551.524.3 (548.2)

# NUMERICAL PREDICTION OF DAILY MAXIMUM TEMPERATURE AT RAMAGUNDAM

1. It becomes uncomfortable when maximum temperature exceeds 40 deg. C in the industrial town of Ramagundam in Andhra Pradesh during summers between 15 April & 10 June. An attempt is made to predict the maximum temperature daily on the basis of past meteorological data so that the general public prone to sunstroke and other physical discomforts may be forewarned.

2. A simple method has been described in this note to forecast the maximum day temperature at Ramagundam based on two parameters only, viz., the dry bulb and dew point temperatures at 0830 IST of the day. Four different regression equations have been developed depending on the range of the dew point temperature at 0830 IST which provided an accuracy of within $\pm$ 1.5 deg. C on 80 per cent of the occasions.

3. The data for a period of 5 years from 1974 to 1978 has been used in this study. The four regression equations developed are as follows:

(i) When 0830 IST TdTd is $\geqslant 20°C$ :
$$T_{max} = 31.9856 + 0.2897\,T + 0.10438\,TdTd$$

(ii) When 0830 IST TdTd is $\geqslant 15°C$ but $< 20°C$:
$$T_{max} = 35.162 + 0.2924\,T - 0.1053\,TdTd$$

(iii) When 0830 IST TdTd is $< 15°C$ but $\geqslant 10°C$:
$$T_{max} = 32.7444 + 0.3064\,T + 0.04751\,TdTd$$

(iv) When 0830 IST TdTd is $< 10°C$ :
$$T_{max} = 14.40836 + 0.83252\,T + 0.09922\,TdTd$$

where $T_{max}$ is the predicted maximum temperature, $T$ is the dry bulb temperature at 0830 IST and TdTd is the dew point temperature at 0830 IST all in degrees Celsius. The actual and computed values for 1980 are shown in Table 1.

4. In actual computation of the maximum temperature values using the regression equations, it has been found that the error is more than $\pm 1.5$ deg. C on a few occasions. Such occasions are associated with local thunderstorms, low pressure areas and depressions causing rainfall at the station or in the neighbourhood. The above four regression equations are essentially useful in May and in June before the onset of monsoon.

The four equations were tested on the data for 1980. An accuracy of within $\pm 1°C$ was obtained on 60 per cent of the occasions and within $\pm 1.5°C$ was obtained on about 80 per cent of the occasions.

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## TABLE 1

The actual temperatures and forecast temperatures of Ramagundam for May and June

| Date | Max. temp. | | Date | Max. temp. | |
|---|---|---|---|---|---|
| | Actual | Computed | | Actual | Computed |
| **May 1980** | | | | | |
| 1 | 42.0 | 42.9 | 17 | 45.8 | 44.1 |
| 2 | 41.8 | 43.3 | 18 | 46.5 | 43.6 |
| 3 | 43.0 | 43.4 | 19 | 46.7 | 44.9 |
| 4 | 45.5 | 43.9 | 20 | 45.6 | 45.0 |
| 5 | 45.8 | 43.8 | 21 | 46.7 | 46.9 |
| 6 | 44.7 | 44.1 | 22 | 46.1 | 45.4 |
| 7 | 45.7 | 44.2 | 23 | 46.6 | 45.5 |
| 8 | 44.0 | 44.9 | 24 | 45.4 | 45.7 |
| 9 | 44.4 | 43.7 | 25 | 45.8 | 45.1 |
| 10 | 44.4 | 45.5 | 26 | 46.8 | 46.6 |
| 11 | 44.8 | 44.6 | 27 | 45.6 | 45.0 |
| 12 | 44.5 | 43.6 | 28 | 43.6 | 44.1 |
| 13 | 43.9 | 43.3 | 29 | 43.4 | 44.2 |
| 14 | 42.1 | 44.0 | 30 | 44.2 | 44.2 |
| 15 | 43.4 | 43.3 | 31 | 43.0 | 44.2 |
| 16 | 46.2 | 43.1 | | | |
| **June 1980** | | | | | |
| 1 | 42.8 | 44.1 | 9 | 44.0 | 44.5 |
| 2 | 43.7 | 44.0 | 10 | 39.8 | 42.9 |
| 3 | 45.6 | 44.5 | (Local thunderstorm) | | |
| 4 | 45.6 | 44.8 | 11 | 44.3 | 44.1 |
| 5 | 45.2 | 44.5 | 12 | 41.2 | 42.8 |
| 6 | 46.7 | 44.5 | 13 | 43.6 | 43.4 |
| 7 | 46.7 | 44.5 | 14 | 43.2 | 44.1 |
| 8 | 44.0 | 44.3 | 15 | 43.6 | 44.5 |