2019

MSc

4th Semester Examination

APPLIED MATHEMATICS WITH OCEANOLOGY AND COMPUTER PROGRAMMING

PAPER – MTM-405 Unit-II(OM)

Full Marks : 25

Time : 2 Hours

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: 1x20

Group-A

Q1:Calculate the saturation vapor pressure near the science building taking a set of 5 data.

Q2: Calculate the vapor pressure near the science building taking a set of 5 data.

Q3: Find the dew point temperature by measuring dry bulb and wet bulb temperature near the science building taking a set of 5 data.

Q4: Calculate the wind speed and wind direction near the science building taking a set of 5 data.

Q5: Find the mixing ratio of the air near the science building measuring of wet and dry bulb temperatures taking a set of 5 data.

Q6: Find the relative humidity near the science building taking a set of 5 data.

Group-B

Q7: Air initially at 100 kPa has temperature 40 ^{o}C and dew point temperature of 20 ^{o}C. It rises to a height where the pressure is 50 kPa. Precipitation reduces the total water by 5 gm/kg and the parcel radiatively cools by 11 ^{o}C while at cloud top. Finally, the parcel descends back to 100 kPa. What is the final relative humidity? (Using Tephigram)

Q8: Air initially at 98 kPa has temperature 30 ^{o}C and dew point temperature of 20 ^{o}C. It rises to a height where the pressure is 60 kPa. Precipitation reduces the total water by 8 gm/kg and the parcel radiatively cools by 11 ^{o}C while at cloud top. Finally, the parcel descends back to 100 kPa. What is the final relative humidity? (Using Tephigram)

Q9: Air initially at 90 kPa has temperature 45 ^{o}C and dew point temperature of 20 ^{o}C. It rises to a height where the pressure is 50 kPa. Precipitation reduces the total water by 3 gm/kg and the parcel radiatively cools by 10 ^{o}C while at cloud top. Finally, the parcel descends back to 100 kPa. What is the final relative humidity? (Using Tephigram)

Q10: Air initially at 100 kPa has temperature 30 ^{0}C and dew point temperature of 24 ^{0}C. It rises to a height where the pressure is 50 kPa. Precipitation reduces the total water by 6 gm/kg and the parcel radiatively cools by 8 ^{0}C while at cloud top. Finally, the parcel descends back to 100 kPa. What is the final relative humidity? (Using Tephigram)

Group-C

Q11: Plot the following data around a surface station model when the atmosphere have the Following: Temp 77 ^{0}F, dew point 68 ^{0}F, overcast, wind from ES at 25 knots, present weather light snow, pressure 999.8 mb. The pressure here has fallen 0.3 mb the last 3 hours.

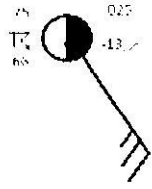
Q12:In the chart below you find meteorological data that was taken at several different cities in India. Use this data to create the station models for each city listed in the table.

City	Temp (°F)	Dew point	Wind		Air Pressure	Sky	Present Weather
			Direction	Speed			
Kharagpur	70	68	SW	25	998	75%	Fog
Egra	48	45	S	10	980	25%	snow
Contai	70	69	SW	15	1005	55%	clear
Haldia	75	72	W	30	999	overcast	thunderstorm

Q13: In the chart below you find meteorological data that was taken at several different cities in India. Use this data to create the station models for each city listed in the table.

City	Temp (°F)	Dew point	Wind		Air Pressure	Sky	Present Weather
			Direction	Speed			
Calcutta	69	60	NE	40	1007	50%	none
Burdwan	55	51	S	30	1005	overcast	snow
Durgapur	72	68	SW	20	1010	25%	drizzle
Malda	72	70	W	10	1011	100%	thunderstorm

Q14: Interpret the following surface station model:



Note Book + Viva	**5**
Field Work	**5**