M.Sc. 4th Semester Examination, 2010

APPLIED MATHEMATICS WITH OCEANOLOGY AND COMPUTER PROGRAMMING

PAPER—MA-2212 (OM)

(Practical)

Full Marks : 25

Time : $1\frac{1}{2}$ hours

Answer any **one** question from each Group

The figures in the right-hand margin indicate marks

GROUP—A

1. Find the relative humidity near the science building taking a set of 5 data.   10

2. Calculate the saturation vapor pressure near the science building taking a set of 5 data.   10

3. Calculate the vapor pressure near the science building taking a set of 5 data. 10

4. Find the dew point temperature by measuring dry bulb and wet bulb temperature near the science building taking a set of 5 data. 10

5. Calculate the wind speed and wind direction near the science building taking a set of 5 data. 10

6. Find the mixing ratio of the air near the science building measuring of wet and dry bulb temperatures taking a set of 5 data. 10
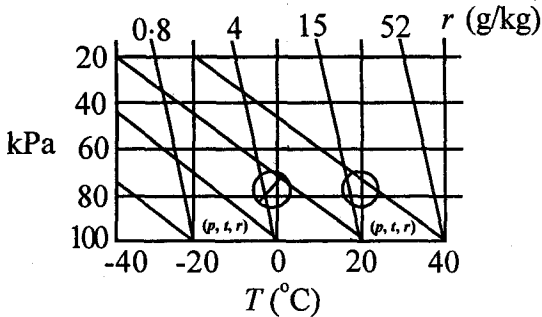
GROUP – B

7. From the following thermodynamic diagram, find the temperature, dew point, pressure, mixing ratio, saturation mixing ratio and relative humidity of an air parcel as marked in the figure. 5
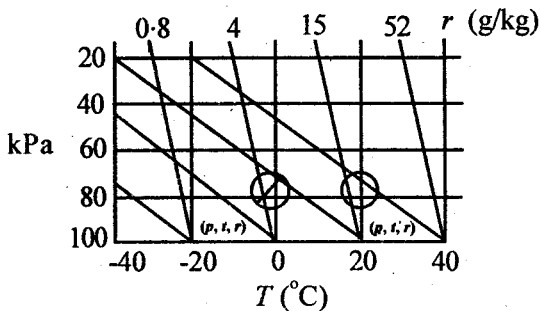
8. What is the new state of the air parcel as marked in the following thermodynamic diagram, being lifted dry adiabatically to $P = 60\,kPa$? 5

9. From the following thermodynamic diagram, find the LCL, and what is the state of the air parcel at that height? What is the state of the air parcel when it reaches a pressure height of 40 kPa? How much liquid water has been condensed out at that final height? 5
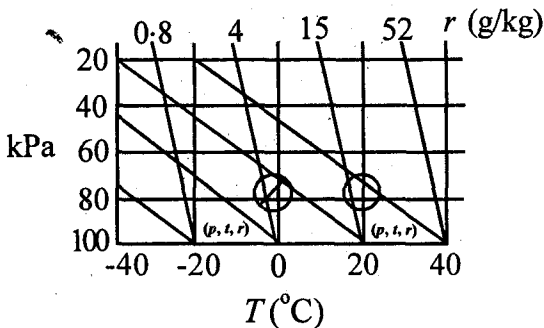
GROUP – C

10. Plot the following data around a surface station model when the atmosphere have the following : Temperature 45°F, dew point 29°F, overcast, wind from SE at 15 knots, weather light rain, pressure 1004.5 mb.   10

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 mb.   10

12. Interpret the following surface station model :   10