



CHAPTER-7
WEATHER, CLIMATE AND ADAPTATIONS
OF ANIMALS TO CLIMATE

SOLUTIONS:

Exercises

1. Name the elements that determine the weather of a place.

Ans: The elements that determine the weather of a place are temperature, humidity, rainfall, wind speed, air pressure etc.

2. When are the maximum and minimum temperatures likely to occur during the day?

Ans: The maximum temperature of the day occurs generally in the afternoon while the minimum temperature occurs generally in the early morning.

3. Fill in the blanks:

- i) The average weather taken over a long time is called **climate**.
- ii) A place receives very little rainfall and the temperature is high throughout the year, the climate of that place will be **hot** and **dry**.
- iii) The two regions of the earth with extreme climatic conditions are **the polar regions** and **the tropical regions**.

4. Indicate the type of climate of the following areas:

- a) Jammu and Kashmir: **moderately hot and wet climate**
- b) Kerala: **hot and wet climate**
- c) Rajasthan: **hot and dry climate**
- d) North-east India: **wet climate**

5. Which of the two changes frequently, weather or climate?

Ans: Weather changes frequently but not climate.

6. Following are some of the characteristics of animals:

- i) Diets heavy on fruits.
- ii) White fur
- iii) Need to migrate
- iv) Loud voice
- v) Sticky pads on feet
- vi) Layer of fat under skin
- vii) Wide and large paws

- viii) **Bright colours**
- ix) **Strong tails**
- x) **Long and large beak**

For each characteristic indicate whether it is adaptation for tropical rain forests or polar regions. Do you think that some of these characteristics can be adapted for both regions?

Ans:

| Characteristics of Animals | Adaptation for Tropical rain forests or Polar regions |
|-----------------------------|---|
| i) Diets heavy on fruits. | Tropical rain forests |
| ii) White fur | Polar regions |
| iii) Need to migrate | Polar regions |
| iv) Loud voice | Tropical rain forests |
| v) Sticky pads on feet | Polar regions |
| vi) Layer of fat under skin | Polar regions |
| vii) Wide and large paws | Tropical rain forests |
| viii) Bright colours | Tropical rain forests |
| ix) Strong tails | Tropical rain forests |
| x) Long and large beak | Tropical rain forests |

No, these characteristics cannot be adapted for both regions.

7. The tropical rain forest has a large population of animals. Explain why it is so.

Ans: The tropical rain forest has a large population of animals because of continuous warmth and rain throughout the year. This means that the climate conditions in this region are highly suitable for reporting an enormous number and a variety of animals.

8. Explain, with examples, why we find animals of certain kind living in particular climatic conditions.

Ans: We find animals of certain kind living in particular climatic conditions because every living organism is adapted to live in the particular habitat. Every living thing develops their feature according to the area they live in.

Climate has a profound effect on all living organisms. Animals are adapted to survive in the conditions in which they live. Animals living in very cold and hot climate must possess special features to protect themselves against the extreme, cold or heat.

For example, Penguins have thick skin to protect themselves from cold and webbed feet to swim in water. It will not be able to survive in the hot climate of tropical regions as they developed thick skin for the protection of cold not from the hot and humid temperature.

9. How do elephant living in the tropical rain forests adapt itself?

Ans: The elephant has adapted to the climate conditions of the tropical rain forests in many remarkable ways:

- i) It has a trunk that it uses as a nose because of which it has a strong sense of smell.
- ii) The trunk is also used by it for picking up food.
- iii) Its tusks are modified teeth. These can tear the bark of trees that an elephant loves to eat. So, the elephant is able to handle the competition for food very well.
- iv) Large ears of the elephant help it to hear even very soft sounds.
- v) The ears also help the elephant to keep cool in the hot humid climate of the rain forest.

Choose the correct option which answers the following question.

10. A carnivore with stripes on its body moves very fast while catching its prey. It is likely to be found in

- i) polar regions
- ii) deserts
- iii) oceans
- iv) tropical rain forests

Ans: tropical rain forests

11. Which features adapt polar bears to live in extremely cold climate?

- i) A white fur, fat below skin, keen sense of smell
- ii) Thin skin, large eyes, a white fur
- iii) A long tail, strong claws, white large paws.
- iv) White body, paws for swimming, gills for respiration.

Ans: A white fur, fat below skin, keen sense of smell

12. Which option best describes a tropical region?

- i) Hot and humid
- ii) Moderate temperature, heavy rainfall
- iii) Cold and humid
- iv) Hot and dry

Ans: hot and humid

Extended Learning- Projects and Activities

1. Collect weather reports of seven successive days in the winter months (preferably December). Collect similar reports for the summer months (preferably June). Now prepare a table for sunrise and sunset times as shown:

Table

| June | | | December | | |
|------|---------|--------|----------|---------|--------|
| Date | Sunrise | Sunset | Date | Sunrise | Sunset |
| | | | | | |

Try to answer the following questions:

- i) Is there any difference in the time of sunrise during summer and winter?
- ii) When do you find that the sun rises earlier?
- iii) Do you also find any difference in the time of sunset during the month of June and December?
- iv) When are the days longer?
- v) When are the nights longer?
- vi) Why are the days sometimes longer and sometimes shorter?
- vii) Plot the length of the day against the days chosen in June and December.

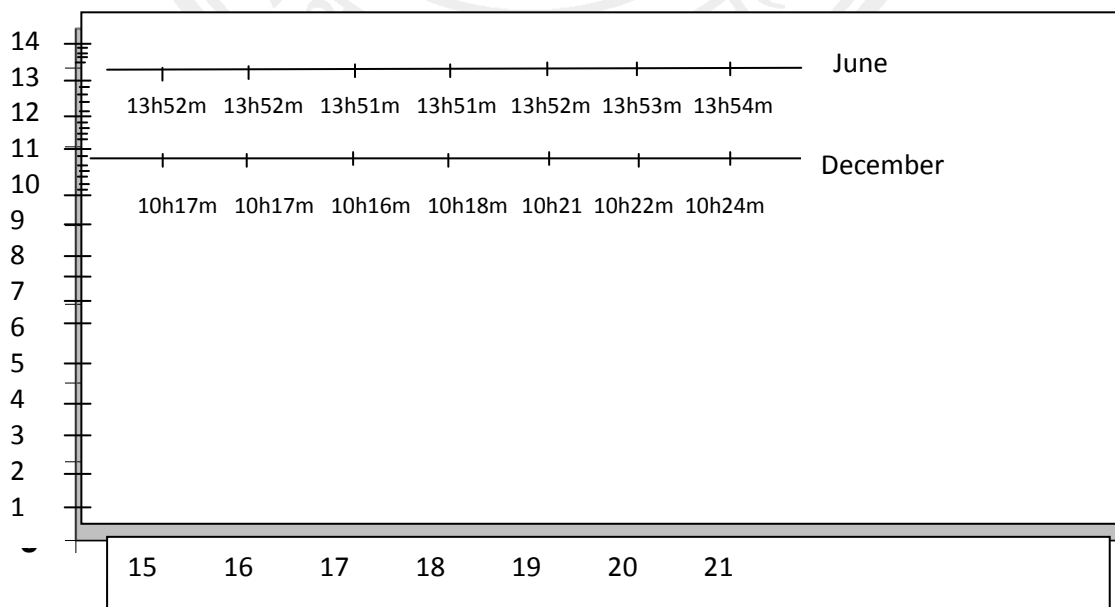
(Instructions for plotting graphs are given in Chapter 13.)



Ans:

| June | | | December | | |
|------------|---------|----------|------------|----------|----------|
| Date | Sunrise | Sunset | Date | Sunrise | Sunset |
| 15-06-2019 | 4:24 AM | 18.04 PM | 15-12-2019 | 5:50 AM | 16:27 PM |
| 16-06-2019 | 4:24 AM | 18.04 PM | 16-12-2019 | 5:51 AM | 16:27 PM |
| 17-06-2019 | 4:24 AM | 18.05 PM | 17-12-2019 | 05:51 AM | 16:28 PM |
| 18-06-2019 | 4:25 AM | 18.05 PM | 18-12-2019 | 05:52 AM | 16:28 PM |
| 19-06-2019 | 4:25 AM | 18.05 PM | 19-12-2019 | 05:52 AM | 16:29 PM |
| 20-06-2019 | 4:25 AM | 18.06 PM | 20-12-2019 | 05:53 AM | 16:29 PM |
| 21-06-2019 | 4:25 AM | 18.06 PM | 21-12-2019 | 05:54 AM | 16:30 PM |

- i) Yes.
- ii) Sun rises earlier during summer.
- iii) Yes. Sun sets earlier during winter.
- iv) During summer, the days are longer.
- v) During winter, the nights are longer.
- vi) Earth revolves around the sun. During different times, the angle of earth with the sun changes. This cause the difference in length of day and night.
- vii)



DATES

2. Collect information about the Indian Meteorological Department. If possible visit its website: <http://www.imd.gov.in>

Write a brief report about the things this department does.

Ans: India Meteorological Department was established in 1875. It is the National Meteorological Service of the country and the principal government agency in all matters relating to meteorology, seismology and allied subjects.

- To take meteorological observations and to provide current and forecast meteorological information for optimum operation of weather-sensitive activities like agriculture, irrigation, shipping, aviation, offshore oil explorations, etc.
- To warn against severe weather phenomena like tropical cyclones, norwesters, dust storms, heavy rains and snow, cold and heat waves, etc., which cause destruction of life and property.
- To provide meteorological statistics required for agriculture, water resource management, industries, oil exploration and other nation-building activities.
- To conduct and promote research in meteorology and allied disciplines.
- To detect and locate earthquakes and to evaluate seismicity in different parts of the country for development projects.



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EXTRA QUESTIONS AND ANSWER

1. What do you mean by weather?

Ans: The day-to-day condition of the atmosphere at a place with respect to the temperature, humidity, rainfall, wind speed etc. is called the weather of a place.

2. What are the factors which help to predicts weather of a day?

Ans: Temperature, humidity and rainfall.

3. Who prepares the weather report?

Ans: The Meteorological Department of the Government prepares the weather report.

4. Name the instrument which is used to measure rainfall.

Ans: Rain gauge

5. Name the thermometer used to record maximum and minimum temperature of a day.

Ans: Maximum and minimum thermometer

6. What is the maximum and minimum thermometer? When do you measure the maximum and minimum temperature of a day?

Ans: The special thermometers which are used to measure the maximum and minimum temperature of a day is called the maximum and minimum thermometer.

The maximum temperature of a day is measured generally in the afternoon and the minimum temperature of a day is measured generally in the early morning.

7. What is the main cause of the changes in the weather?

Ans: The sun is the main cause of the changes in the weather.

8. What do you mean by climate?

Ans: The average weather pattern taken over along time, say 25 years, is called the climate of the place.

9. What plays an important role in determining the weather at any place?

Ans: The sun is the primary source of energy that causes changes in the earth's surface oceans and the atmosphere plays an important role in determining the weather at any place.

10. Differentiate between weather and climate?

Ans:

| Weather | Climate |
|--|--|
| i) It is the day-to-day conditions of the atmosphere of a place. | i) It is the average weather pattern taken over a long time. |
| ii) It can vary over very short period of time. | ii) It does not vary over short period of time but vary after about 25-30 years. |
| iii) It cannot affect the adaptation of organisms. | iii) It affects the adaptation of an organism. |

11. How is the mean temperature of the climatic conditions of two places for a month?

Ans: The mean temperature of the climatic conditions of two places for a month is calculated in two steps: First of all we find the average of the temperatures recorded during the month. Secondly, we calculate the average of such average temperatures over many years.

12. How does the climate Jammu & Kashmir different from that of Kerala?

Ans: The climate of Kerala is very hot and wet in comparison to Jammu & Kashmir where climate is moderately hot and wet for most of the year.

13. Describe the climate of the western region of India like Rajasthan?

Ans: In the western region of India like Rajasthan the climate is said to be hot and dry. Here, the temperature is high during most part of the year. But during winter, the temperature is quite low and lasts only for a few months. This is the typical desert climate.

14. What do you mean by the term adaptation?

Ans: The modifications of the features and the functions of the body according to the climatic condition are called adaptations.

15. Name two regions which have severe climatic condition with examples.

Ans: The two regions which have severe climatic conditions are:

- i) Polar regions e.g. Canada, Greenland, Iceland, Norway, Sweden, Finland, Alaska and Siberian regions of Russia
- ii) the Tropical regions e.g. India, Malaysia, Indonesia, Brazil, Republic of Congo, Kenya, Uganda and Nigeria

16. Describe the climate of the Polar Regions?

Ans: The Polar Regions has an extreme climate. These regions are covered with snow and it is very cold for most parts of the year. For six months, the sun does not set at the poles while for other six months the sun does not rise. In winters, the temperature can be as low as -37°C .

17. Why do polar have a white fur?

Ans: Polar bears have white fur so that they are not easily visible in the snowy background. It protects them from their predators and helps them in catching their prey.

18. Explain the features which make the polar bear adapt to the extreme climate of the Polar Regions?

Ans: Some of the adaptive features of the polar bear with the climate of the Polar Regions can be explained as follows:

Polar bears have white fur so that they are not easily visible in the snowy white background. The fur protects them from their predators. It also helps them in catching their prey. They have two thick layers of fur to protect them from extreme cold. They are so well insulated that they have to move slowly and rest often to avoid getting over heated.

The polar bears go for swimming for cooling on warm days when they do physical activities. Its paws are wide and large, which help it not only to swim well but also walk with ease in the snow. While swimming under water, it can close its nostril and can remain under water for long duration. It has a strong sense of smell so that it can catch its prey for food.

19. Explain the adaptive features of Penguin to live in the polar region? Why do the Penguins huddle together?

Ans: The adaptive features of the Penguin to live in the polar region can be explained as given below:

Penguins have white fur which merges well with the snowy white background making them not easily visible. It also has a thick skin and a lot of fat to protect it from cold. The Penguins huddled together to keep each other warm. They are also a great swimmer just like the polar bear. Their bodies are streamlined and their feet have webs, making them good swimmers.

The Penguins huddled together to keep themselves warm.

20. What are migratory birds?

Ans: Some species of birds which lives in the polar region migrates to warmer regions when winter sets in and come back to their native place after the winter is over. Such birds are called migratory birds.

21. What is the climate of the tropical regions?

Ans: The tropical regions generally have a hot climate because of its location around the equator. Even in the coldest month the temperature is generally higher than about 15°C. During summer the temperature may cross 40°C. These regions get plenty of rainfall.

22. What is the important feature of the tropical region?

Ans: The important feature of the tropical regions is the tropical rain forests.

23. Give some examples of some animals of the tropical regions with their special adaptive features in order to get food.

Ans: Some examples are:

- i) Red eyed frog has developed sticky pads on its feet to help it climb on trees on which it lives.
- ii) Monkeys have long tails for growing branches of trees. Their hands and feet are such that they can easily hold on to the branches.
- iii) The bird Toucan possesses a long, large beak which helps to reach the fruits on branches which are otherwise too weak to support its weight.
- iv) The lion-tailed Macaque is a good climber and spends a major part of its on trees. It feeds mainly on fruits along with seeds, young leaves, stems, flowers and buds. It also searches for insects under the bark of the trees. Since it is able to get sufficient food on the trees, it rarely comes down on the ground.

24. What adaptive features are there in some tropical animals to protect them from predators? Give examples.

Ans: In-order to protect them from predators, many tropical animals have sensitive hearing, sharp eye sight, thick skin and a skin colour which helps them to camouflage by blending with the surroundings.

For e.g. big cats like lions and tigers have thick skin and sensitive hearing.

25. Collect the weather data of a week from a newspaper and tabulate it in a table.

Ans: Cut out the weather reports of the last week from any newspaper. Paste all the cut outs on a white sheet or on a chart paper. Now record the information from the weather reports collected.

| Date | Max. temp. (°C) | Min. temp. (°C) | Min. humidity (%) | Max. humidity (%) |
|----------|-----------------|-----------------|-------------------|-------------------|
| 25-05-20 | 29 | 22 | 51 | 71 |
| 26-05-20 | 31 | 21 | 54 | 86 |
| 27-05-20 | 30 | 21 | 58 | 100 |
| 28-05-20 | 32 | 21 | 52 | 86 |
| 29-05-20 | 33 | 23 | 49 | 72 |
| 30-05-20 | 33 | 22 | 54 | 93 |
| 31-05-20 | 32 | 23 | 55 | 85 |

26. Draw or take an outline map of the world and mark the Polar Regions in blue and the tropical regions in dark brown.

Ans:

