Name: _____
Time of Class: _____
Due Date: _____

Regional Climatology

Lab Number Two (10pts)
Climatic Classification and Polar Climates

Part I: Group Discussion and Answer
Directions: Arrange a group of three individuals. Discuss each of the following questions. As a group, outline the answers to each question. The answers do not need to be in essay format, but they should be complete. Use bullet points, but fully answer the question. Each group should hand in only one answer sheet. Do not individually turn in the completed answers. You may omit one question.

1. What are the major characteristics of the ITC(Z)?

2. Draw a hypothetical continent that is bisected by the equator and contains little or no relief. On the continent, label and discuss the major climatic zones. Label: Af, Aw, BW, BS, Cf, Cs, Dw, Df warmer, Df colder, ET, EF, and high pressures.

3. What are the differences between genetic and empirical classifications?

4. Why are temperature and precipitation the two atmospheric elements most widely used as the sources of statistics for climatic classification? How are these two elements used in the Koppen system to identify five major climate categories? Identify the five major categories and identify the major characteristics of each.

5. What are the requisite conditions for the formation of hurricanes?

6. How does the Thornthwaite system of climate classification differ from the Koppen system? What are the advantages and disadvantages of the Thornthwaite system?

7. What is a climograph? What is its function?

8. It is amazing that any vegetation can live in the extremes presented by polar climates. What adaptive mechanisms enable plants to survive and persist in polar climates?

9. Discuss ET and EF climates. Be certain to consider: location, controlling factors and distinguishing characteristics.

10. Mountain ranges are often places of extreme. Paradise Ranger Station on the southwest slope of Mount Rainier averages more snow per year than any site in the U.S. What factors contribute to this high amount of snowfall?

Begin individual Answer session (each student will turn in their own work)
Part II: Terms and Concepts

1. Relative humidity

2. Potential Evapotranspiration

3. Microthermal

4. Treeline

5. Cfa

6. Soil moisture deficit

7. Hemicryptophytes

8. Climate of Greenland

PART III: Graphing -- Creating Climographs

Graphs visually displaying and simplify complicated data sets. They are an important tool within any discipline - especially geography. You will construct a special type of graph used by geographers and climatologist called a climograph. Climographs graphically illustrate monthly temperature and precipitation for a specific weather station. The variables of average monthly temperature and precipitation form the Y-axis and months of the year form the X-axis. Customarily, the temperature scale is located on the left Y-axis and the precipitation scale is on the right Y-axis. Average monthly precipitation is represented as bars extending from the bottom, and average monthly temperature is illustrated as a connected curved line in the upper portion of the graph.

1) Record the following information for each of the weather station locations:

Oneonta, New York
Lat: _____ Long: _____
Elevation: _____m_____ft
Population: _____
Average Annual Temp. _____
Average Annual Precip. _____

Baghdad, Iraq
Lat: _____ Long: _____
Elevation: _____m_____ft
Population: _____
Average Annual Temp. _____
Average Annual Precip. _____

2) On a separate sheet of paper construct two climographs. Graphically illustrate the temperature and precipitation data found in the Table 1 and Table II by creating a climograph. Creating a climograph is a matter of selecting the correct graph type. Your graphics package will query you for a graph type. Select the option for two axes. All word processing programs have graphing capabilities. Additionally, there are many graphics packages that could be employed to graph the data. Staple the graphs to the back of this lab. Your graphs must include: descriptive title, X-axis label, and Y-axes labels.

Table I: Temperature and Precipitation Data for Oneonta, New York

Average Monthly Temperature for Oneonta, New York

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
°C	-5.0	-5.1	0.4	6.7	13.0	17.9	20.5	19.2	15.5	9.5	3.3	-2.7	
°F	23.0	22.8	32.7	44.1	55.4	64.2	68.9	66.6	59.9	49.1	37.9	27.1	

Average Monthly Precipitation for Oneonta, New York

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
mm	62.9	60.1	74.8	77.8	86.4	100.3	102.0	101.1	89.7	81.7	76.4	69.0	
inches	2.5	2.4	2.9	3.1	3.4	3.9	4.0	4.0	3.5	3.2	3.0	2.7	

Table II: Temperature and Precipitation Data for Baghdad, Iraq

Average Monthly Temperature for Baghdad, Iraq

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
°C	9.4	11.8	16.2	21.6	27.7	32.3	34.6	34.2	30.8	24.9	17.2	11.1	
°F	48.9	53.2	61.2	70.9	81.9	90.1	94.3	93.6	87.4	76.8	63.0	52.0	

Average Monthly Precipitation for Baghdad, Iraq

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
mm	27.1	27.5	26.9	18.8	7.3	0.0	0.0	0.2	0.1	2.6	20.0	26.3	
inches	1.1	1.1	1.1	0.7	0.3	0.0	0.0	0.0	0.0	0.1	0.8	1.0	

Part IV: Short Answer and Diagramming

Directions: Concisely answer the following questions. Where appropriate, show all work.

1. Study the two climographs below. Provide as much detailed information about the climate of the two locations as you can. At a minimum, you should be able to list 4 major characteristics. Make an educated guess as to the location of each site.

Climograph I Climograph II

a) _____ _____

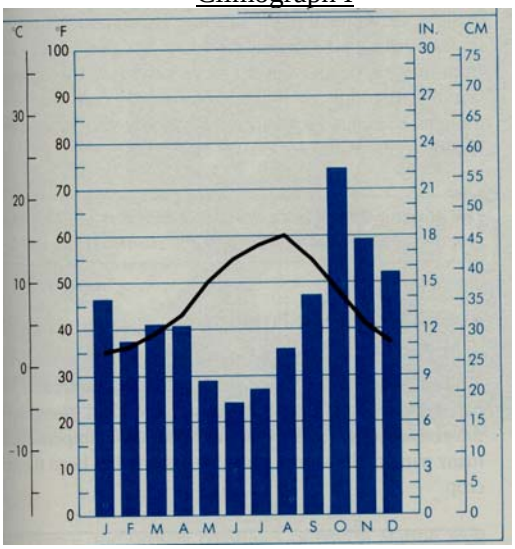
b) _____ _____

c) _____ _____

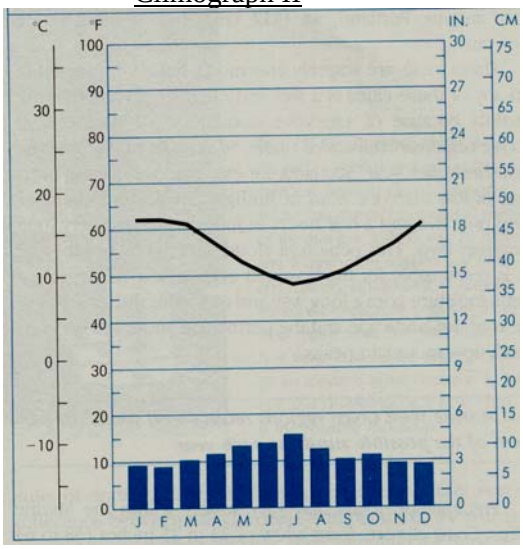
d) _____ _____

Location Climograph I _____ Location Climograph II _____

Climograph I



Climograph II



2. Study the Koppen Classification handout. Construct Koppen classification for the following:

   Snow climate with summer dry season and warm summers. _____

   Cold, arid desert regions. _____

   Tropical climate with a monsoon cycle. _____

3. Given these classification codes, describe the following areas and their potential location:

   Cfb: Location: _____

   Dfc Location: _____

   BSh Location: _____

4. Determine the Koppen climate for the following places (show all steps and work below):

   a) Singapore

b) Calcutta

c) Alice Springs

d) Vancouver

e) Rome Italy

Singapore 1°21'N, 104° E; 30 ft _____

78.8	80.6	80.6	82.4	82.4	82.4	80.6	80.6	80.6	80.6	78.8	78.8
11.22	6.46	6.01	6.30	5.16	6.97	6.42	7.87	4.80	7.24	9.29	12.05

Calcutta, India 23° S, 88° E; 19 ft _____

68.4	73.4	82.2	87.2	88.1	86.7	84.5	84.5	84.6	82.1	75.1	69.1
0.55	0.94	1.06	1.69	4.76	10.20	11.85	12.05	11.42	6.30	1.38	0.12

Alice Springs, Australia 24° S, 134° E; 1726 ft _____

82.6	81.5	76.4	67.6	59.6	54.2	52.9	57.8	64.7	73.1	77.9	81.4
1.74	1.32	1.09	0.39	0.60	0.52	0.29	0.31	0.28	0.71	1.15	1.53

Vancouver, British Columbia 49° N, 123° W; 2 ft _____

37.2	39.4	43.2	48.3	55.0	60.4	63.8	63.6	57.8	50.3	43.1	39.6
6.63	4.84	4.68	2.83	2.17	2.20	1.37	1.37	2.76	5.40	6.21	7.77

Rome, Italy 42° N, 13° E; 10 ft _____

45.1	47.1	51.6	57.8	64.9	72.6	77.5	77.1	71.7	62.8	53.7	47.5
2.97	2.67	1.63	1.73	1.87	1.23	0.38	0.87	2.28	3.82	3.55	3.11

6. The following exercise in climatic classification illustrates the importance of using averages.

Determine the Koppen Climate for the Year 1975 for Frostburg, Maryland. _____

Determine the Koppen Climate for the Year 1977 for Frostburg, Maryland. _____

Determine the Koppen Climate for the 30-year average for Frostburg, Maryland. _____

Which of the individual years represents the bigger departure from the normal? _____

Frostburg, Maryland 39° 39'N, 78° 56'W; 2035 ft **30-year average**

30.3	31.0	38.7	49.8	59.9	67.6	71.4	69.8	64.1	53.7	41.8	31.9
3.30	2.64	3.78	3.73	4.10	4.64	3.77	4.11	3.19	3.22	2.56	2.89

1975 Data

35.7	35.3	40.5	48.4	65.7	70.3	73.8	74.8	62.6	58.5	49.7	33.5
3.31	2.31	4.24	4.70	6.48	4.03	3.88	4.77	6.42	4.58	1.26	2.12

1977 Data

12.1	26.3	40.6	50.0	60.9	66.9	70.6	68.2	62.5	47.7	40.4	26.2
2.91	1.92	4.90	3.37	1.91	2.81	2.30	4.24	2.04	4.14	6.57	2.35