# PRACTICALS

# CONTENTS

# Practical No. 1 - Interpolation

**Aim :** Construction of isolines on a map

**Objectives :**

1) To understand the purpose of using isolines in maps
2) To interpret isopleth maps for different variables.
3) To understand the method of drawing isolines on a map with the help of given data

**Introduction :**

Isolines are lines drawn on a map to link different places that share a common value. The prefix 'iso' is a Greek word meaning equal; so an isoline is a line joining points showing equal values. For example, a line drawn on a map to join up all the places that have the same height above sea level is called a contour. There are many examples of isolines used in maps. Isotherms are used to show temperatures, isobars for atmospheric pressure, etc. Values of the variable are not available for all the places in a given area. In such a situation,using collected and available information, the values for intermediate locations are estimated on the basis of those for which the values are available. For this , technique of interpolation is used. Once the values for intermediate locations become available ,one has to look for points of equal values and such points are joined by a line to draw isolines. The technique of interpolation is used for drawing the lines. Interpolation is used to insert the intermediate values between the observed values of two stations.

**Materials required :**

Tracing paper, pencil, rubber, scale, marker pen 0.5, Base map showing locations of different points, with values for the given variable.

**Procedure :**

**STEP 1 -** You will be given a set of data which contains values of temperatures, heights, pressure, etc. In this example, we are giving a set of data for temperatures in degree Celsius. See fig 1.1.

Study the given data. Note the minimum value and the maximum value. Here, 2° C is the lowest value and 32° C is the highest value. Decide the interval of drawing the isolines. Here, you can take the interval of 5° C. This implies that the value of minimum isotherm will be 5° C while that of maximum will be 30° C. Therefore, we need to draw isotherms of 5°, 10°, 15° , 20° , 25° and 30° C.


**Fig. 1.1**

**STEP 2 -** Now observe the data. See where you can see points having. 5° C. Some values are 5° C given directly but at other locations, you will not find value of 5° C. These will have to be found on the basis of available other values. For example, 5 can lie between 2 and 10 or 4 and 7, 4 and 8 etc. You have to locate value of 5° C in between all these points. Select any two points out of these. Suppose you take between A - 10° and B - 2° C. To fix the location of the 5° C isotherm between these two points, draw a straight line between them. Divide this line into 8 (10 - 2 = 8) equal

parts using a scale. The divisions could be rounded off to make the division easier. Mark the 5° C point of the isotherm by counting it from either 2° or 10°. Thus, one 5° C isotherm point is fixed. Repeat this process till you get all the possible 5° points. See fig 1.2.

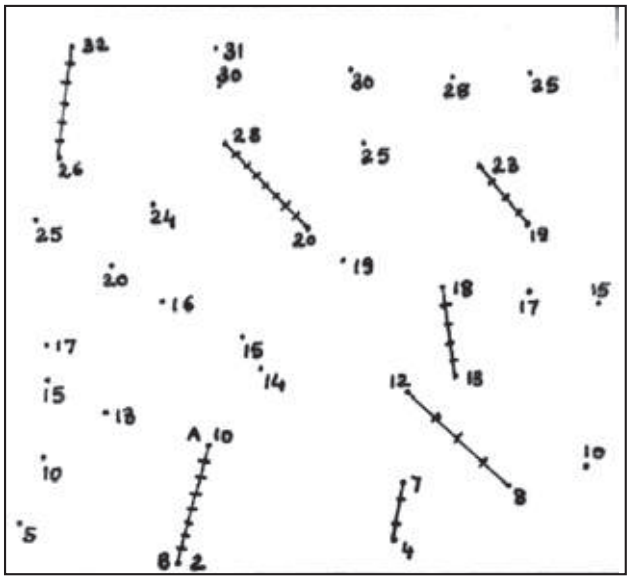



Fig. 1.2

**STEP 3 -** Join all the points of 5° C. Make sure it is a smooth line. Do not use scale to join the points. Mark 5° C near the margins. After 5° C isotherm, take 10° C isotherm. Some points of 10° are already given. Find the others using two points. Similarly, take 2 points in such a way that 10° C isotherm point will lie between them.

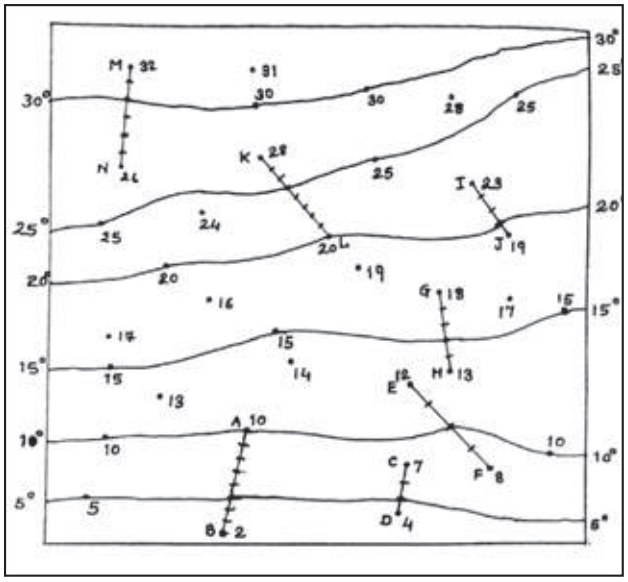



Fig. 1.3

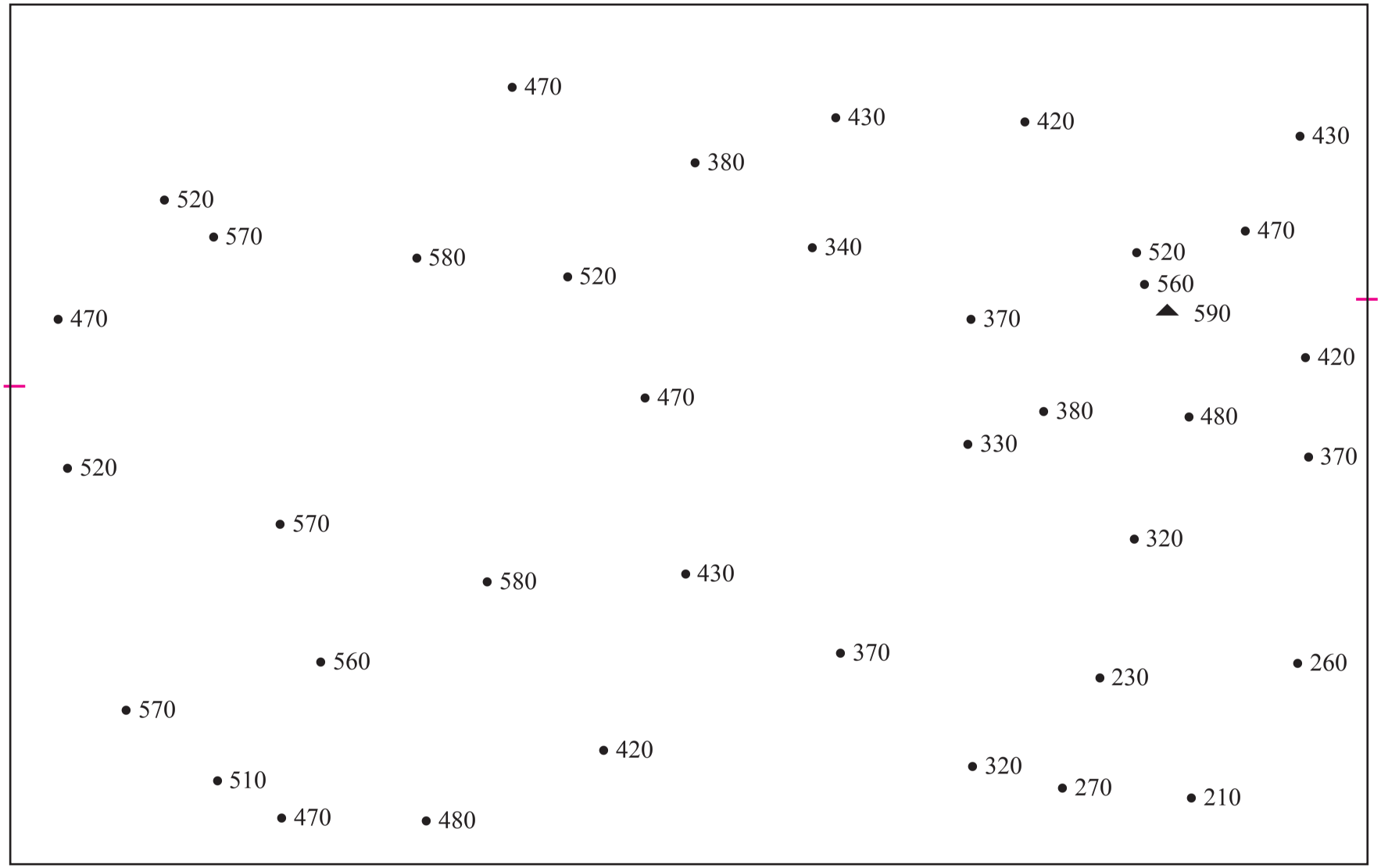
Join the two points and divide them into equal parts according to the difference between them (Higher value - lower value). Repeat this procedure till you get points for all isotherms till 30° C. (maximum value of the data).

**STEP 4 -** After you get all the points of isotherm, join the points of equal values from one edge to the other. Make sure your lines are smooth and continuous. Do not use a scale to join the points. Write the respective values at the margins. See fig 1.3.

### Observation and learnings:

Write a note on your observations and interpretation of the isotherms after your map is complete. Comment on the nature of isolines you have drawn. Think of more parameters which you can show using isolines. Discuss the advantages and disadvantages of the interpolation method in the class.

**Practice more :** Draw the isolines for the data given in figure 1.4. The figure you obtain after interpolation will be used for practical 2.


470
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370
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430
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210
470
480

Fig. 1.4

# Practical No. 2 - Cross Profile

**Aim :** To interpret various contours showing different landforms and draw their profiles.

**Objectives :**

i) To understand the use of contours in understanding various landforms.

ii) To understand various types of slopes with the help of profiles.

iii) To draw profiles of various landforms using contours.

iv) Interpreting the relief of the area with the help of profiles.

**Introduction :**

Contour lines are used to represent a three-dimensional image on flat surfaces. They are commonly used on topographic maps. Here contour lines connect continuous points of equal elevation. They are shown in centimetres or metres. A 5m contour show that the locations are at a height of 5m.

The rate of rise or fall of a terrain feature is known as its slope. Four types of slopes are as follows :

1) Uniform slope : Equidistant contour lines on a map indicate a uniform slope.

2) Gentle slope: When the contour lines on a map are far away from one another , they indicate a gentle slope.

3) Steep slope : if the contour lines on a map are close to one another, the slope is steep

4) Concave and convex slope: On a map, if the contours with higher values are closer to one another, and those with lower values move far away from one another, it indicates a concave slope. As against this, if the contours with higher values are farther away and those with lower values are closer, they represent a convex slope.

**Profile :**

Contour maps use the contour lines to represent the third dimension of elevation. A topographic profile is a diagram that shows the change of elevation of the land surface along a given line. A topographic profile is a cross-sectional view along a line drawn through a portion of a topographic map.

**Materials required :** pencil, scale, color pencils, cross section profile from a toposheet, strip of paper

**Procedure :**

We will now learn to draw a cross profile of a part of toposheet or landscape. We need to understand the relief shown on a topographical map with the help of contours. In such a case , we draw a cross-section of the relief to understand various relief features in the area.

Following figure is given to you as example.

**STEP 1 -** Obtain the contour map you get after interpolation on Page 109 fig. 1.4. To construct a topographic profile, you must first draw a line across the profile so that the maximum area is covered. See fig. 2.1. Draw a line joining A and B.

**STEP 2 -** Place a blank piece of paper as shown in the figure, along the line you have drawn.

**STEP 3 -** On both the blank paper and the map, mark clearly the starting and ending points of your line of section. Below these marks, write down the elevation of the starting and ending points of the section.

**STEP 4 -** Make a tick mark wherever the paper crosses a contour line on the map, making larger ticks for the index contours and smaller ticks for the intermediate contours. Write the elevation of the index contours below their ticks on your paper.

**STEP 5 -** Once you are certain you have all of the appropriate tick marks and elevations, remove your paper from the map. Take a graph paper . Place your paper with the tick marks on the graph paper and mark the starting and ending

points of your line of section on the graph paper.

**STEP 6 -** Draw vertical lines above your starting and ending points. These will be the boundaries of your profile. Use the maximum and minimum elevations along your line of section to determine how long to draw these lines.

The scale is same as the scale of the toposheet from where this cross section has been taken. The scale can be taken as 1: 50000.

**STEP 7 -** Beginning with your starting elevation, go directly above the tick mark on your paper and make a small dot on the graph paper at the corresponding elevation Make a small dot for each tick mark on your paper.

**STEP 8 -** Connect the dots on the graph paper, and you have a topographic profile.

**STEP 9 -** Though you get the profile, the scale of X-axis is different from the scale of Y axis. This means the profile is vertically exaggerated . i.e. vertical scale is larger than the horizontal scale. To determine the amount of vertical exaggeration, convert both the axes in the same unit and then divide the horizontal axis by vertical axis.

**V.E = Horizontal Axis / Vertical Axis**

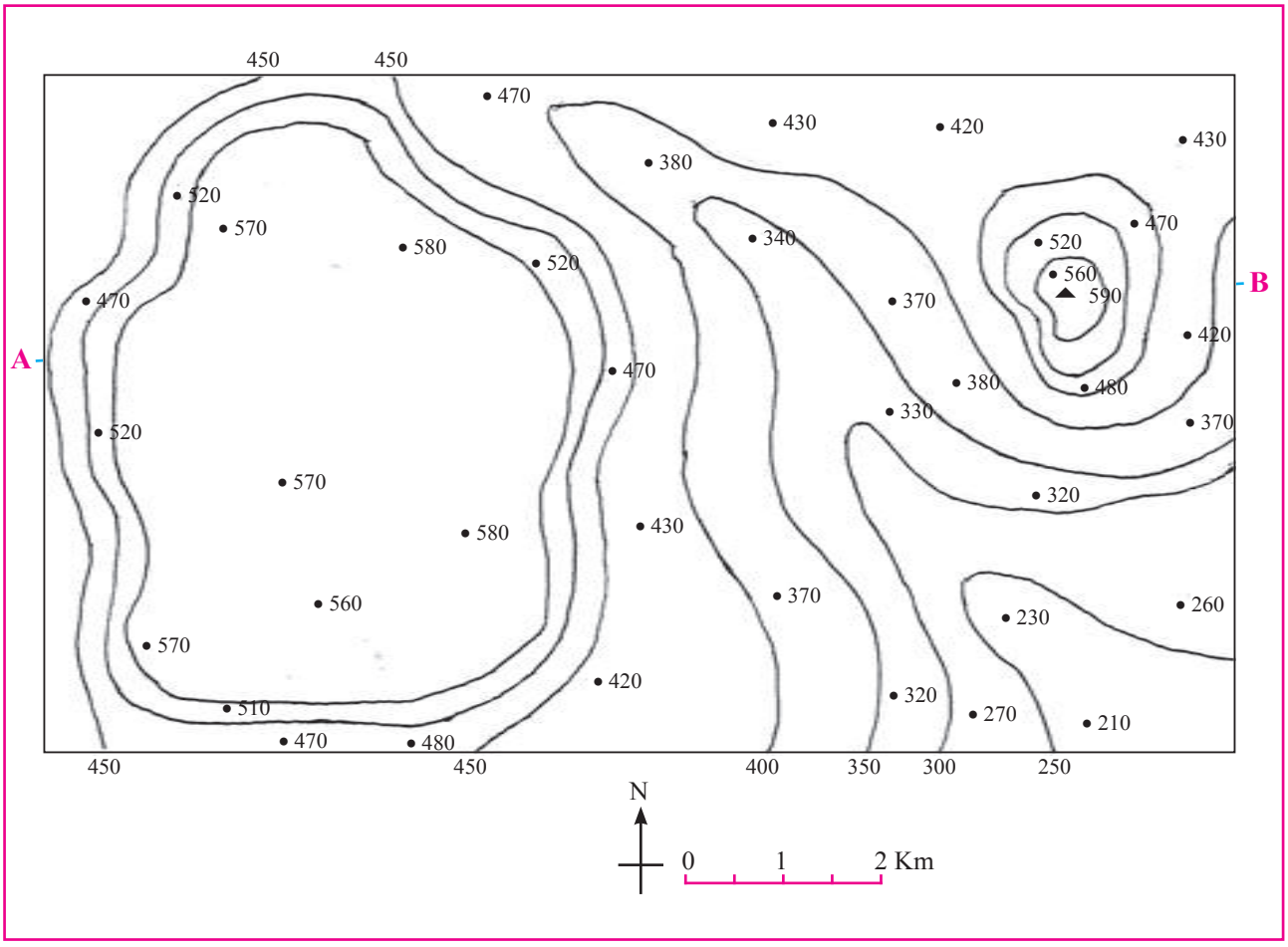


**Fig. 2.1**

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# Practical No. 3 - Toposheet-Introduction and Marginal Information

**Aim :**

1) To understand the purpose of a toposheet.
2) To extract information about the toposheet from its margins.

**Introduction :**

The topographical maps, are of utmost importance to geographers. They serve the purpose of base maps and are used to draw all the other maps. Topographical maps, also known as general purpose maps, are drawn at relatively large scales. These maps show important natural and cultural features such as relief, vegetation, water bodies, cultivated land, settlements, and transportation networks, etc. These maps are prepared and published by the Survey of India in India for the entire country. The topographical maps are drawn in the form of series of maps at different scales.

Knowledge of map language and sense of direction are essential in reading and interpreting toposheets.

**Materials required :** Any toposheet preferably 1: 50000 scale. Teachers can download the toposheets of respective districts from https://soinakshe.uk.gov.in/ and print them for use in the class.

**Procedure :**

1) You must first look for the north line and the scale of the map and orient yourself accordingly.
2) Look for the scale of the map. See where the scale is written on the map.
3) Once you know the north direction and the scale of the map, find its latitudinal and longitudinal extent.
4) Now look at the margins of the toposheet. You will find lots of information above and below the frame of the map. This information is necessary for gathering the basic knowledge of the toposheet. It includes the topographical sheet number, its location, grid references, its extent in degrees and minutes, scale, the districts covered, etc.
5) Study the given fig. 3.1, match the respective numbers with corresponding places on the toposheet in your hand and then write your observations in the table below.

| Sr. No. | Name of the information | Purpose | Example |
|---|---|---|---|
| I | | | |
| II | | | |
| III | | | |
| IV | | | |
| V | | | |
| VI | | | |
| VII | | | |
| VIII | | | |
| IX | | | |
| X | | | |
| XI | | | |
| XII | | | |
| XIII | | | |
| XIV | | | |

You must have noticed that at number 5 is the index number of a toposheet. This is related to number 11 where the scale of the toposheet is given. This is known as the indexing of the toposheet. We can identify the scale of a toposheet by its index number.

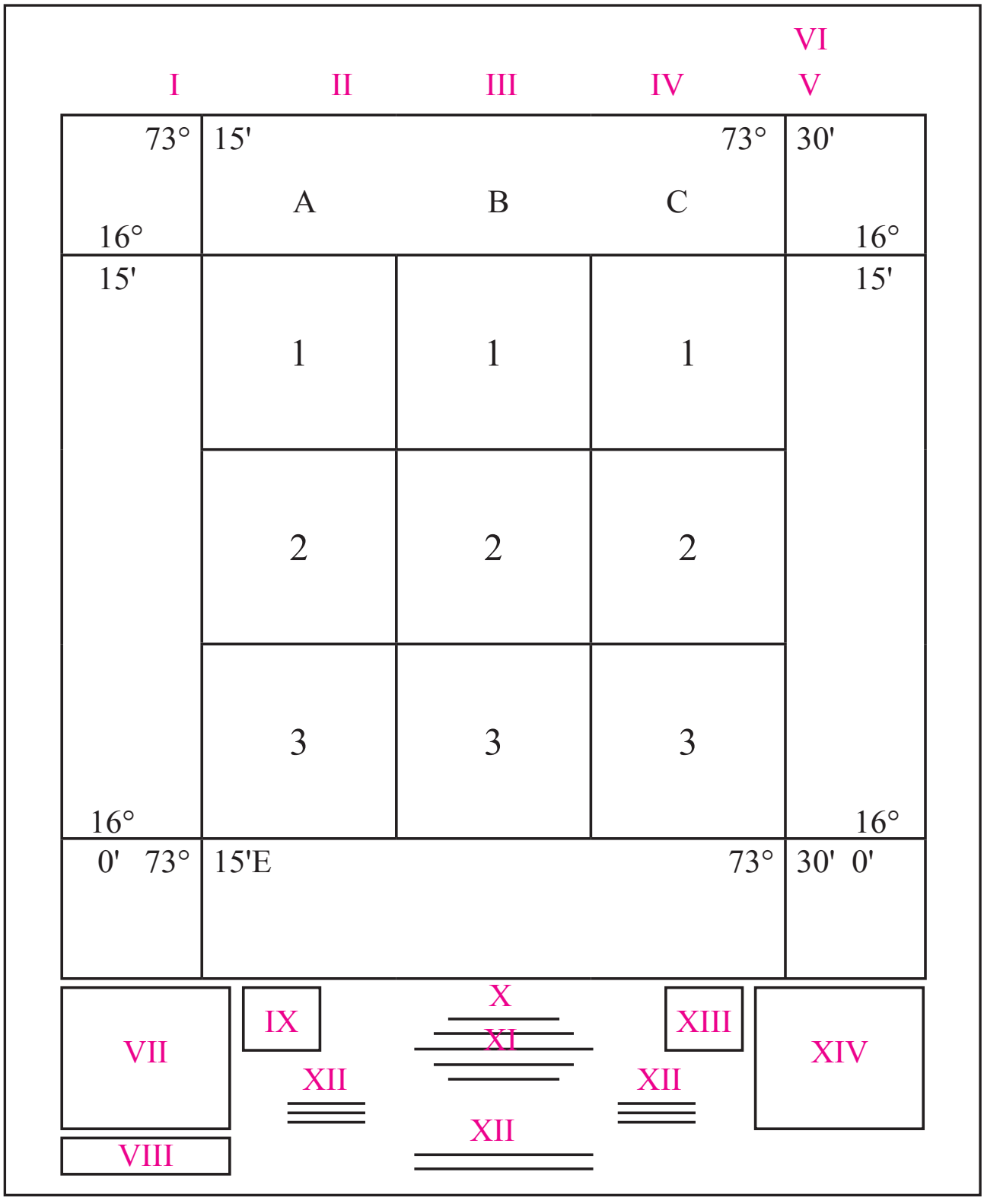


**Fig. 3.1**

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## Practical No. 4 - Toposheet - Grid -referencing

**Aim :**

1) To understand the purpose of grid references
2) To locate a place on a toposheet with the help of its 6 –point grid reference.

**Introduction :**

You might have noticed by now that toposheets are covered in a series of grid lines or squares. These grid lines help you to pinpoint an exact location anywhere on the map. The vertical lines are called 'eastings', as they increase in value as you travel east on the map. The horizontal lines are called 'northings' as they increase in value as you travel north on the map. These lines help you in knowing the exact location of a place on a toposheet. A grid reference can be four digit or six-digit. A six-digit reference is a more exact way of locating a place than a four digit.

**Materials required :** Any toposheet with grid (preferably 1: 50000 scale). Teachers can download the toposheets of respective districts from https://soinakshe.uk.gov.in/ and print them for use in the class.

**Procedure :**

1) Take the toposheet and select any place. It can be a town or a city or a fort or a village.
2) Count the number of grids towards the east and towards the north. A six figure grid reference takes the form EEANNB. EE represents the easting which is immediately to the left of the object and NN represents the northing which is directly under it. Therefore EE and NN represent the four figure grid reference for the object in question. A is a digit which tells us how close to or far away from the easting the object is located. The higher the number, the farther away from the easting the object is. Similarly, B is a digit which tells us how close to or far away from the northing the object is found. X and Y can have a value ranging from zero to nine
3) To determine the 3rd and the 6th digit, we need to divide the space between easting and the northing before the place and easting and the northing after the place into ten equal parts.
4) This will give the exact location of the place.
5) With the help of the above explanation, complete the table below. An example has been given.

| Sr. No. | Grid Reference | Easting | Northing | Name of the location |
|---|---|---|---|---|
| 1 | 223456 | 22 | 45 | Village X |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |

## Practical No. 5 - Toposheet - Interpretation of Relief

**Aim :**

1) To understand how relief is shown on a toposheet.
2) To interpret various landforms, slope and relief shown on the toposheet.

**Introduction :**

You know that toposheets contain a lot of information. After giving the preliminary information, one starts with interpreting the toposheet. To interpret a toposheet, one needs to

see the following items :

1) Relief
2) Drainage
3) Vegetation
4) Human Settlements
5) Occupations
6) Transport and Communication

**Materials required :** Any toposheet preferably 1: 50000 scale. Teachers can download the toposheets of respective districts from https://soinakshe.uk.gov.in/ and print them for use in the class. We have taken 63 K/12 as example.

**Procedure :**

**STEP 1 -** After looking at the marginal information, look for contour interval. Also look for contour patterns of contours and with the help of profiles, interpret the major landforms.

**STEP 2 -** Look for the highest points – BM, Spot heights and triangulation points. This will give an idea of the slope and general altitude of the place.

- Convert 1:50,000 into a verbal scale using metric system.
- What is the value of the highest point on the map.
- What major landforms do you see in the toposheet?
- Name the major physical divisions you see in the toposheet .
- What is the average elevation of the area in the north part of the toposheet?
- What is the difference in the elevation of the southern part and the northern part of the toposheet?
- Comment upon the nature of the contours in the southern part.
- Write a short paragraph on the relief of the area shown in the toposheet

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## Practical No. 6 - Toposheet - Interpretation of Drainage

**Aim :**

1) To understand how drainage is shown on a toposheet.
2) To identify rivers, their origin, direction of flow, landforms carved by them, tributaries and transport.

**Introduction :**

You know that toposheets contain a lot of information. After giving the preliminary information, one starts with interpreting the toposheet. To interpret a toposheet, one needs to see the following items :

1) Relief 2) Drainage 3) Vegetation

**Materials required :** Any toposheet preferably 1: 50000 scale. Teachers can download the toposheets of respective districts from https://soinakshe.uk.gov.in/ and print them for use in the class. We have taken 63 K/12 as example.

**Procedure :**

**STEP 1 -** After looking at the marginal information and relief, we look for the drainage system in the area. Note the major rivers and coastal areas, if any in the toposheet. Make use of conventional signs and symbols given in marginal information.

**STEP 2 -** Look for tributaries of the rivers. Note the places where tributaries are meeting the rivers.

**STEP 3 -** Look at the general relief of the area whether it is a plain or a hilly or a mountainous region. Look for major landforms by the rivers like the meanders, waterfall, flood plains, etc.

The teachers should ask questions in such a way that students will interpret the drainage aspects. Some sample questions are given here for toposheet number 63 K /12

1) Name the major river in the toposheet.
2) In which direction does the river flow.

- What are the landforms in the shape of loops being formed by the river known as?
- Name the waterfalls and the rivers on which they lie.
- Name the major tributaries of the main river which come from the Plateau region .
- By what names is river Khajuri known as in its upper and middle course?
- Comment upon the slope of the region on the basis of the drainage pattern in the area.
- Which bank of the main river is steeper?
- Are the rivers navigable throughout the year?
- Comment upon the drainage in the area in 5 sentences.

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## Practical No. 7 - Toposheet - Interpretation of Vegetation

**Aim :**

1) To understand how vegetation is shown on a toposheet.
2) To identify the types of vegetation and relate them with relief and drainage.

**Introduction :**

You know that toposheets contain a lot of information. After giving the preliminary information, one starts with interpreting the toposheet. To interpret a toposheet, one needs to see the following items:

1) Relief 2) Drainage 3) Vegetation

**Materials required :** Any toposheet preferably 1: 50000 scale. Teachers can download the toposheets of respective districts from https://soinakshe.uk.gov.in/ and print them for use in the class. We have taken one as example.

**Procedure :**

**STEP 1 -** After looking at the marginal information and relief, we look for the natural vegetation in the area. Make use of conventional signs and symbols given in marginal information which are important in interpreting the vegetation.

**STEP 2 -** Vegetation in a region is expressed by green colour. Presence of green colour shows vegetation. Shades of green show the density of forests.

**STEP 3 -** Look for any Reserved Forest , Protected forest, open scrub in the region.

**STEP 4 -** Identify important tree species, plantations or grasses given in the toposheet.

**STEP 5 -** Relate vegetation with relief and drainage.

The teachers should ask questions in such a way that students will interpret the vegetation aspects. Some sample questions are given here for toposheet number 63 K /12

- Which part of the toposheet is comparatively devoid of any vegetation? Why?
- Name the major forest regions in the area.
- Name the major tree species found in these areas,
- Comment upon the land use in the areas devoid of vegetation.
- Why is some part of plateau devoid of any vegetation?
- Name some villages with planted trees. What plantations could bethere?
- Comment upon the nature of vegetation in the area in 5 lines. Correlate with the relief and drainage in the area.

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# Practical No. 8 - Interpretation of Weather Maps -1

**Select any three weather charts out of five seasons:**

1) Summer
2) Winter
3) MONSOON
4) Retreating Monsoon
5) Cyclone (a map in which cyclones are visible)

**Aim :**

1) To understand the purpose of weather maps
2) To read and understand a weather map
3) To interpret a weather map and forecast the weather of a place

**Introduction :**

Weather denotes the atmospheric conditions of weather elements at a particular place and time. The weather elements include temperature, pressure, wind, humidity and cloudiness. Each day weather maps are prepared for that day by the Meteorological Department from the data obtained from observations made at various weather stations across the world. In India, weather-related information is collected and published under the auspices of the Indian Meteorological Department, New Delhi, which is also responsible for weather forecasting.

**Weather Maps :** A weather map is the representation of weather phenomena of the earth or a part of it on a flat surface. It depicts conditions associated with different weather elements such as temperature, rainfall, sunshine and cloudiness, direction and velocity of winds, etc. on a particular day. Such observations being taken at fixed hours are transmitted by code to the forecasting stations. Since the inception of the Indian Meteorological Department, the weather maps and charts are prepared regularly. Meteorological observatories transmit the data to the Central Observatory at Pune twice a day.

**Weather Charts :** The data received from various weather observatories are in plenty and detailed. As such, they cannot be incorporated in one single chart unless the coding designed to give the economy of expression is used. These are called synoptic weather charts and the codes used are called meteorological symbols. Weather charts provide the primary tools for weather forecasting. They help in locating and identifying different air masses, pressure systems, fronts and areas of precipitation.

**Weather symbols :** The messages received from all the observatories are plotted on the map using weather symbols standardized by the World Meteorological Organization and the National Weather Bureaus. See the adjoining figures to understand what each symbol means.

Much of the climatic data is represented by line symbols. The most common of these are the isometric lines. These lines are depicted on the map as isopleths. The Isopleths can be interpolated for places having the same mean values of temperature, rainfall, pressure, sunshine, clouds, etc. Some of these lines and their uses are mentioned below:

Isobars : Lines connecting places of equal air pressure.

Isotherms : Lines connecting places of equal temperature.

Isohyets : Lines connecting places of equal amount of rainfall over a given period of time.

Isohels : Lines connecting places of same mean daily duration of sunshine.

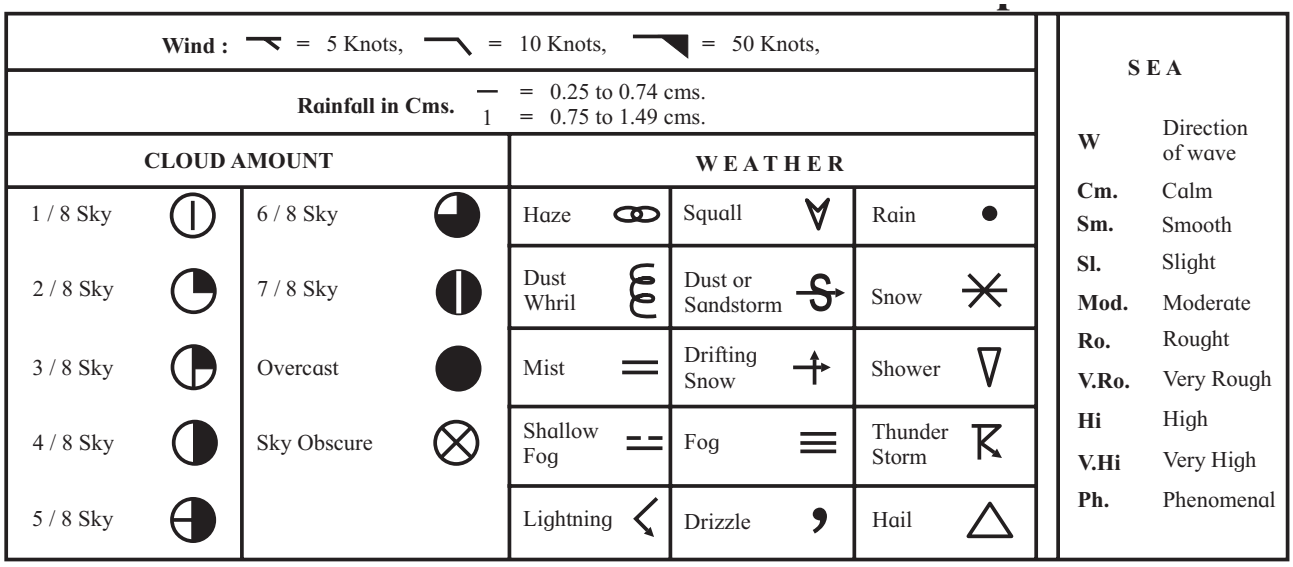


**Fig. 8.1 IMD Weather symbols**

Isonephs : Lines connecting places of same mean value of cloud cover.

**Materials required :** Five IMD weather maps representing five different seasons-summer, monsoon, retreating monsoon, cyclone and winter.

**Procedure :**

On the basis of the above information, we can analyze a weather map and understand the general pattern of weather conditions prevailing in different parts of the country.

See the weather symbols and try to remember what each one of them signifies. On the basis of the following heads, interpret the information given in the weather map.

1) **Introduction :** First look at the date of the weather map. Mention the date, day, year and month of the map. Also mention the time at which it has been presented. Also mention the season.

2) **Pressure distribution :** Under this head, you mention the low pressure areas and high pressure areas. You will understand these areas with the help of isobars. Mention the values of the isobars. Isobar values are in millibars (mb) or HectaPascal (HPa).

a) Also look at the patterns of isobars. Different shapes indicate different weather conditions. e.g. Cyclones are indicated by a circular isobaric pattern. A 'V' shape indicates low pressure area.

b) Direction of isobars : look at the trend of isobars. This means what is their direction? In which direction is the low pressure or the high pressure. Generally, the isobars are closely spaced and parallel to each other at the coastal areas in an east-west direction. On the other hand, they are spiral on land.

c) Pressure Gradient- It is the difference between the values of the highest isobar and the lowest isobars. If the isobars are closely spaced, it shows high gradient. If they are away from each other, then the gradient is low. The gradient determines the wind velocity. High gradient shows high wind velocity.

3) **Winds :** the wind velocities are shown by lines attached to circles on a map. A wind is named after the direction it comes from. For example, if a line is joint to a circle in eastern direction, then it shows that the wind is coming from east. The symbol also denotes the sped of the wind in knots. Refer to the symbol chart for speed of the wind.

4) **Cloud Cover :** Spheres are used to show the ratio of cloud cover in the sky. The way they are coloured in black tells the

intensity of cloud cover. This ranges from 1/8th of the cloud to total overcast (fully covered). While interpreting you should also link cloud coverage with chances of precipitation in an area.

5) **Sea condition :** To know the weather conditions at Bay of Bengal, Indian Ocean and Arabian Sea, refer to the weather symbols which show sea conditions. They can be rough or very rough or calm. This should be linked to the weather conditions of the rest of the country. Also the direction of the sea waves needs to be mentioned.

6) **Temperature conditions :** Besides the main map, two maps are given which shows departure from average temperature of the country. These departures are shown through isotherms. These will give you an idea of the temperatures of various parts of the country. These are mainly used for forecasting for the next 24 hours .

7) **Other weather conditions :** Other weather conditions like hail, fog, snow, precipitation, etc are shown by specific weather symbols.

With the help of the above given points, you have to interpret the weather conditions of 3 different seasons. One has been done for you as example. The teachers can also ask questions in such a way that interpretation of weather maps becomes easier. Some examples of questions are given below. Teachers can choose to give different questions of their own. Choose any 3 Plates from Plate 1 to Plate 8 for interpretation of Weather Maps in Practical No 8 , 9 and 10.

Study the map and answer the following questions for practical 8.

- Which season is being shown in this map?
- What is the value of the highest isobar and through which part of the country does it pass?
- What are the values of the highest and the lowest isobars and where are they located?
- What are the patterns of temperature distribution in both the maps?
- In which parts do you see the highest and the lowest mean temperatures?
- What relationship do you see between the distribution of temperature and pressure in both the maps?

## Practical 9 - Interpretation of Weather Maps -2

- Which season is being shown here.?
- What does SCS mean?
- Where do you see a high pressure area?
- In which part of the country is the maximum temperature less by 6 degrees than normal?
- In which part of the country is the minimum temperature 4 degrees more than normal temperature ?
- What is the wind velocity in the area under VSCS?
- In which parts do ypu observe the sky is obscured?
- In which part of the country can one observe haze?
- Write a concluding statement about the weather conditions in the country.

## Practical 10 - Interpretation of Weather Maps -3

- Which season is shown here?
- In which part of the map do you see a high pressure area? Why?
- What is the lowest value of isobar?
- Which area do you see the isobars are closely spaced?
- Which part of the country is experiencing minimum temperatures 4 degrees below the normal?
- Which part of the country is experiencing rainfall?
- Write a concluding statement about the weather of the country

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# Practical No. 11 - Use of GPS to find area and perimeter

**Introduction :**

You can find out the location of any place on the earth with the help of GPS instruments. Like the internet and mobile, GPS is an essential element of the global information infrastructure. The free, open and dependable nature of GPS has led to the development of hundreds of applications affecting every aspect of modern life.

GPS is used in farming, communication network, banking, financial markets, supply management system, mining, surveying, package delivery, security and tracking crimes, weather forecasting, earthquake monitoring, environmental protection, etc. A GPS consists of three segments:

a) **Space or satellite :** Each GPS needs to be connected to satellites. These satellites are orbiting around the earth around 20,200 kms above the earth. Each satellite circles the Earth twice a day.

b) **Control Segment :** This segment consists of ground stations located around the world. They track the GPS satellites, monitor their transmission, perform analysis and send commands and data to the constellation to make sure the satellites are working properly.

c) **User Segment :** This consists of our instrument which receives satellite signals and transmits information to user for calculating position, time and speed. (fig. 11.1)

**Aim :**

1) To find out the latitude and longitude of a place with the help of GPS (Global Positioning System) instrument.
2) Measure perimeter and area of a plot.

**Materials required :** A smartphone with internet facility,( can use GPS hand-held instrument too), notepad, pen, pencil

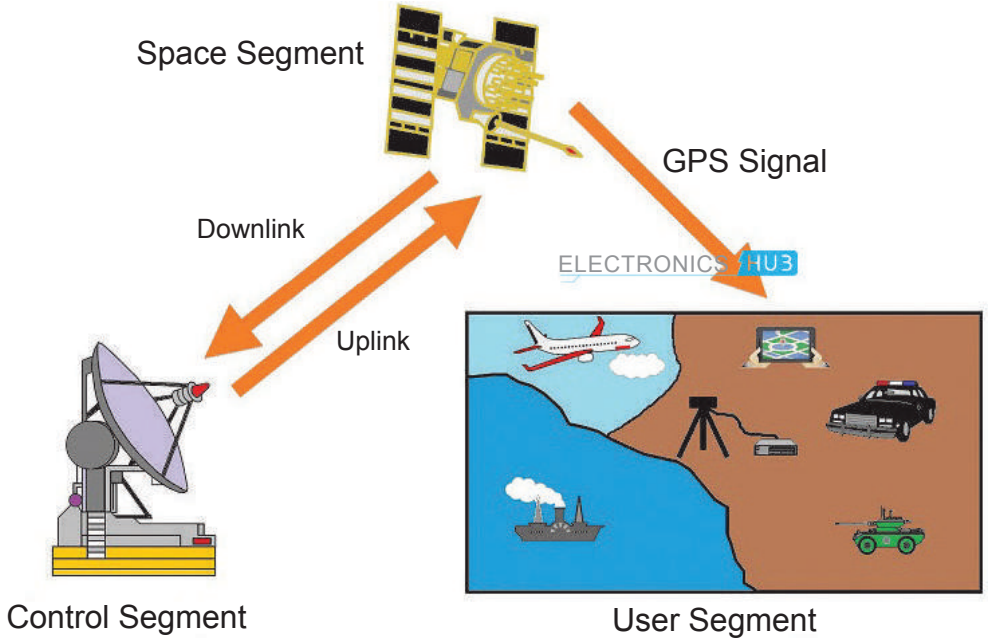



**Fig. 11.1**

**PART I: Determining latitude and longitude of a place**

**Procedure :**

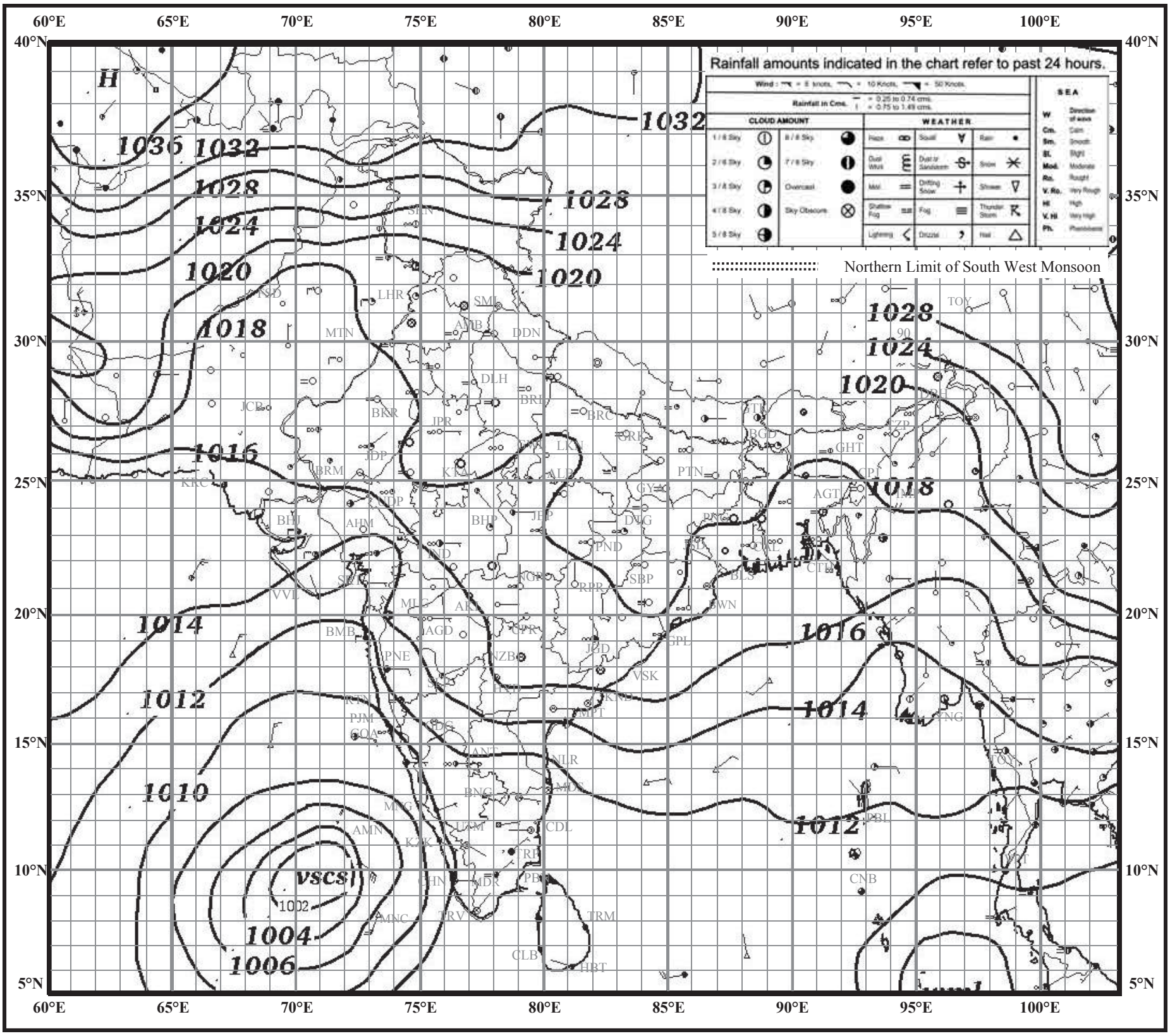
1) Take a Smartphone and install the Simple GPS app from Google Play Store. Following screen will appear. Fig. 11.2.

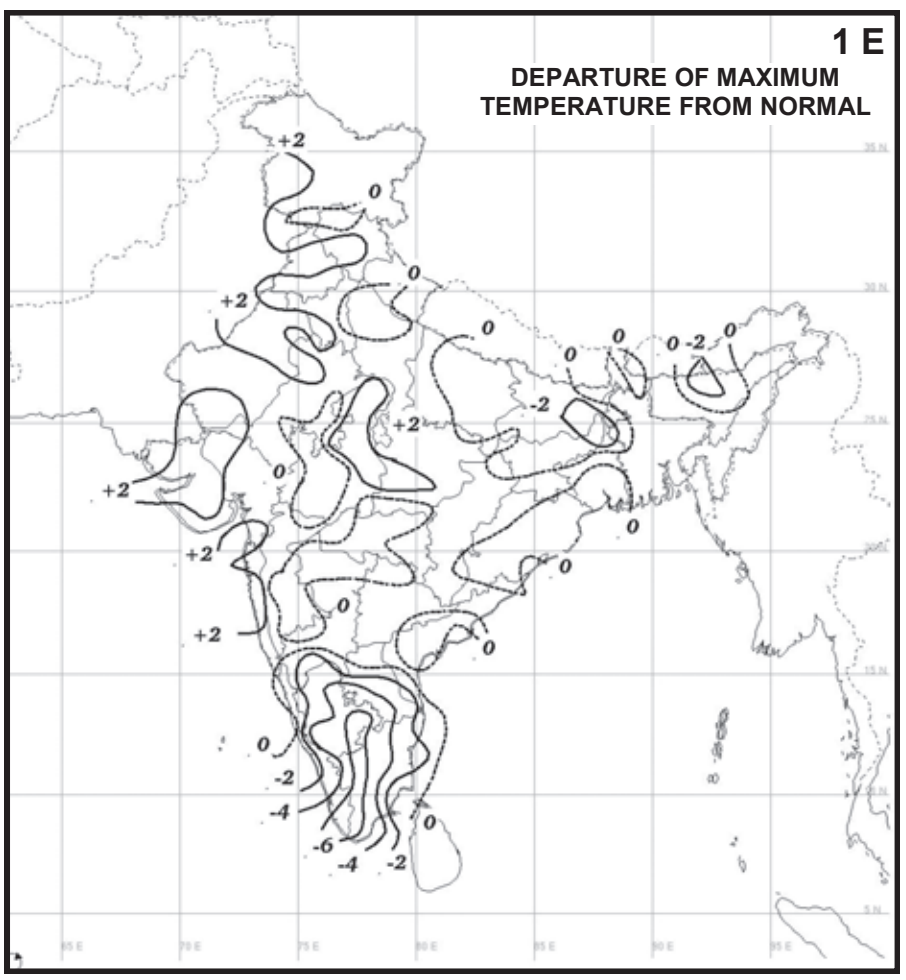
# INDIAN DAILY WEATHER REPORT

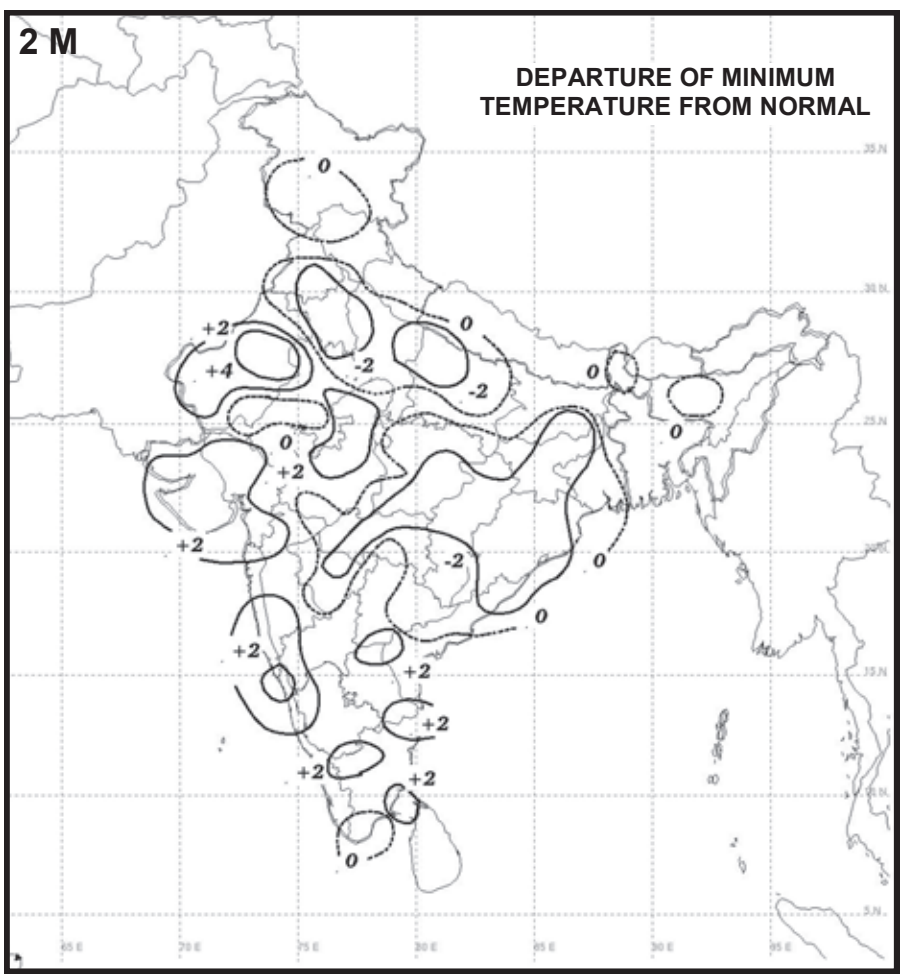
## WEATHER MAP AT 0830 hrs. I.S.T. (0300 hrs. U.T.C.)

### Saturday, 02 December 2017 (11 Agrahayana 1939 Saka)

**PLATE - 1**



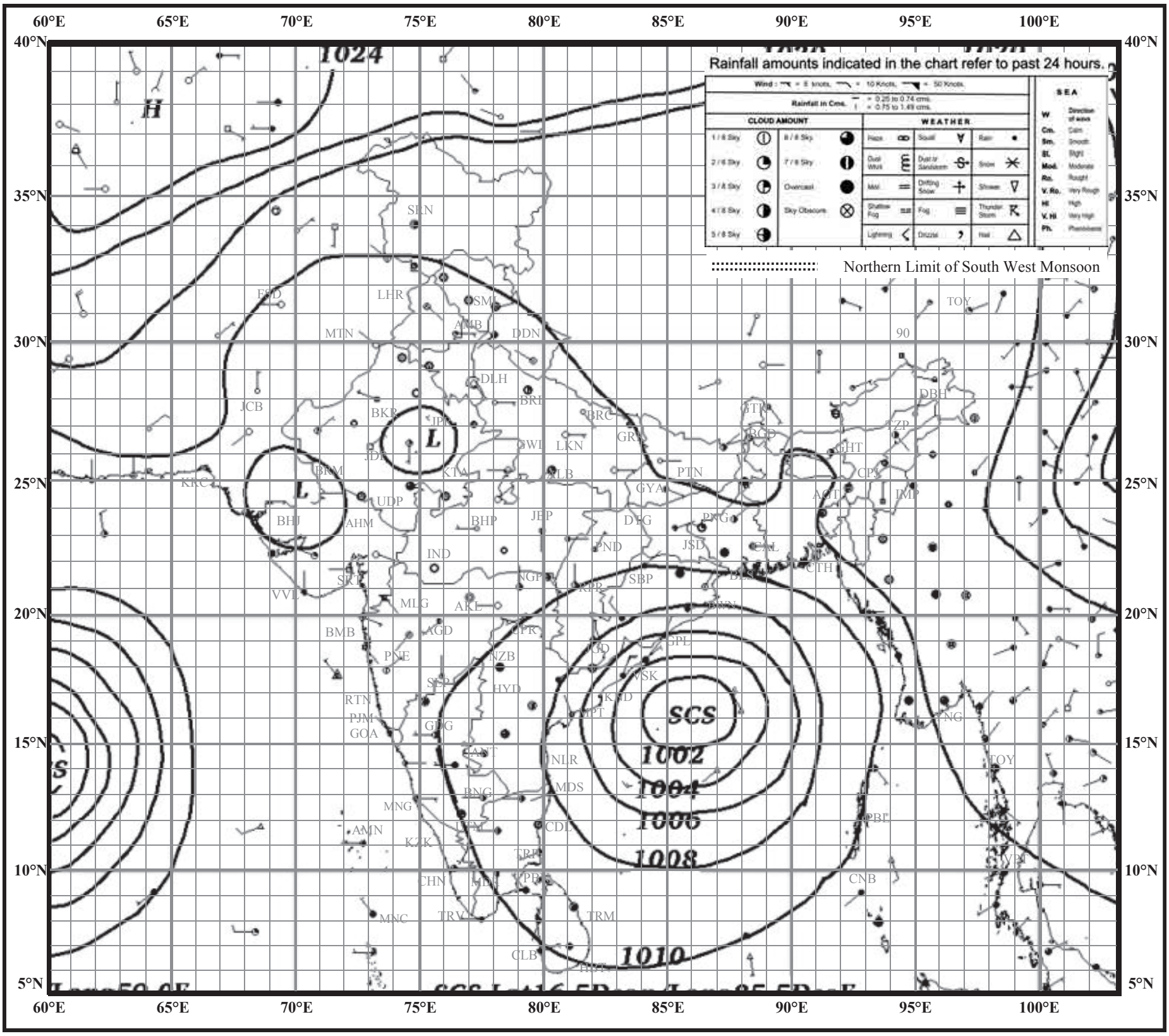



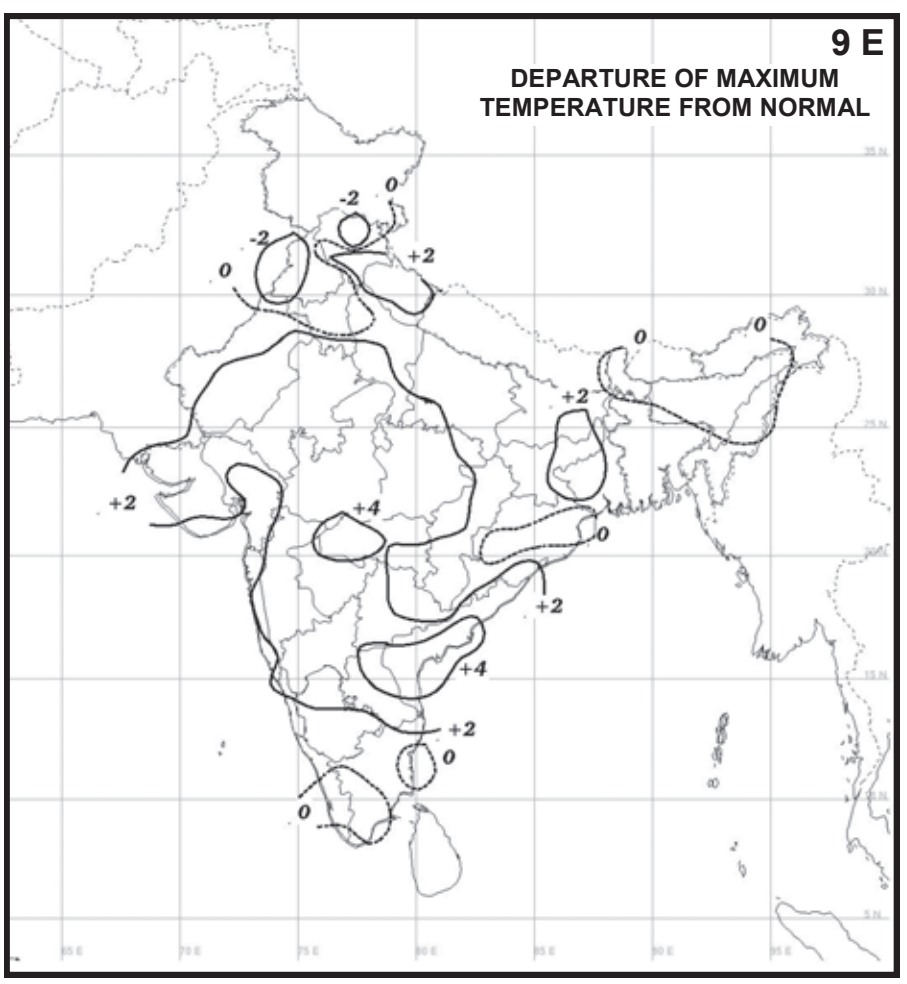
# INDIAN DAILY WEATHER REPORT

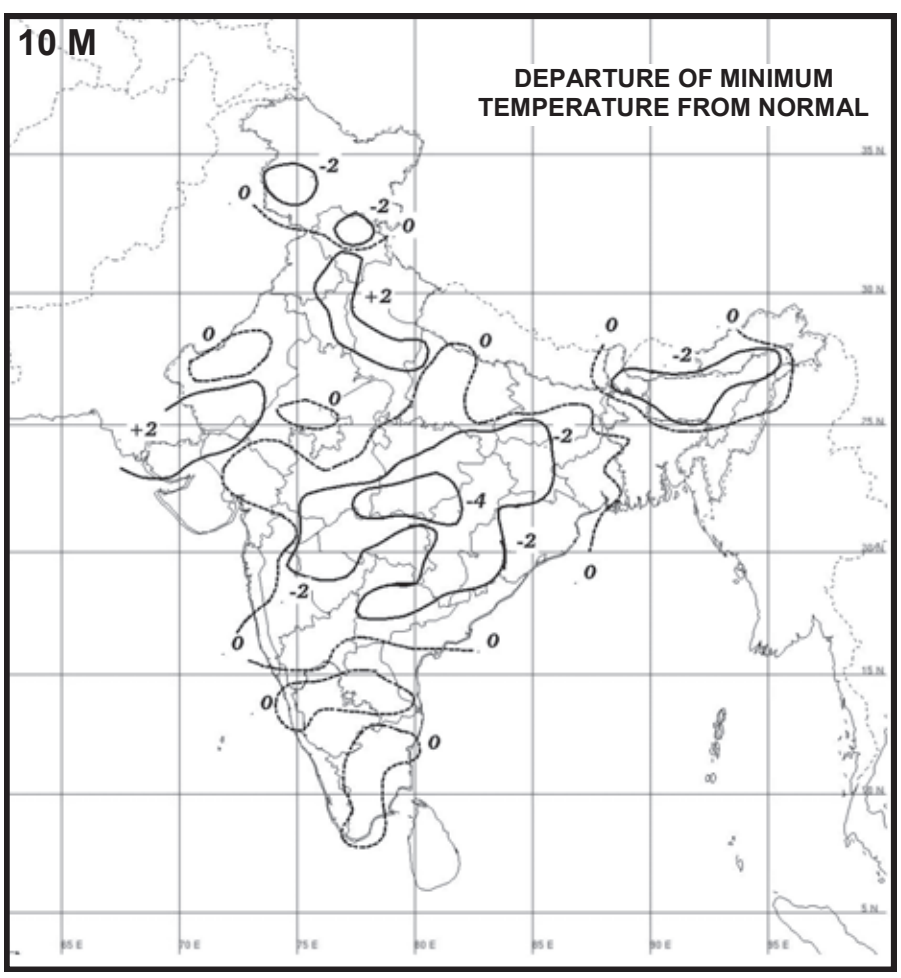
## WEATHER MAP AT 0830 hrs. I.S.T. (0300 hrs. U.T.C.)

### Wednesday, 10 October 2018 (18 Asvina 1940 Saka)

**PLATE - 2**



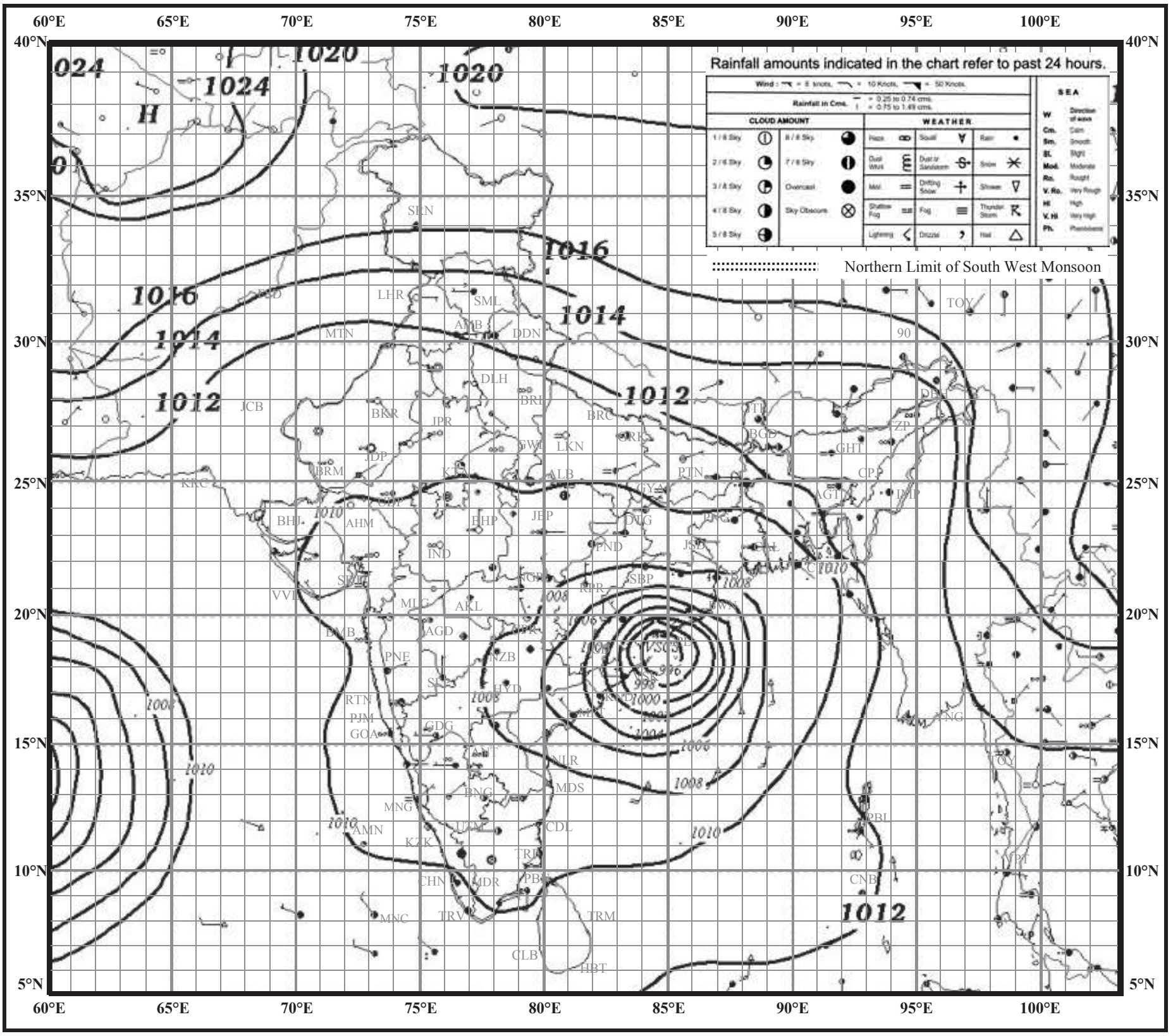



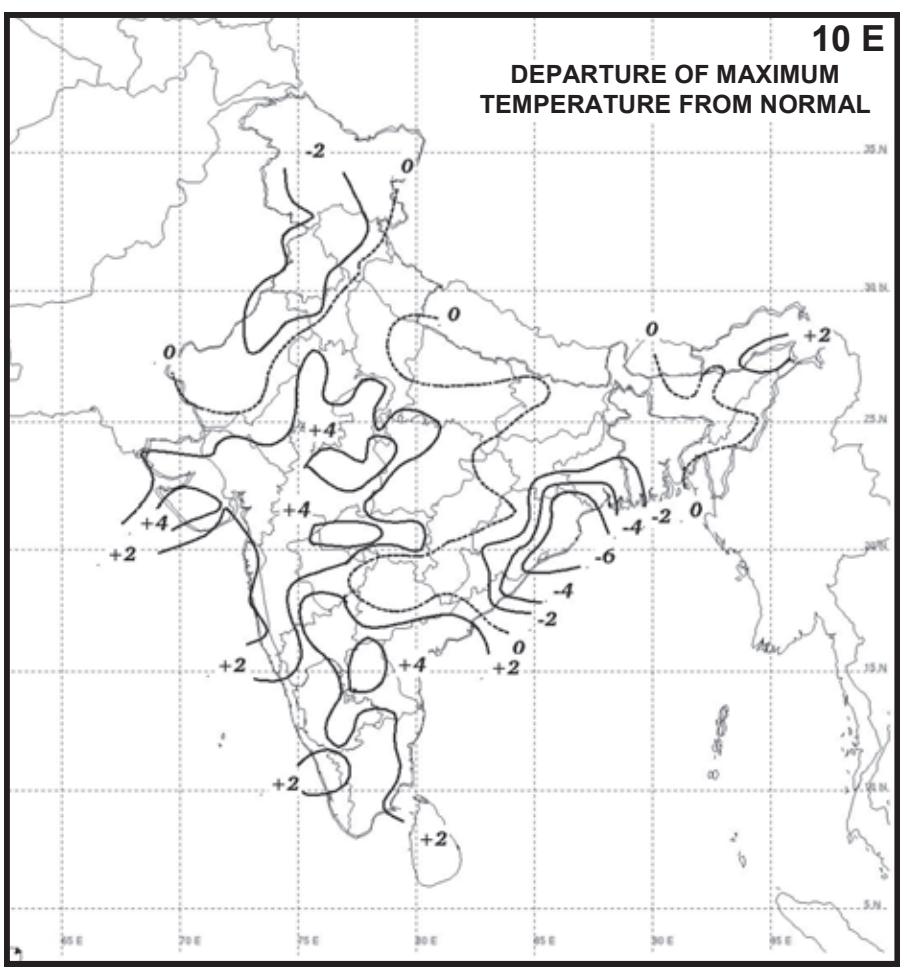
# INDIAN DAILY WEATHER REPORT

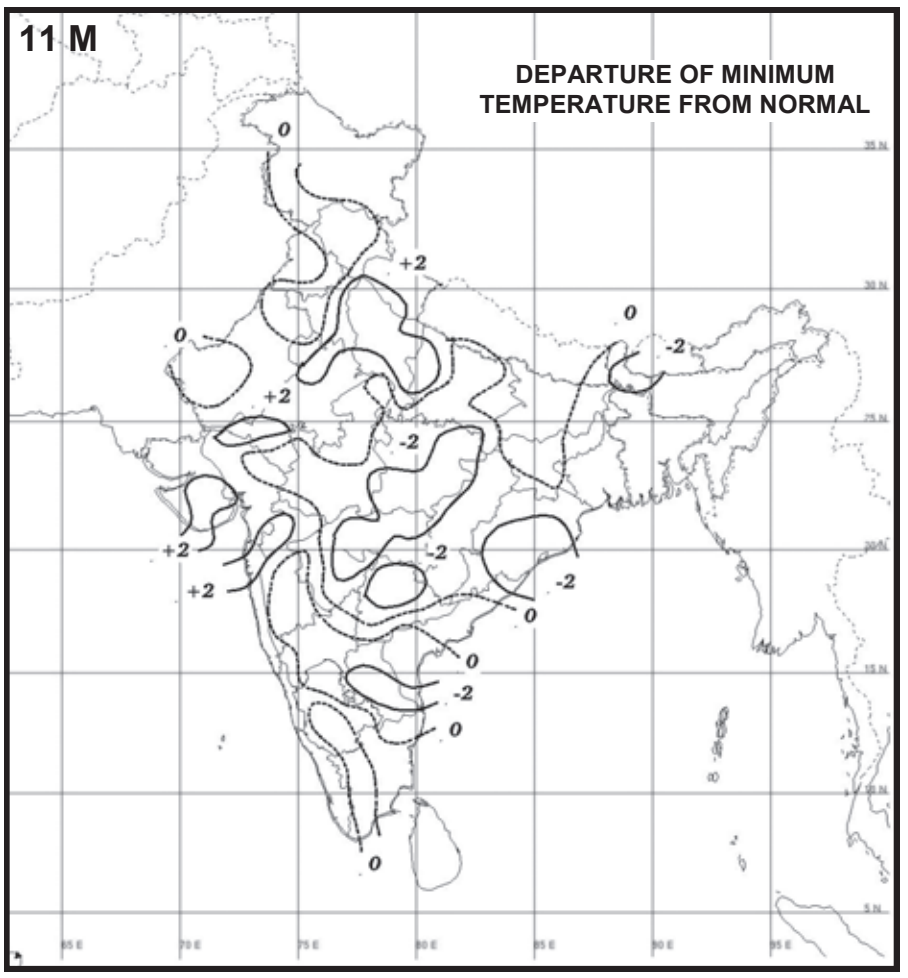
## WEATHER MAP AT 0830 hrs. I.S.T. (0300 hrs. U.T.C.)

### Thursday, 11 October 2018 (19 Asvina 1940 Saka)

**PLATE - 3**



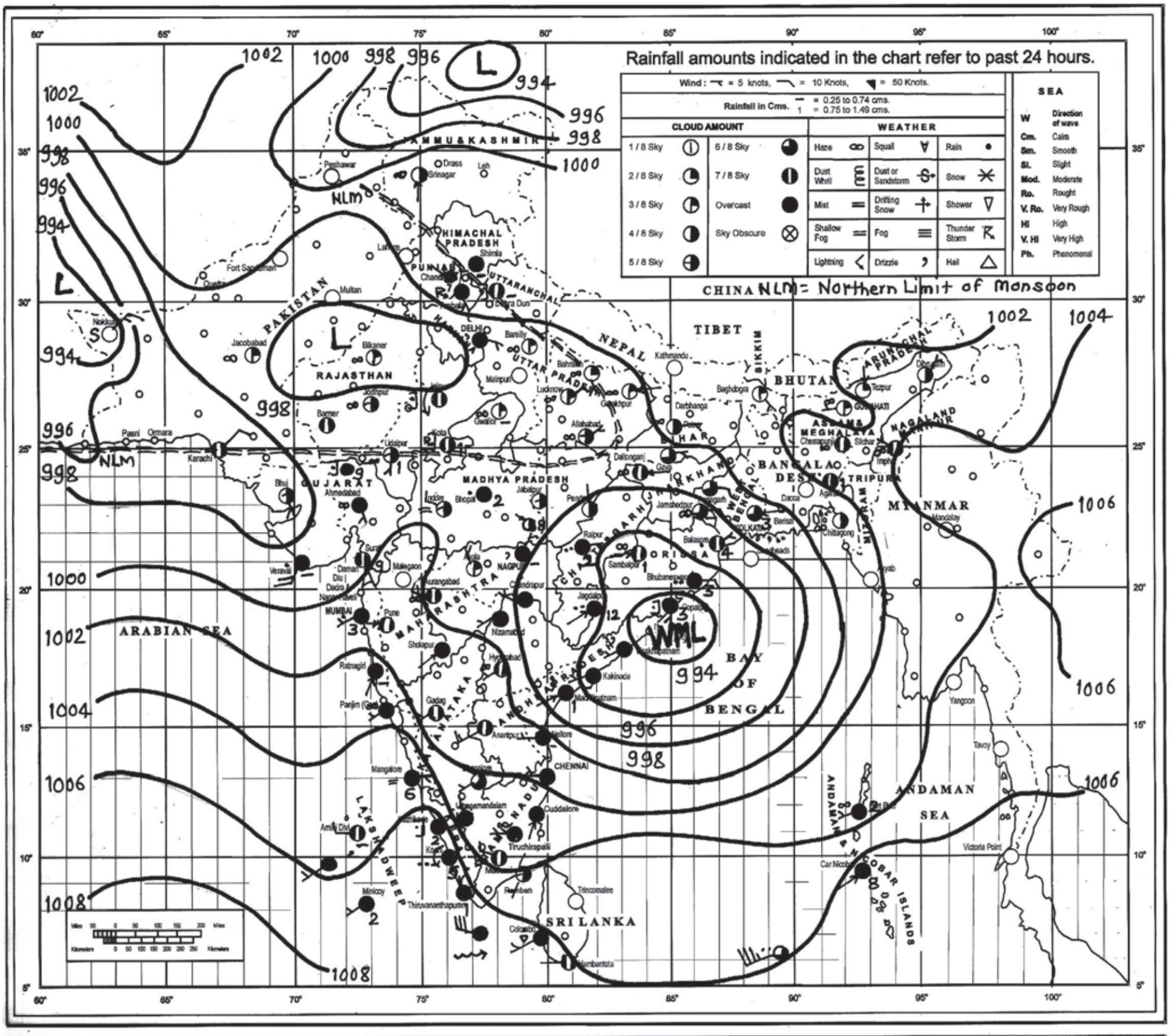



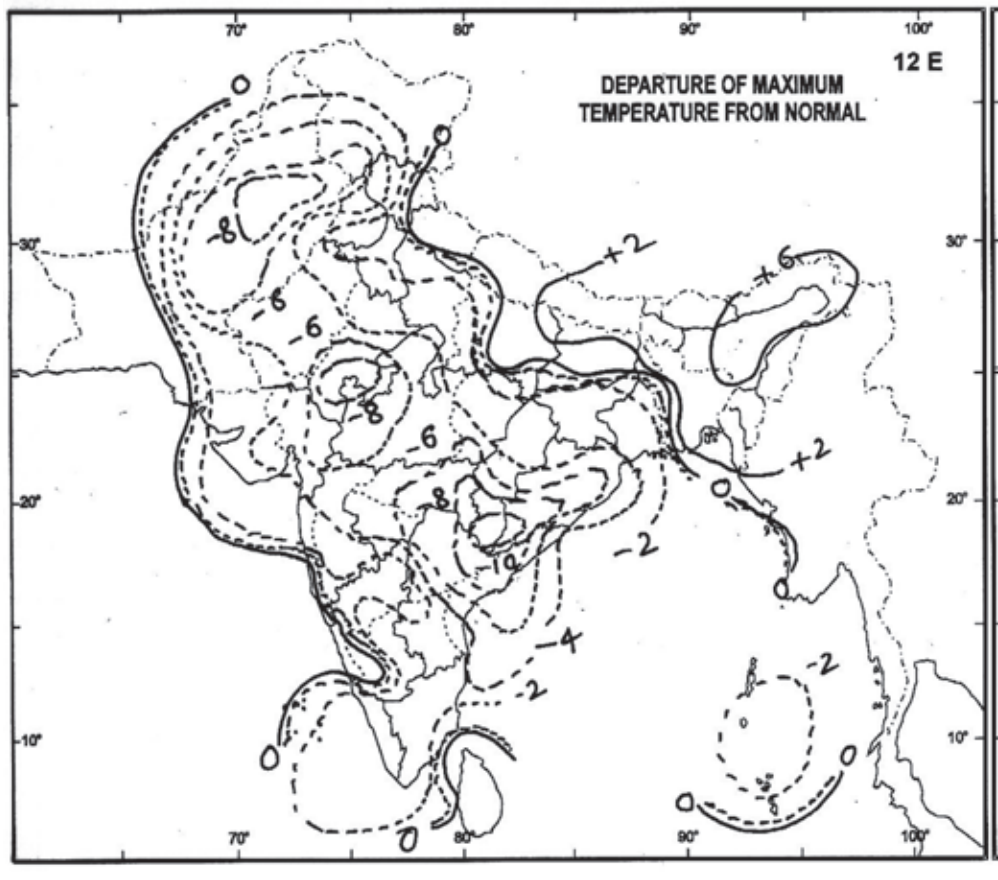
# INDIAN DAILY WEATHER REPORT

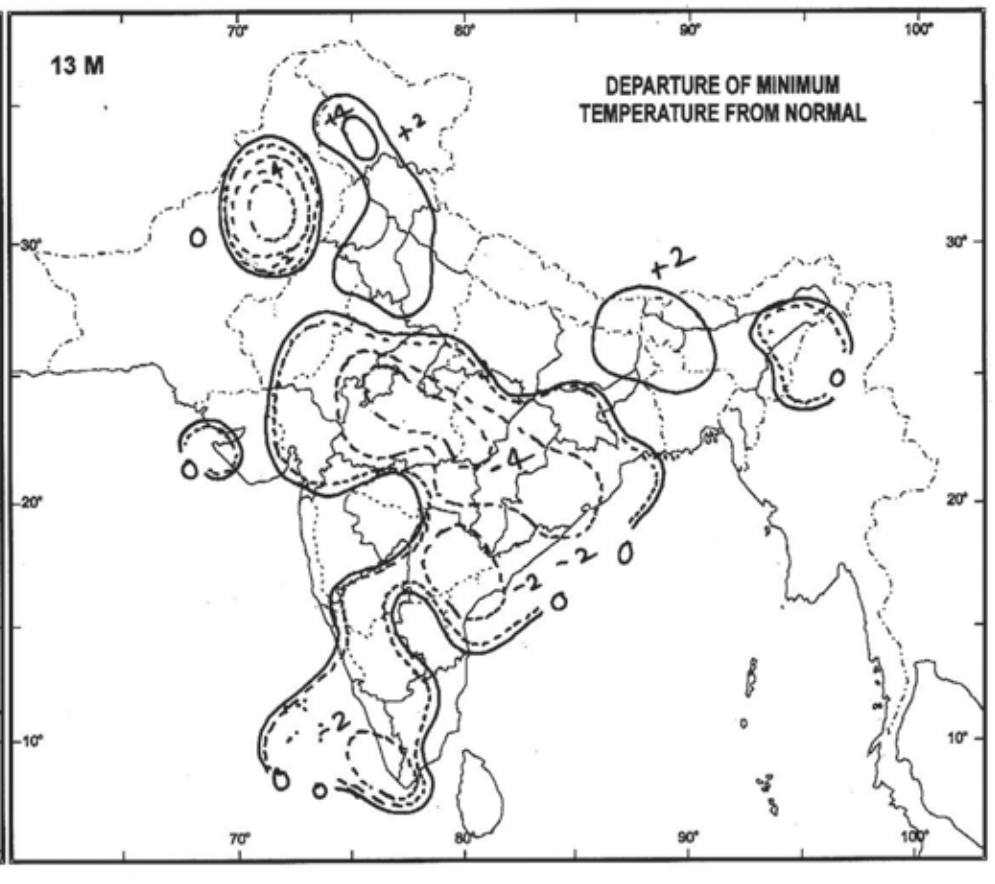
## WEATHER MAP AT 0830 hrs. I. S. T. (0300 hrs U.T.C.)

### Thursday, 13 June 2013 (23 Jyaistha 1935 Saka)

**PLATE - 4**



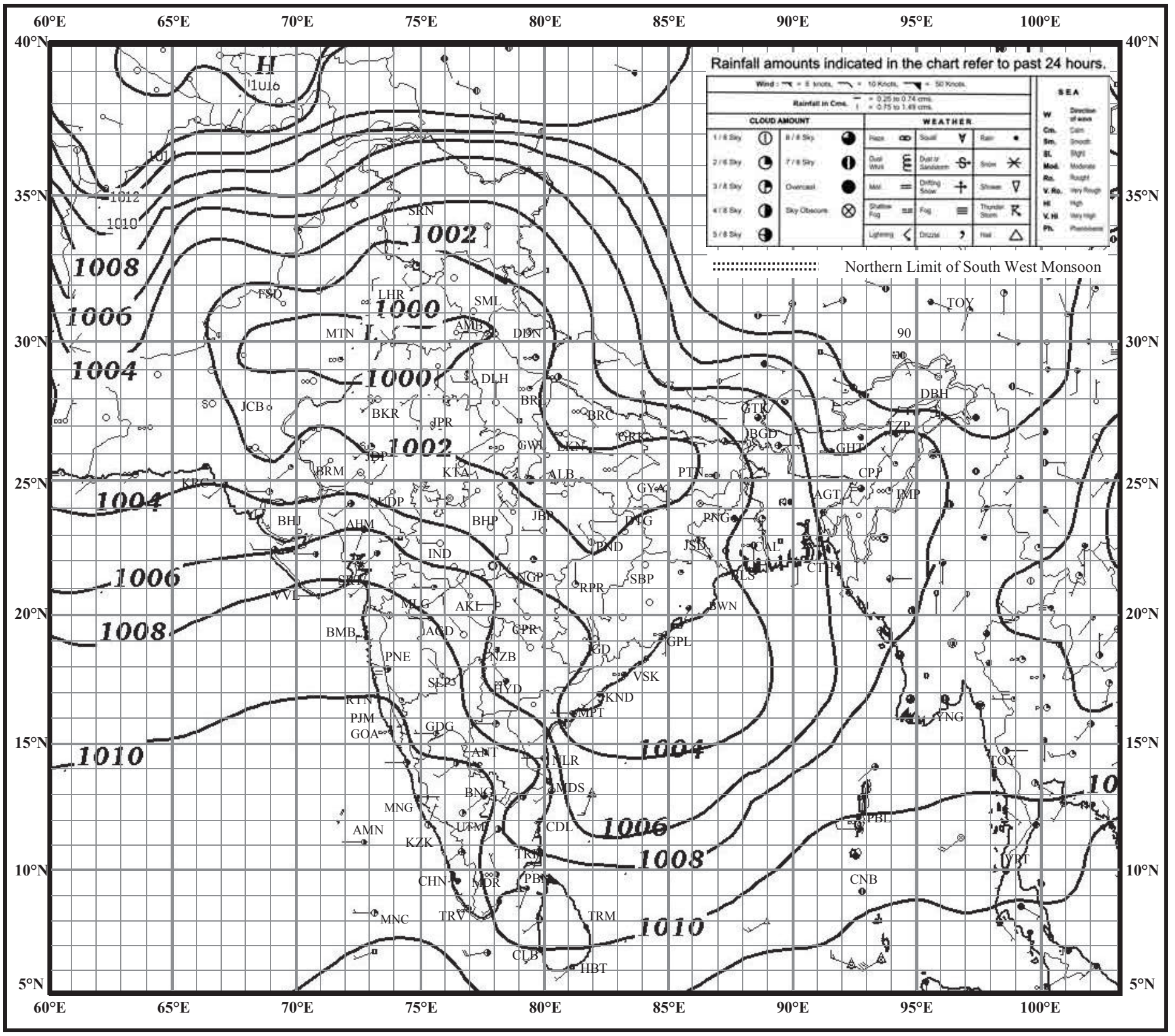



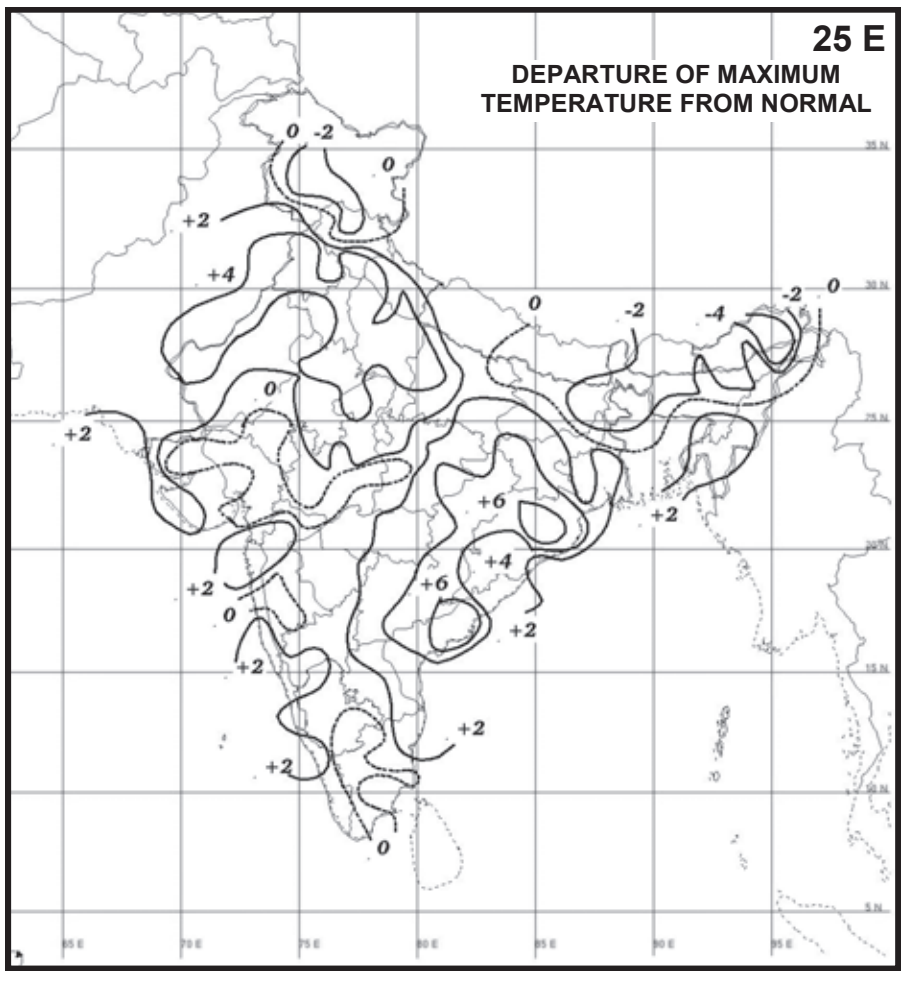
# INDIAN DAILY WEATHER REPORT

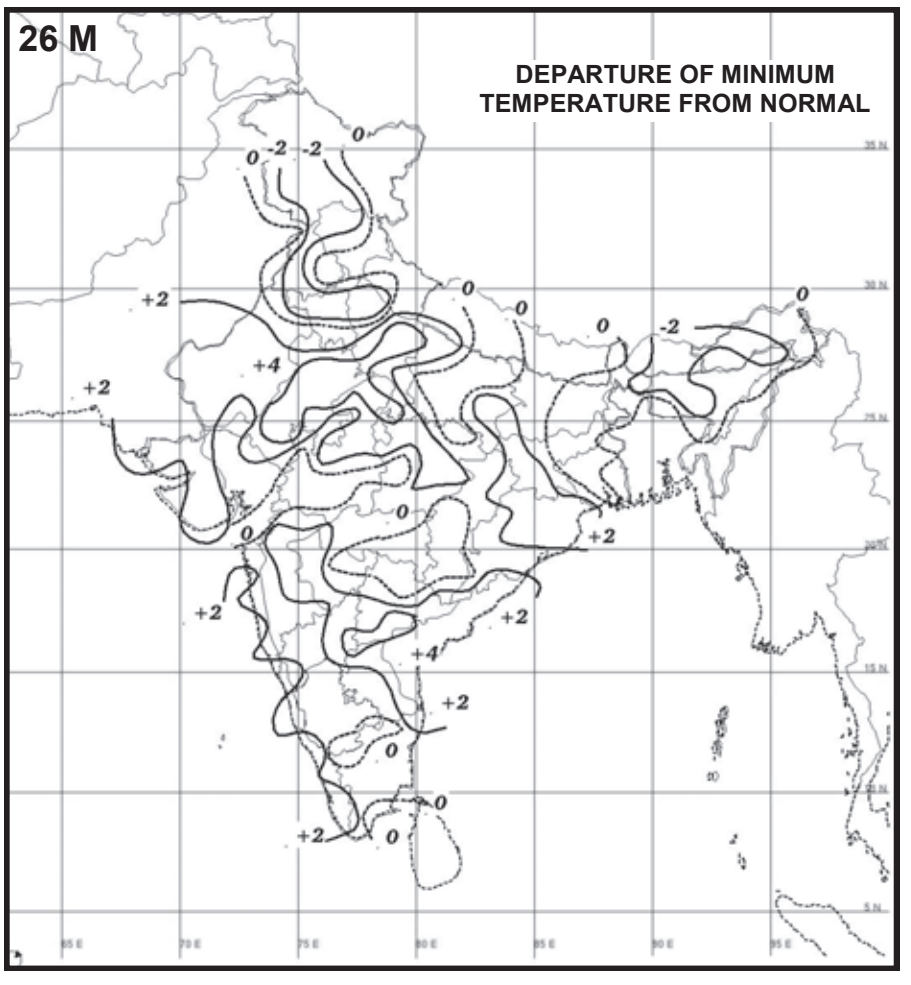
## WEATHER MAP AT 0830 hrs. I.S.T. (0300 hrs. U.T.C.)

### Tuesday, 26 May 2015 (05 Jyaistha 1937 Saka)

**PLATE - 5**



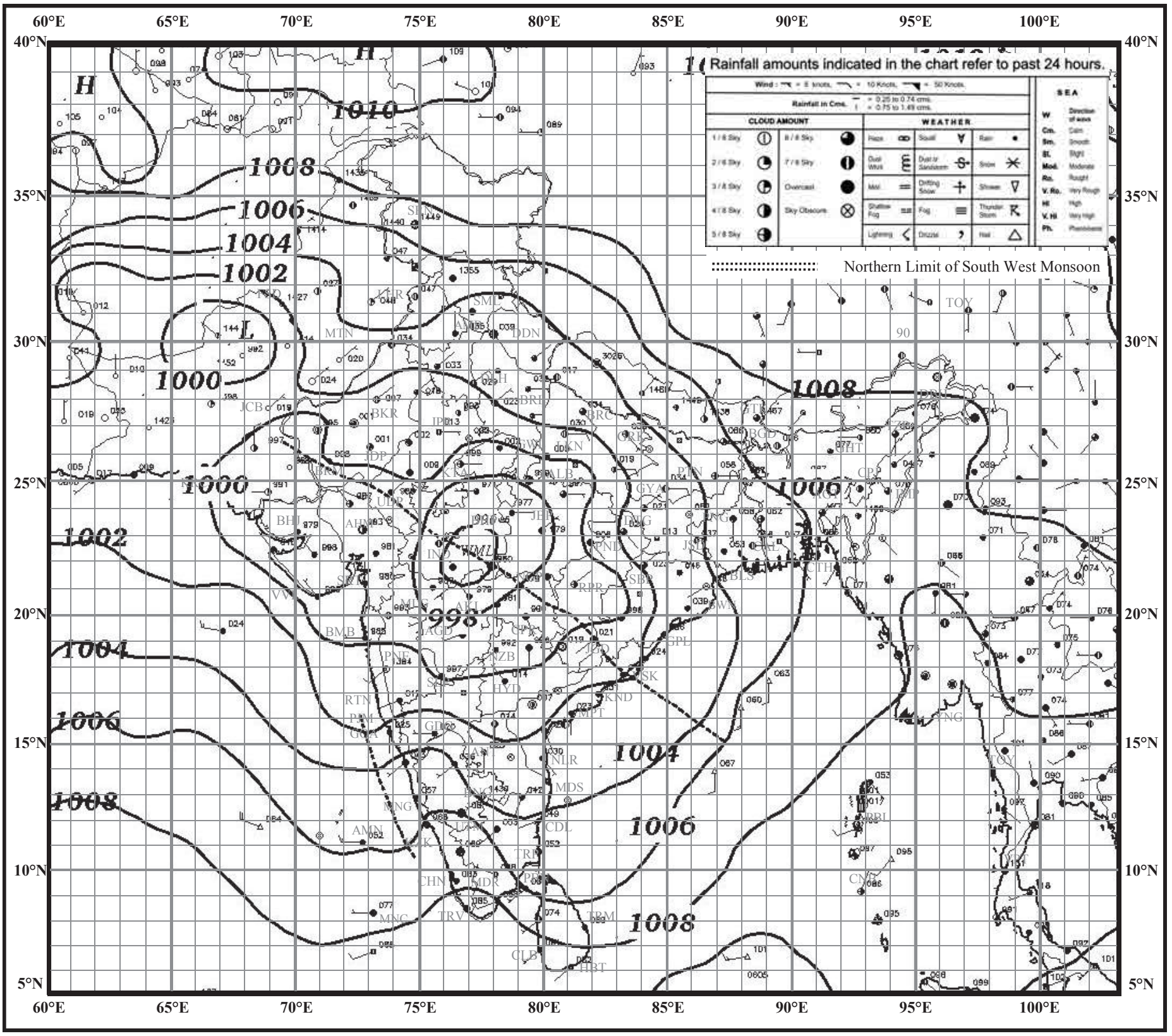



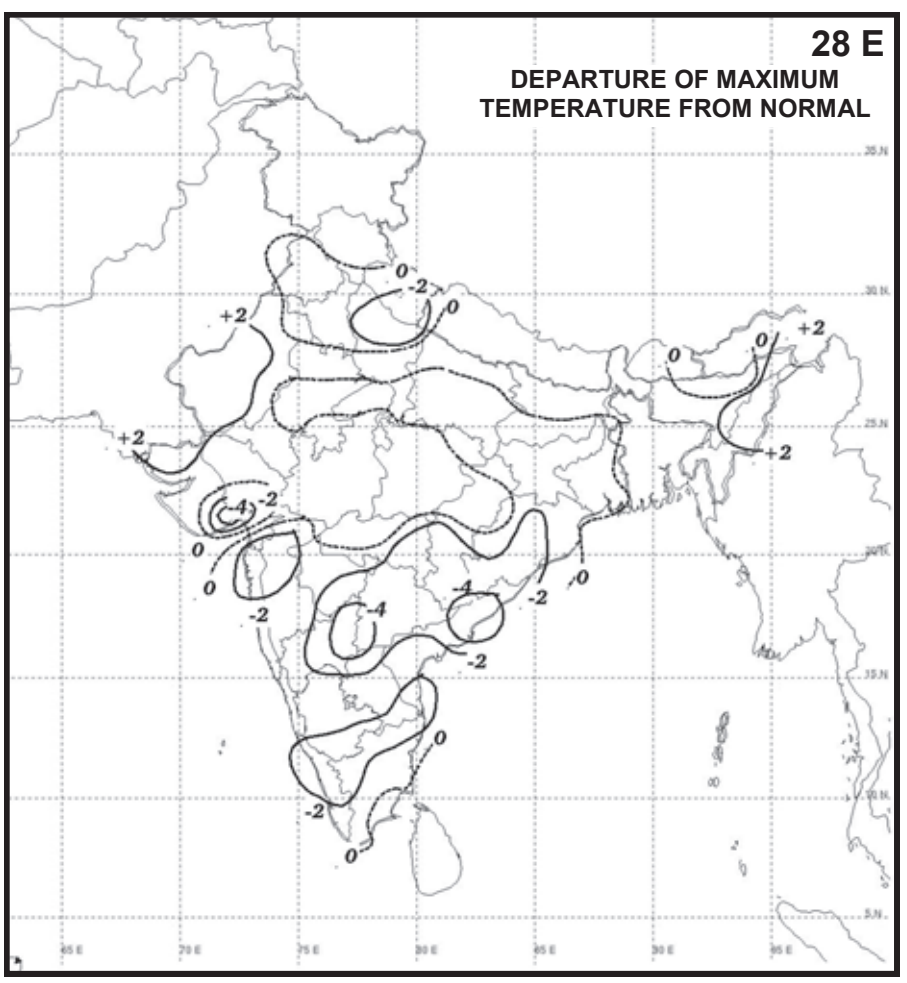
# INDIAN DAILY WEATHER REPORT

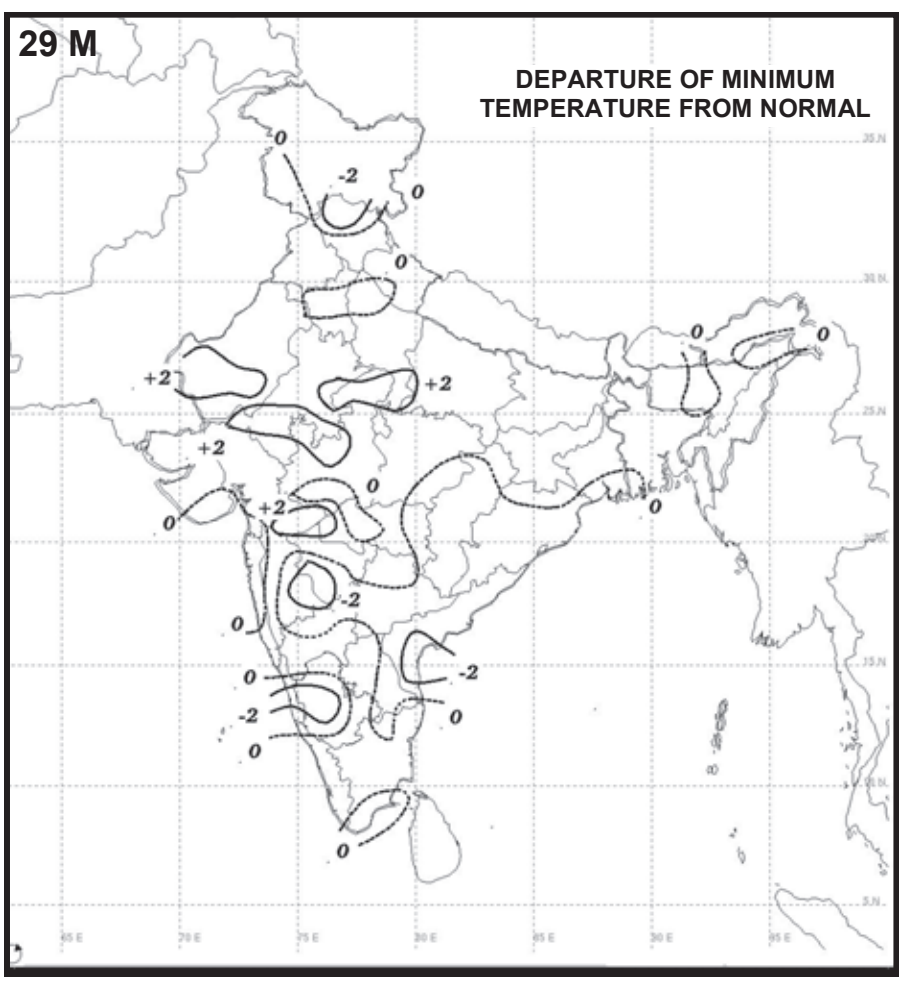
## WEATHER MAP AT 0830 hrs. I.S.T. (0300 hrs. U.T.C.)

### Tuesday, 29 August 2017 (07 Bhadrapada 1939 Saka)

**PLATE - 6**



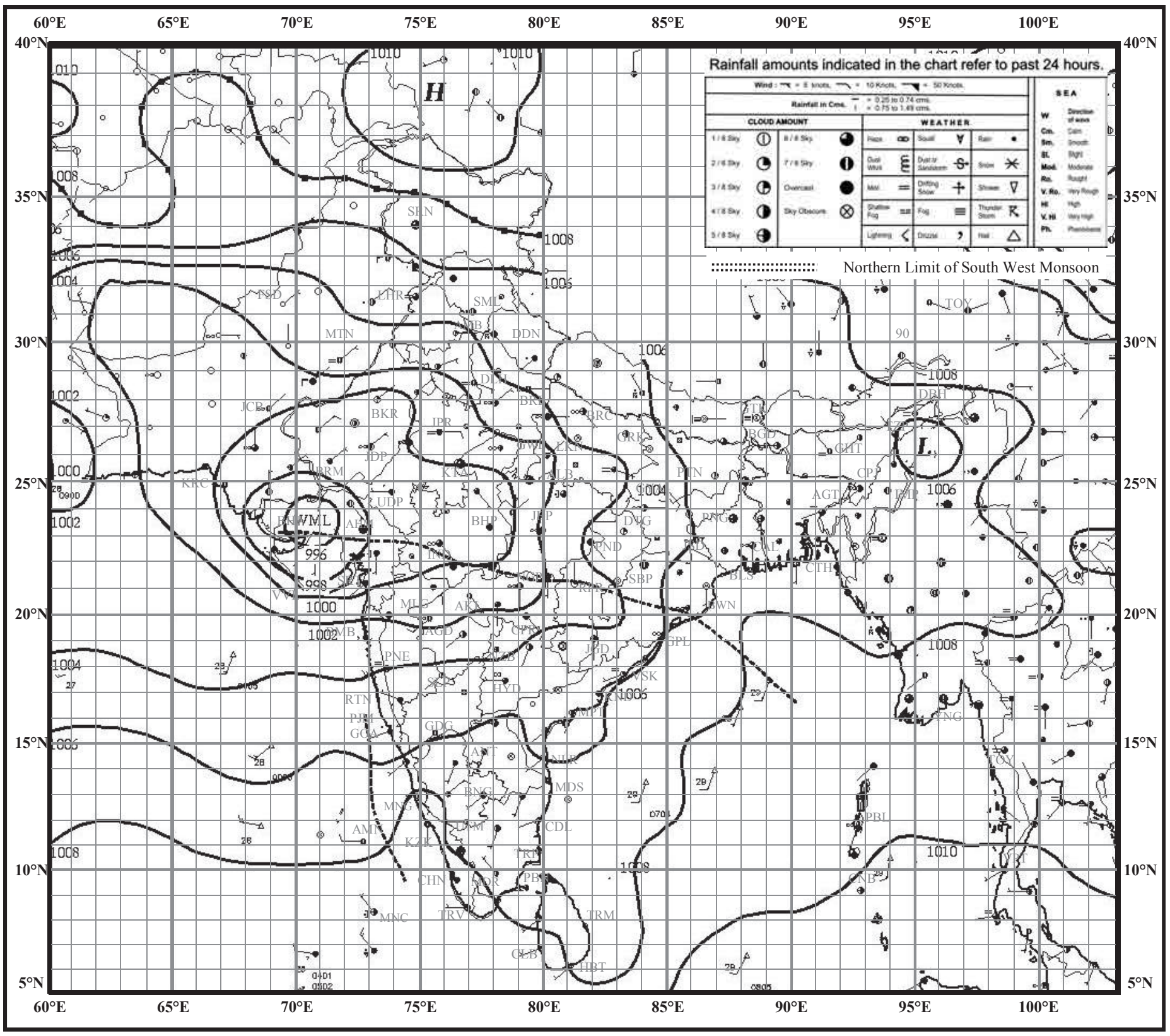



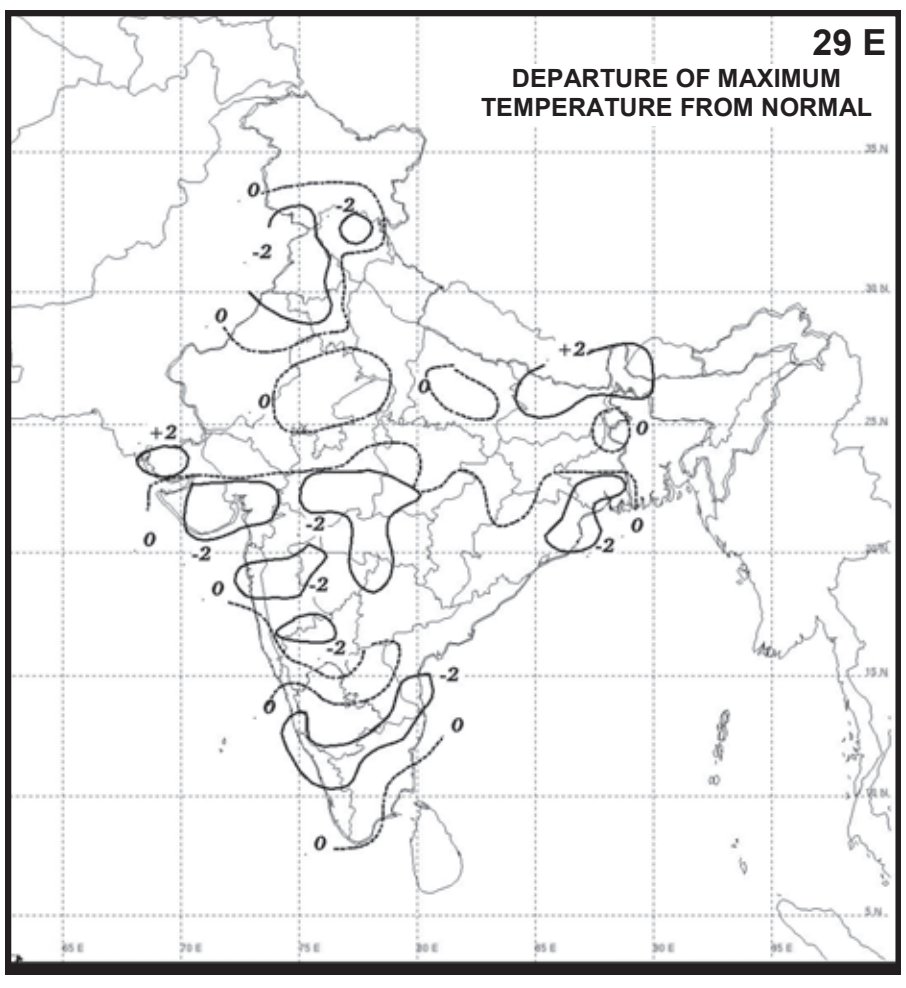
# INDIAN DAILY WEATHER REPORT

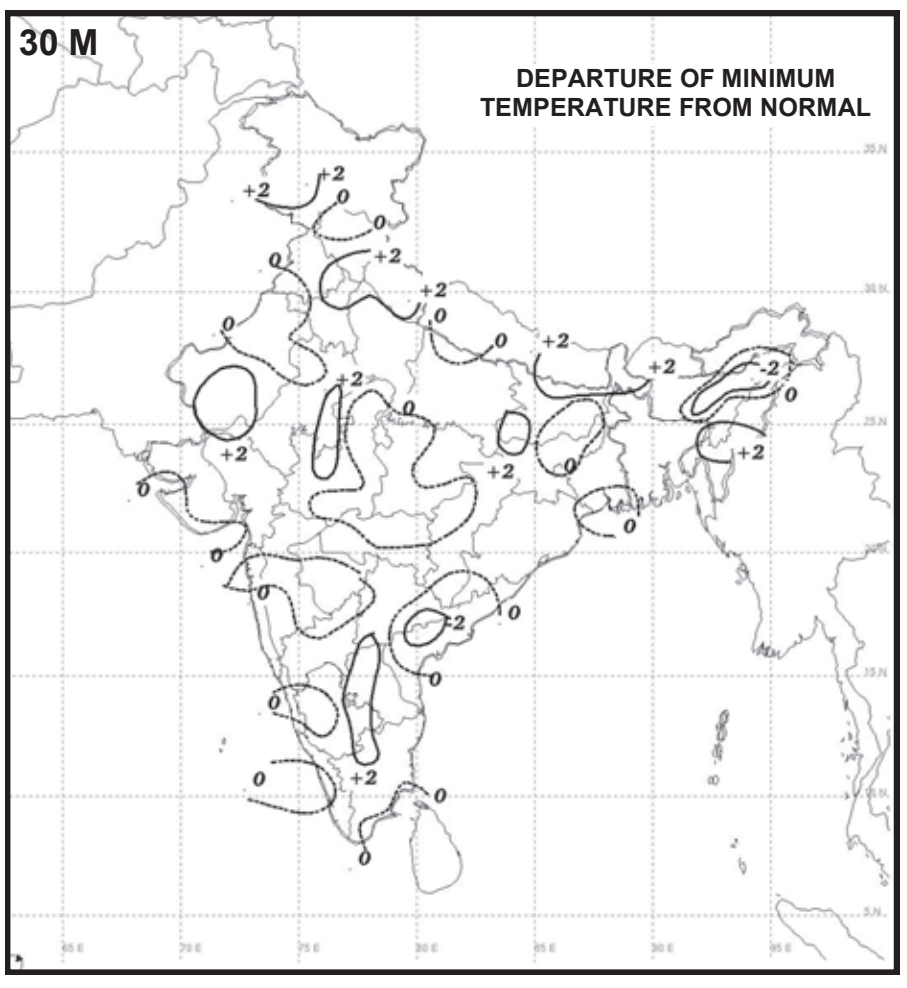
## WEATHER MAP AT 0830 hrs. I.S.T. (0300 hrs. U.T.C.)

### Wednesday, 30 August 2017 (08 Bhadrapada 1939 Saka)

**PLATE - 7**



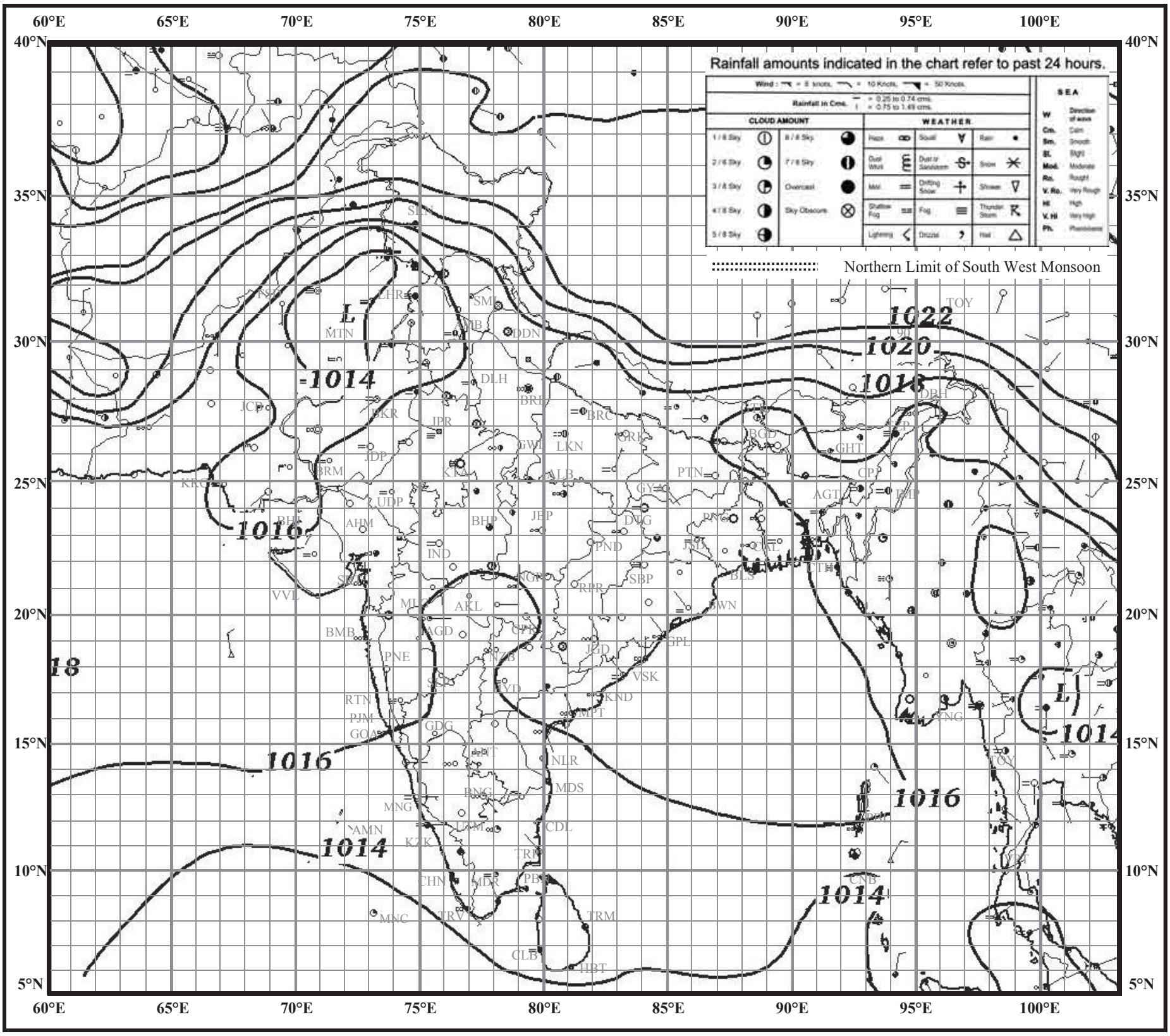



# INDIAN DAILY WEATHER REPORT

## WEATHER MAP AT 0830 hrs. I.S.T. (0300 hrs. U.T.C.)

### Tuesday, 12 December 2017 (21 Agrahayana 1939 Saka)

**PLATE - 8**



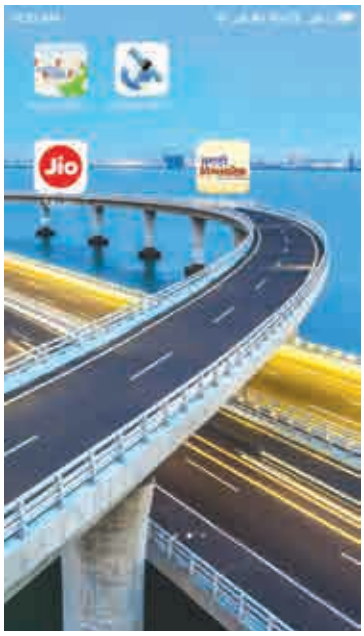


Fig. 11.2

2) After you click the icon of the App, following screen will appear. Let's see what each of these means. Follow the figure to understand the components shown on the screen. Fig. 11.3.

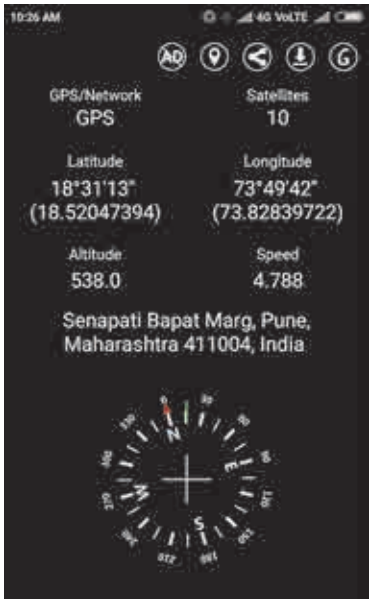



Fig. 11.3

(Note: Take reading only when 4 or more satellites are visible. At least 4 satellites are needed to work out your position accurately.)

3) Take a screenshot of the information.

4) Complete your observations here :

1) Number of coverage (visible) Satellites - .....
2) Absolute location - Latitude .....° .....' ....."and Longitude .....° .....' ....." .
3) Altitude of place from mean sea level (MSL) - ..... metres
4) Address or relative location - .....
5) Repeat the process for 2 more points not in the same location

**Learnings :**

Write a small paragraph on the learnings from this practical.

**PART II :** Measure area of a plot.

**STEP 1 -** Now install Gps Area Measurement and Calculator App from Google Play Store Following screen will appear. Fig. 11.4.


Fig. 11.4

**STEP 2 -** After you click the icon of the App, following screen will appear. Fig. 11.5.


Fig. 11.5

**STEP 3 -** Click on the icon 'Area'. Following screen will appear. Fig. 11.6.

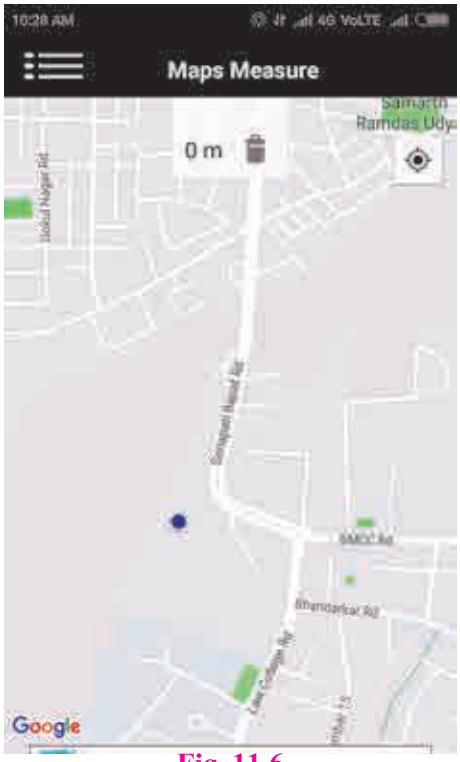



**Fig. 11.6**

**STEP 4 -** Click on the menu on the left and select Distance. This will help in measuring perimeter. For measuring area, click on Area. Following screen will appear. Fig. 11.7.

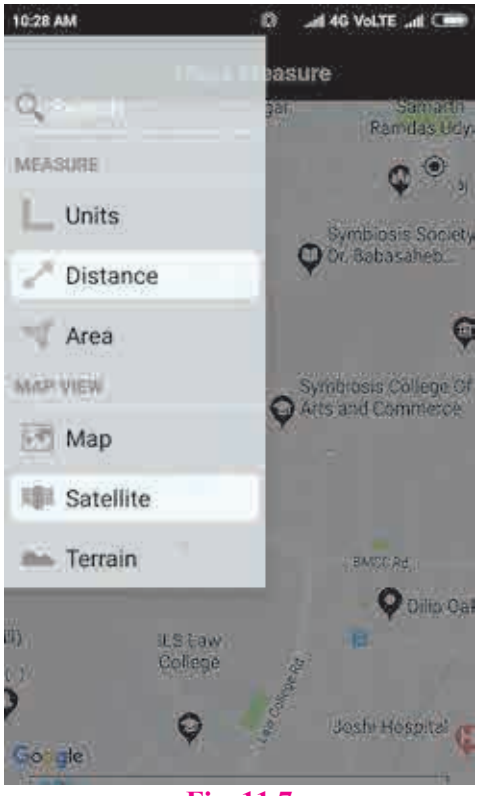



**Fig. 11.7**

**STEP 5 -** You can choose Terrain/Satellite option for viewing the area where you are.

**STEP 6 -** Now you can select the points to make a plot. Choose 3 or more points to measure the area of the plot. Teachers should make sure that the points are not close enough, atleast 25m away.

**STEP 7 -** Go to the first point and click on the blue point on the screen. This will be your first point. Fig. 11.8.


**Fig. 11.8**

**STEP 8 -** Go to other three points and repeat the process. Then come back to the first point. This will enclose your plot. Following screenshots will appear. Fig. 11.9 to 11.12. On the top of the screens, you can see the distance between points as you move forward. At the end, you get the perimeter of the plot. (Four points) . See the screenshot.

**STEP 9 -** Select Area from the menu and you will get the screen showing the area of your plot. Fig. 11.13. You will see the area as shown in fig 11.14.


Fig. 11.9

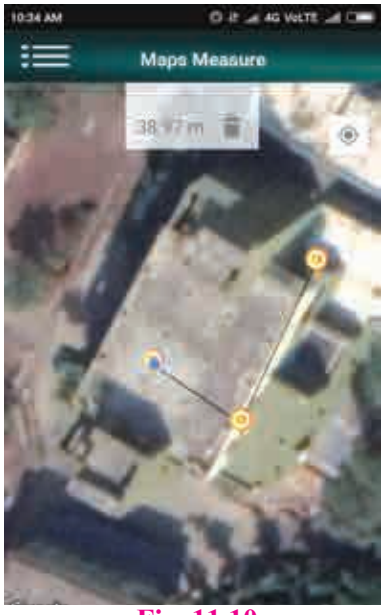



Fig. 11.10

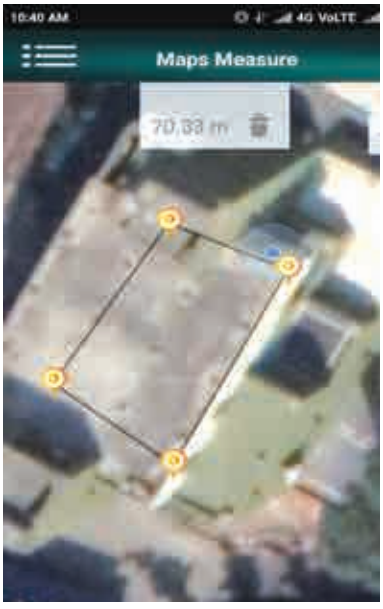



Fig. 11.11


Fig. 11.12

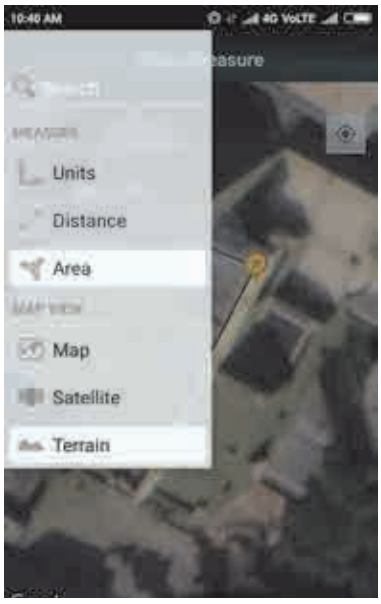



Fig. 11.13


Fig. 11.14

## Observations and conclusions :

Fill in the table as given below in your field book.

| Points | Distance from 1st point | Distance between two points |
|---|---|---|
| 1 | - | - |
| 2 | 27.45 m | 27.45 m |
| 3 | 38.97 m | 11.52 m |
| 4 | 57.93 m | 18.96 m |
| 5 | 70.33 m | 31.36 m |
| **Total perimeter -** | | 70.33 m |
| **Total Area** | | 289 $m^2$ |

## Further Suggestions for practicals :

1) Make a map of your school's play ground and measure area with the help of mobile GPS.
2) Measure the area of your farm with the help of mobile GPS.
3) Measure distance between your home and your school with the help of mobile GPS.

***

## Practical No. 12 - Soil profile

**Aim :** To examine the soil profile of a place

**Introduction :**

In this practical, you will learn how to describe a **soil profile**. A profile is a vertical slice of soil from a site. A profile description uses a precise vocabulary to describe the **soil horizons**, from the top to the unaltered **parent material**. In a horizon profile description, you identify and describe each distinct layer. A new layer is identified when there is a noticeable change in **soil color, texture** or **structure**. In this practical, you will describe each horizon in terms of the following characteristics: colour, horizon, texture and depth.

**Materials required :** Munsell chart (download and print), scale, tape, notepad, pen, pencil, camera

**Method :**

- Visit a quarry or any place where there is open soil available to observe the horizons. You can also dig a pit within the school/ college premises.
- Make a preliminary differentiation of the soil horizons based on color of each horizon using the Munsell color chart record in the Table below.
- Measure the depth from the surface to the top and bottom of each horizon.
- Record presence or absence of roots in each horizon
- Use the texture by 'feel method' to determine the soil texture of each horizon and record in the table.
- Make a sketch of the soil horizons to scale and indicate the variability in depth that you see across the face of the profile
- Describe the landscape/topography in which the soil pit is found
- Determine the parent material of this soil
- Click photographs to paste in your journals.

**Make a table showing the readings as follows in your fieldbook :**

| Horizon | Depth (in cm) | Color | Roots ( present/Absent) | Texture (coarse /soft) | Notes |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

**Observations and conclusions :**

## Practical No. 13 - Estimating the velocity of a river

**Aim :** To estimate the velocity of river

**Objectives :**

1) To understand the factors influencing the flow in the river.
2) To understand the effect of fluctuation in the flow on various bed forms in river channel.

**Materials required :** Stopwatch, piece of wood, metallic tape, whistle

**Method :**

- Select with the help of your teachers a stream in your locality which has straight course.
- Visit the site in the period when the flow is moderate. Ensure that there is some flow in the river
- On one bank of the river mark point A and measure a distance of 50m in downstream

direction of the flow.

- Measure 50 m distance and mark point B at the other end of the line.
- Two persons will be required to determine the velocity of the flow.
- The person at point A will hold the piece of wood and the whistle and stopwatch.
- He should throw the piece of wood in the flowing water and blow the whistle. Set the stop watch on.
- Person at point B will also have stop watch and the moment he hears the whistle, he starts the stopwatch keeping an eye on the stream. The piece of wood will flow in the downstream direction and the person at the point B and the moment he finds the piece of wood appearing in his frontline, he will stop the watch and blow the whistle.
- The time difference between the starting of the wood thrown and the wood sited at 50m distance is the time taken by the wood to cover the distance between A and B . Invariably, it is As wood is a floating load, it can be concluded that time taken by the wood is same as time taken by the water to cover the distance.
- Velocity of the river = Distance / time taken in seconds.

**Observations and conclusions :**

***

## Practical No. 14 - Determining location without the help of GPS

**Aim :** To Determine the geographical location of a place.

**Objectives :**

1) Understanding the relationship between specific celestial body and its position in the sky vis-a-vis location of the place
2) Understand the link between a longitude of a place and location of Standard Time Meridian in the region.
3) To estimate the geographical coordinates of a place without using any device

**Introduction :**

Generally, students or a layman find it difficult to know the location of a place with reference to geographical coordinates. Though geographical coordinate system depends on the imaginary lines assumed to be forming a graticule on the earth's surface, they are the only available system to know the coordinates of a place. As maps and other devices are available, one tends to forget their importance. Hence, it is necessary to make student understand how they can locate themselves on the planet.

At the same time, this method of locating yourself on the planet is very basic, simple and conventional. It uses the logic of defining the graticule. Explorers and travelers have used this method to locate themselves when the devices helping locating a place (like GPS or maps) were not available. This method is useful to locate a point in Northern Hemisphere. For Southern Hemisphere, a different method has to be used.

**Materials required :** A semi-circular protractor with a plumb- bob attached , paper pin, thread , a piece of stone , candle, a wrist watch and a stick of 5 feet length.

The method described below has two parts -one estimating the latitude and the other estimating the longitude.

**Procedure – to determine the latitude :**

**STEP 1 -** Take a semi-circular protractor available in your geometry box. You have to convert this protractor into a clinometer. (Instrument measuring an angle of slope)

**STEP 2 -** Take a paper pin and slightly heat it up with a candle. Be careful doing this so that you don't burn your fingers. Using the heated pin , make a small hole at the centre of the base of the protractor. Using a thread, a stone and make a plumb-bob , attach it to the protractor by inserting the thread through the hole you have made. Tie it properly. Hold the protractor with the base in your hand. The base will be at the top and the plumb will point the ground. You will realize the thread line will co-incide with the 90 0 mark.

**STEP 3 -** In the evening, wait for some time so that different stars will be visible in the sky. Locate the Pole Star under the guidance of your teacher or elderly persons with the help of either the Ursa Major ( Saptarishi- Group of seven major stars) or Cassiopeia ( Sharmishtha- group of five stars forming the letter W or M).Note that, you will definitely get either of the group of stars in the sky.

**STEP 4 -** Hold the protractor in your hand and look at the pole star along the line of the base of the protractor.Ask your friend to see the protractor and note the angle against the thread line. It will not be 90° as you saw in step 2. It will have some angle more than 90°. Find the difference between the observed angle and 90°. ($\phi - 90$) is the angle of elevation of the pole star above horizon. This is the angle of your latitude.

(Note: In Maharashtra, for any place the angle will be between 15° to 23°)

### Observations and learnings :

Note your observations. Write a note on your experience and observations.

## PART II

### Procedure – to determine the longitude :

To do this activity, use the time at least 20 min before the mid-day. At a given location, place the stick in the ground. See that it is vertically standing.

**STEP 1 -** Observe the length of its shadow from 11 a.m. onwards. (Refer to Geography Textbook for Standard 8, Chapter 1 for a detailed experiment). After every ten minutes, measure the length of the shadow. Continue doing this till the shadow length is at its minimum. Note the time in your wrist watch, when it is the shortest. What do you think will be the time when the shadow is the shortest? Will it be before 12 o clock or after 12 o clock in Maharashtra?

**STEP 2 -** Your wrist watch is adjusted to IST. So, the minimal length of the shadow will be before 12 o clock in your wrist watch. (In Maharashtra, the time of minimum shadow length will be before 12 noon in your wrist watch. If you are in West Bengal or Assam, the minimum length of the shadow will be after 12 noon in your wrist watch.) Find the difference in the time of minimal shadow length and 12 noon in the wrist watch.

**STEP 3 -** Divide the difference by 4 and that will be the difference between your longitude and the IST.

**STEP 4 -** Subtract /Add the value to IST ( 82° 30' E) and that is the longitude of your place.

### Observations and learnings :

Write a short note on your experience and observations. Find out the difference in the time between the minimum shadow length at easternmost and westernmost locations of Maharashtra.

***

# Practical No. 15 - Finding the slope of a road

**Aim :** To estimate the slope along a road.

**Objectives :**

1) To know why the roads are not always on flat surface
2) To know criteria for stability of a surface.

**Uses :**

1) Traffic safety and road construction.
2) Understanding mass movements.

**Materials required :** Ranging rods, foot scale, set squares (large size), activity to be carried out by 2 persons pieces of colored adhesive tape, measuring tape, scissors.

**Method :**

1) Select a stretch of road within your locality such that the points and the entire stretch of the road should be visible from both the points. Teachers should guide the students in selection of points in such a way that the rise is perceivable but not out of scope of observation.
2) One student can stand at the down slope end. He should stand with the ranging rod along the road. He should also hold the set square along the ranging rod. The set square should be such that the side of the set square will appear as the line of sight.
3) Another student will measure the height of the eyesight from the ground.
4) A student will stand with another ranging rod at point B. Before going to B , he will mark the point showing level of eyesight of the person at A on his ranging rod with a piece of coloured adhesive tape. The distance between A and B will be measured. From A, the student will look at the ranging rod at B. The person at point B will move his finger along the rod and person at A will ask him to stop at a point when his finger coincides with line of sight. He will mark that point by sticking a tape. Also, another student will measure the difference between the newly marked point and the line of sight marked earlier. Similarly, readings can be taken at points C, D, etc. Make sure you take at least 2 points after A.
5) Note the readings and fill the same in your field book in the following way.

| Points | Eyesight reading | Difference in height | Fall | Distance between successive points |
|---|---|---|---|---|
| A | 161 cm | | - | |
| B | 168 cm | +7 cm | - | 200 cm |
| C | 173 cm | +5 cm | - | 400 cm |
| **Total** | | | | 600 cm |

Similarly, rises / falls should also be added which will give us total rise along the road. Then the slope of the road will be

**Tan $\phi$ :** Total rise or drop / total distance between first point and last point.

**Note :** It is advisable during road surveys that the fall or rise should be measured in one and same direction.

***