

**2018**

**M.Sc.**

**4th Semester Examination**

**APPLIED MATHEMATICS WITH OCEANOLOGY AND  
COMPUTER PROGRAMMING**

**PAPER—MTM-405 (Unit-II : OM)**

**Subject Code—21**

*(Practical)*

*Full Marks : 25*

*Time : 2 Hour*

*The figures in the right-hand margin indicate full marks.*

*Candidates are required to give their answers in their  
own words as far as practicable.*

*Illustrate the answers wherever necessary.*

*Answer any one question from each group.*

**Group—A**

7

1. Calculate the saturation vapor pressure near the science building taking a set of 5 data.

*(Turn Over)*

2. Calculate the vapor pressure near the science building taking a set of 5 data.
3. Find the dew point temperature by measuring dry bulb and wet bulb temperature near the science building taking a set of 5 data.
4. Calculate the wind speed and wind direction near the science building by taking a set of 5 data.
5. Find the mixing ratio of the air near the science building measuring of wet and dry bulb temperatures taking a set of 5 data.
6. Find the relative humidity near the science building taking a set of 5 data.

**Group—B**

4

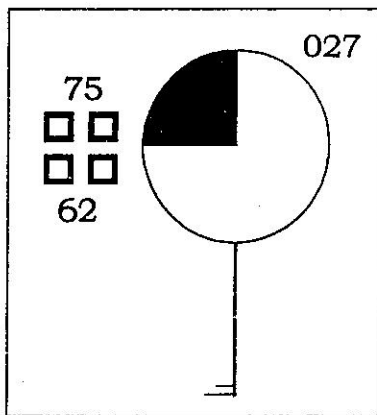
7. For the air parcel whose pressure is 60 kPa, temperature being  $20^{\circ}\text{C}$  and mixing ratio being 4 g/kg, find its dew point, saturation mixing ratio and relative humidity from thermodynamic diagram.
8. For the air parcel whose pressure is 80 kPa, temperature being  $20^{\circ}\text{C}$  and mixing ratio being 4 g/kg, using thermodynamic diagram, find its lifting condensation level, state of the air parcel when it reaches a pressure height of 40 kPa and how much liquid water has been condensed out at the height.

9. Determine the new state of the air parcel having initial temperature =  $30^{\circ}\text{C}$ , mixing ratio =  $5\text{ gm/kg}$  and pressure =  $100\text{ kPa}$  after being lifted dry adiabatically to the pressure level  $60\text{ kPa}$ .
10. For the air parcel whose pressure is  $70\text{ kPa}$ , temperature being  $20^{\circ}\text{C}$  and mixing ratio being  $4\text{ g/kg}$ , find its lifting condensation level, state of the air parcel when it reaches a pressure height of  $40\text{ kPa}$  and how much liquid water has been condensed out at that height?

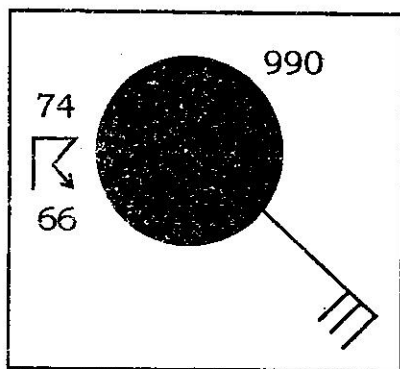
**Group—C**

4

11. Plot the following data around a surface station model when the atmosphere has the following : in present weather there is a thunderstorm, in past weather there was a light rain shower and the pressure tendency in last 3 hours is  $0.3\text{ mb}$ .
12. Interpret the following surface station model :



13. Plot the following data around a surface station model when the atmosphere have the following : Temp. 45°F, dewpoint 29°F, overcast, wind from SE at 15 knots, weather light rain, pressure 1004.5 mb.
14. Interpret the following surface station model :



**Note Book + Viva-Voce**

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**Field Work**

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