures the highest and lowest temperatures of a place.
2. Measuring Rainfall with Simple Tools--------A. Measures rainfall using basic tools like a beaker and funnel.
3. Finding Wind Direction------D. Determines wind direction using homemade instruments.
4. Understanding Evaporation------B. Demonstrates the process of water changing into vapor due to heating.

Comprehension Type:

Weather is a dynamic and ever-changing phenomenon, exhibiting variability even within a single day. While most of the day may follow a predictable pattern, unexpected changes can occur rapidly, illustrating the complexity of atmospheric conditions. For instance, a morning may begin with clear skies and sunshine, only to be interrupted by the sudden appearance of clouds

followed by rainfall. However, this precipitation may be short-lived, giving way to bright sunshine once again within a matter of minutes. These rapid fluctuations in weather highlight the intricate and unpredictable nature of atmospheric processes.

18. What does the passage primarily discuss?

A) Daily weather patterns
B) Long-term climate trends
C) Predictable atmospheric phenomena
D) Historical weather data

Answer:A

Solution:The passage focuses on how weather can change rapidly within a single day, describing examples of short-term fluctuations, not long-term climate trends.

19. What example is provided to illustrate weather variability within a day?

A) Predicting long-term climate changes
B) Analyzing historical weather data
C) Observing rapid changes from sunshine to rain
D) Measuring temperature fluctuations over time

Answer:C

Solution:The passage clearly describes a scenario where clear skies shift to rain and then back to sunshine, showing weather's rapid changes.

20. What is emphasized about the nature of weather in the passage?

A) Its simplicity and predictability
B) Its complexity and unpredictability
C) Its consistency and uniformity
D) Its variability and inconsistency

Answer:B

Solution:Words like "complexity," "unpredictable," and "intricate" directly highlight that the passage emphasizes how weather is not simple or predictable.

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS

1. How do elderly people often predict weather conditions?

A) By watching TV forecasts B) By observing seasonal changes
C) By consulting meteorological reports
D) By using advanced weather prediction tools

Answer:B

Solution:Elderly people traditionally rely on natural signs, seasonal changes, and experience-based patterns rather than scientific tools or forecasts.

2. What source do farmers rely on for weather forecasts?

A) Television B) Newspaper
C) Radio or TV weather forecasts D) Traditional weather signs

Answer:C

Solution:While some farmers still use traditional signs, many now commonly rely on radio or TV for daily weather updates that guide agricultural decisions.

3. Where do weather predictions primarily come from?
A) Elders' observations B) Meteorological departments
C) Weather apps D) Superstitions
Answer:B
Solution:Weather predictions are primarily made by meteorological departments using satellite data, computer models, and atmospheric observations.
4. What instruments are commonly used to measure weather components?
A) Thermometers, barometers, and rain gauges B) Cameras and telescopes
C) Microscopes and spectrometers D) Binoculars and anemometers
Answer:A
Solution: Instruments measure temperature (thermometer), air pressure (barometer), and rainfall (rain gauge)
5. What does a maximum-minimum thermometer measure?
A) Wind speed B) Rainfall intensity
C) Highest and lowest temperatures D) Humidity levels
Answer:C
Solution:This thermometer records the maximum (hottest) and minimum (coldest) temperatures over a period (usually 24 hours).

JEE MAINS LEVEL QUESTIONS

6. What method do farmers traditionally use to estimate rainfall?
A) Rain gauge B) Meteorological reports
C) Soil wetness observation D) PADUNU
Answer:C
Solution:Traditional farmers often estimate rainfall by checking the wetness of the soil, looking at how deep water has seeped, and other natural signs.
7. What is the purpose of using a rain gauge?
A) To estimate temperature changes
B) To measure wind direction
C) To collect rainwater for drinking
D) To measure the exact amount of rainfall
Answer:D
Solution:A rain gauge is a scientific instrument used to accurately measure how much rain has fallen over a period of time.
8. How do farmers celebrate the first showers in rural areas?
A) By organizing crop festivals B) By conducting weather experiments
C) By offering prayers to rain gods D) By going on a holiday
Answer:C
Solution:In many rural areas, the arrival of the first rains after a dry season is seen as a blessing and a sign that the upcoming harvest will be plentiful. Farmers often celebrate this event by performing religious rituals and offering prayers to the rain gods, asking for continued blessings throughout the growing season.
9. What is used to determine wind direction in Activity 7?
A) Anemometer B) Maximum-minimum thermometer
C) Wind vane or arrow setup D) Barometer
Answer:C
Solution:Wind vanes (or arrow setups) are simple tools used to determine from

which direction the wind is blowing.
10. What is humidity?
A) The speed of wind B) The amount of rainfall
C) The moisture content in the air D) The temperature of the air
Answer:C
Solution:Humidity refers to the amount of water vapor present in the air, which affects comfort, rainfall, and weather patterns.

JEE ADVANCED LEVEL QUESTIONS

Multi correct answer type:

11. How can humidity levels be determined?
A) Observing the presence of bubbles in water
B) Measuring the evaporation rate of water
C) Using a hygrometer
D) Analyzing weather reports from meteorological departments
Answer:B,C
Solution:Measuring the evaporation rate of water:
Since higher humidity slows down evaporation, the rate of evaporation can indirectly indicate the level of moisture in the air.
Using a hygrometer:
A hygrometer is a dedicated instrument designed to directly measure humidity by detecting the amount of water vapor present in the air.
12. Which instruments can measure wind speed and direction?
A) Anemometer B) Wind vane C) Maximum-minimum thermometer D) Windsock
Answer:A,B,D
Solution:A) Anemometer – measures wind speed
B) Wind vane – shows wind direction
D) Windsock – shows both direction and approximate speed
13. What are the components of weather measurements?
A) Temperature B) Rainfall C) Wind speed D) Soil fertility
Answer:A,B,C
Solution:Core weather components include:
A) Temperature (measured by thermometers).
B) Rainfall (measured by rain gauges).
C) Wind speed/direction (measured by anemometers/wind vanes).

Assertion and Reason Type:

A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.
B) Both Assertion and Reason are true, but Reason is NOT the correct explanation for Assertion.
C) Assertion is true, but Reason is false.
D) Assertion is false, but Reason is true.
14. Reason : Elderly people often rely on their observations of different seasons to make weather predictions.
Assertion : Elderly wisdom and weather observation go hand in hand, as older generations have accumulated knowledge about weather patterns over time, enabling them to make accurate predictions

for family functions and daily activities.

Answer:A

Solution:Assertion states that elderly people use accumulated knowledge for weather predictions.
Reason explains how they do this (through seasonal observations).
The Reason directly supports the Assertion by detailing the method behind elderly weather wisdom.

15. Reason : Farmers depend on weather forecasts to plan their agricultural activities.
Assertion : Weather forecasts provided by meteorological departments help farmers make informed decisions about when to plant, irrigate, or harvest crops, ultimately impacting agricultural productivity and crop yields.

Answer:A

Solution:Assertion describes the impact of weather forecasts on farming decisions.
Reason explains the dependency of farmers on these forecasts.
The Reason logically justifies the Assertion's claim about forecast utility.

16. Reason : Weather predictions are derived from data collected and analyzed by meteorological departments.
Assertion : Meteorological departments collect data on various weather parameters, such as temperature, humidity, and rainfall, and use sophisticated analysis techniques to make accurate weather predictions, which are crucial for planning daily activities and ensuring public safety.

Answer:A

Solution:Assertion explains the process and importance of meteorological predictions.
Reason summarizes the source of predictions (data analysis).
The Reason provides the foundational basis for the Assertion's detailed claims.

Matrix Matching Type

17. Match the climate feature with the appropriate state.

Column	A Column B
1. Hot and dry climate	A. West Bengal
2. Rainy climate	B. Jammu & Kashmir
3. Humid climate	C. Kerala
4. Cold climate	D. Rajasthan

Answer:1 – D, 2 – C, 3 – A, 4 – B

Solution:

Matrix Matching Type

17. Match the climate feature with the appropriate state.

Column	A Column B
1. Hot and dry climate	D. Rajasthanl
2. Rainy climate	C. Kerala
3. Humid climate	A. West Benga
4. Cold climate	B. Jammu & Kashmir

Comprehension Type

The recent meteorological department report provides valuable insights into past weather conditions across Telangana and Andhra Pradesh. Notably, Ramagundam, located in the Peddapally district, experienced scorching temperatures, with the mercury soaring to a maximum of 42°C. Meanwhile, Aarogyavaram in the Chittoor district recorded relatively cooler temperatures, with a minimum of 29°C. In Hyderabad, the presence of cumulonimbus clouds led to a brief spell of rainfall, measuring 2mm. Additionally, scattered rainfall was observed in certain parts of interior Rayalaseema, while the rest of Telangana and Andhra Pradesh remained dry. This comprehensive report offers valuable data for analyzing past weather patterns and understanding regional climatic variations.

18. What was the maximum temperature recorded in Ramagundam, as per the meteorological department report?

A) 29°C B) 42°C C) 2mm D) 35°C

Answer:B

Solution:Ramagundam, located in the Peddapally district, experienced scorching temperatures, with the mercury soaring to a maximum of 42°C.

19. What weather phenomenon led to rainfall in Hyderabad, according to the report?

A) Cumulonimbus clouds B) Scattered rainfall C) Dry conditions D) Coastal winds

Answer:A

Solution:In Hyderabad, the presence of cumulonimbus clouds
led to a brief spell of rainfall, measuring 2mm.

20. Where was scattered rainfall recorded, according to the meteorological report?

A) Hyderabad B) Telangana C) Andhra Pradesh D) Interior Rayalaseema

Answer:D

Solution:Scattered rainfall was observed in certain parts of interior Rayalaseema.

KEY

				TEACHING TASK					
1	2	3	4	5	6	7	8	9	10
A	B	C	C	B	D	D	B	C	A
11	12	13	14	15	16	17		18	19
A,C	A,B,C,D	A,B,D	A	A	A	1-C,2-A,3-D,4-B		A	C
20									
B									
				LEARNERS TASK					
1	2	3	4	5	6	7	8	9	10
B	C	B	A	C	C	D	C	C	C
11	12	13	14	15	16	17			
B,C	A,B,D	A,B,C	A	A	A	1 – D, 2 – C, 3 – A, 4 – B			
18	19	20							
B	A	D							