FORM A

GEOGRAPHY 1114   NAME_____
LABORATORY EXAM 1
Spring 2011   TEACHING ASSISTANT _____

50 Points possible   LAB TIME/DAY_____
2 points per question

CHOOSE THE BEST ANSWER—IT SHOULD BE BEST BY FAR

ANSWER ALL QUESTIONS IN PENCIL ON THE SCANTRON SHEET

YOU MAY MAKE CALCULATIONS ON THIS QUESTION FORM

> ## FORMULAS
> DD = Degrees + $\dfrac{minutes}{60}$ + $\dfrac{seconds}{3600}$
>
> RF = map distance: actual distance
> 1 mile = 62,500 inches
> 1 kilometer = 1,000 meters
> 1 kilometer = 100,000 centimeters
> RH = (mixing ratio ÷ saturation mixing ratio) x 100%
> Dry adiabatic lapse rate = 10°C per kilometer
> Moist adiabatic lapse rate = 6°C per kilometer

1) What is the dew point?
A. The mass of water vapor that air can hold at a particular air temperature
B. Water vapor in the atmosphere
C. Another name for the saturation mixing ratio
D. ♦The temperature at which air becomes saturated
E. The altitude at which dew forms

2) If the relative humidity is 40% and the saturation mixing ratio is 5.0 grams per kilogram, what is the mixing ratio?
A. 1.5 grams per kilogram
B. ♦2.0 grams per kilogram
C. 7.0 grams per kilogram
D. 26.8 grams per kilogram
E. Not enough information given.

FORM A

3) Why is it recommended to trilaterate from as many satellites as possible while using GPS?
A. It increases amplifies the satellite signal
B. ♦It improves the positional (spatial) accuracy
C. GPS units don't work without seven satellites
D. Some satellites are usually inoperable
E. We are trying to fool you; it is not recommended

4) While measuring latitudes and longitudes, which of the following system of units is used with GPS?
A. Degree Minutes Seconds (DMS)
B. Nautical Miles (NM)
C. ♦Decimal Degrees (DD)
D. Metric System (SI)
E. None of the above

5) A map of Chicago, Illinois has a representative fraction of 1:125,000. If you measured a map distance of 2 inches between railways, how far would the railways be in actual earth distance?
A. 2 miles
B. ♦4 miles
C. 6 miles
D. 8 miles
E. 12 miles

6) In most of Oklahoma, the line which runs north-south and from which all land is surveyed is the
A. base line
B. ♦Indian Meridian
C. principal range
D. Equator
E. Prime Meridian

7) An example of a small-scale map would be
A. a map of the OSU campus
B. a map of the parking areas surrounding Boone Pickens stadium
C. the Stillwater South 1:24,000 USGS topographic map
D. a map of the eastern half of Payne County
E. ♦a map of Africa
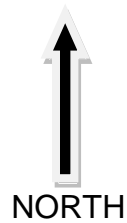
8) Convert 25° 20' 0" from Degrees, Minutes, Seconds (DMS) to Decimal Degrees (DD).
A. ♦25. 3333
B. 25. 6666
C. 25. 0033
D. 25. 2525
E. none of the above

9) According to the numbering scheme of the U.S. Public Land Survey System what is the location of quadrant C?

Section 10, T 18 N, R 2 E

D		F	
E		A	B
		C	

NORTH

A. NE ¼, SE ¼, Section 10
B. NW ¼, SE ¼, Section 10
C. NE ¼, NW ¼, Section 10
D. ♦SW ¼, SE ¼, Section 10
E. SE ¼ , SW ¼ Section 10
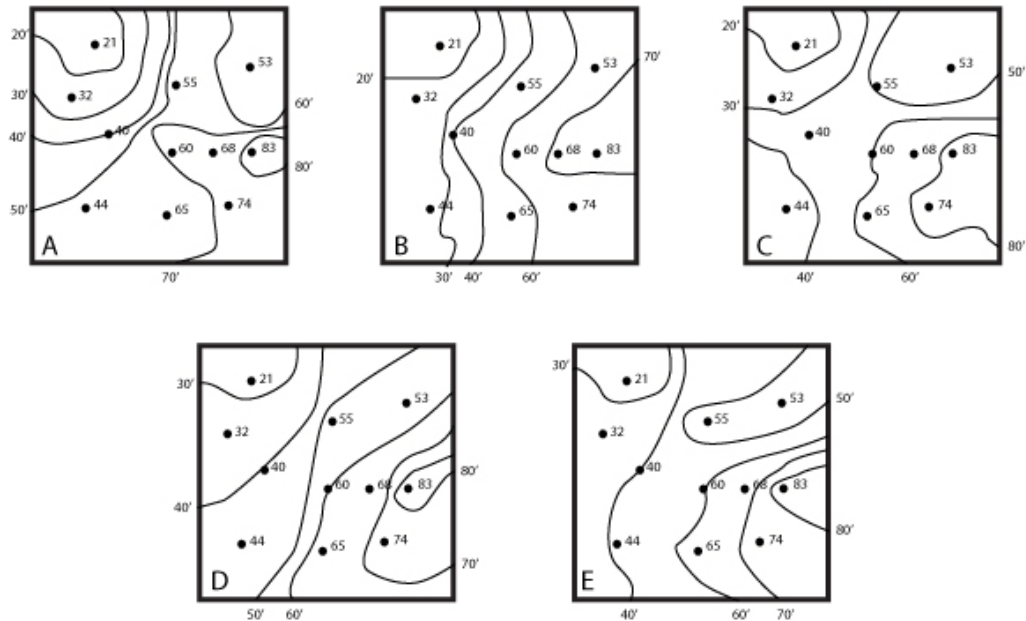
10) By international agreement there are 24 standard time zones each covering _____ degrees of longitude.
A. 5
B. 10
C. ♦15
D. 20
E. 24

FORM A

11) Which map has every required contour line correctly displayed? Altitudes are given in feet and the contour interval is 10 feet.
A. A
B. B
C. C
D.◆ D
E. E

12) When forecasting weather using upper air and surface air maps, if is usual to assume that SURFACE weather map features will move at about which of the following rates of flow compared to the 500 millibar level (about 18,000') flow?
A. 20%

B. ◆50%

C. 75%

D. 100%
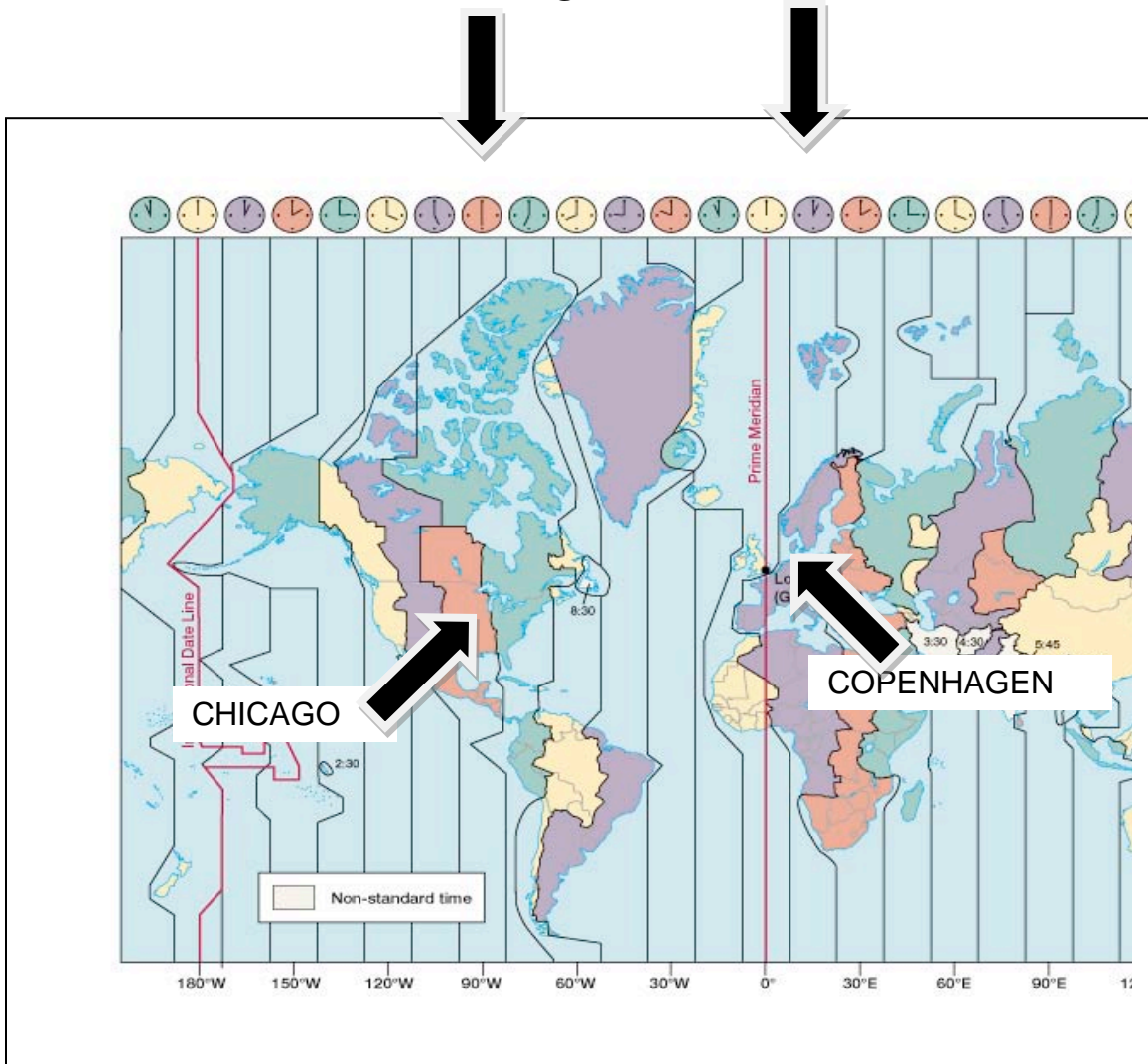
E. 150%

13) _____ bisects the Earth; the Equator is an example.
A. Each line of latitude
B. The plane of Arctic Circle
C. The plane of Tropic of Capricorn
D. Earth's axis
E. ◆The plane of a great circle

FORM A

14) Using the time zone map, if you catch a flight from Chicago's O'Hare Airport at 12 noon and endure an eight hour flight, what time will it be when you land in Copenhagen, Denmark?

A. 8 p.m.

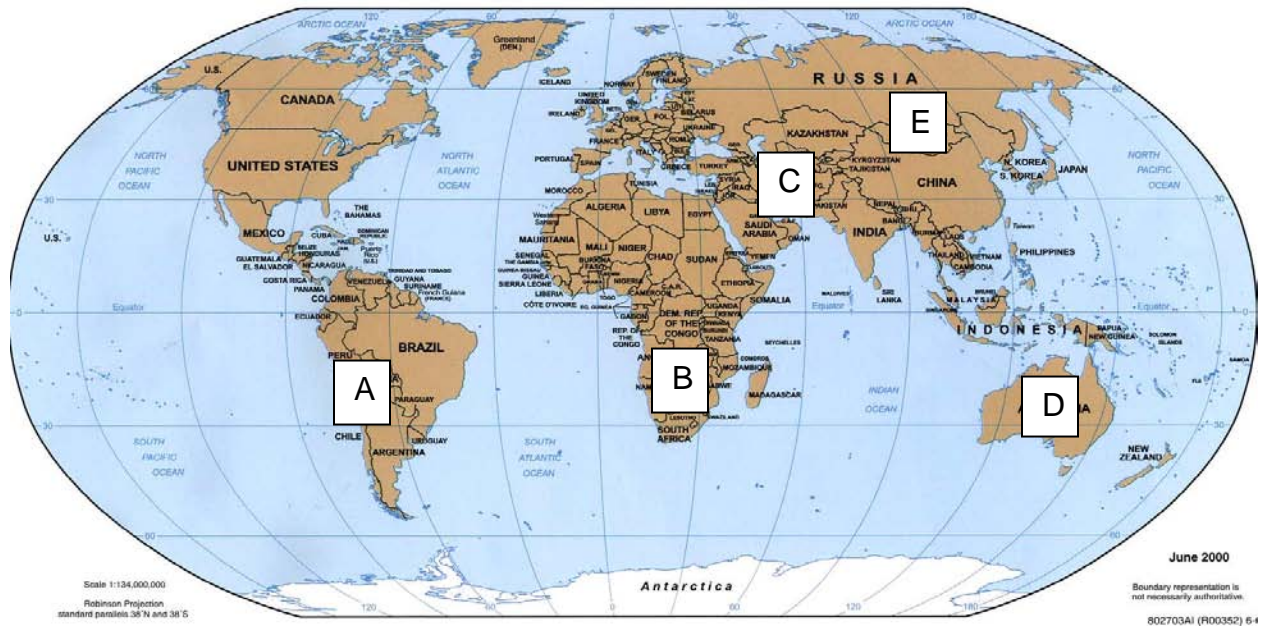B. ♦3 a.m.

C. midnight

D. 3 p.m.

E. 8 a.m.

TIME ZONE MAP

CHICAGO

COPENHAGEN

Non-standard time

180°W   150°W   120°W   90°W   60°W   30°W   0°   30°E   60°E   90°E

FORM A

15) On the World Map, which letter best represents the location of the Gobi Desert?
A. A
B. B
C. C
D. D
E. ♦E.

WORLD MAP

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16) The hand-held device used in lab is known as the _____ component in the GPS system?
A. orbit
B. control
C. ♦user
D. trilateration
E. Space

17) Radio transmission echoes reflecting off of buildings, mountains, and weather cause inaccuracy in GPS work are known as _____?
A. waypoints
B. scale factors
C. ♦multipath errors
D. false benchmarks
E. area calculations

FORM A

18) A(n) _____ is a location stored in a GPS receiver
A. area calculation
B. ◆waypoint
C. section
D. control
E. representation fraction

19) If the air outside is 30° C, the mixing ratio is 14.0 g/kg, and the saturation mixing ratio is 28.0 g/kg, what is the relative humidity in percent?
A. 25%
B. ◆50%
C. 75%
D. 100%
E. 200%

20) What is the surface pressure in millibars shown on this weather station model?
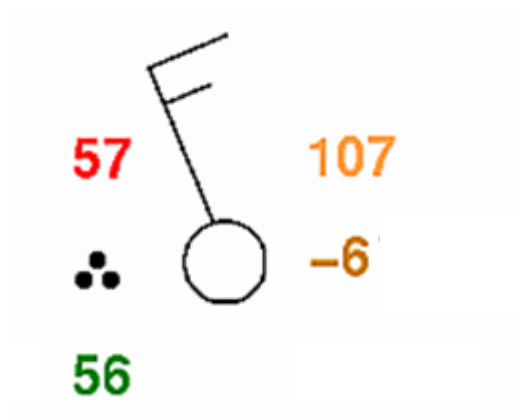
A. 57
B. 56
C. 107
D. 910.7
E. ◆1010.7

FORM A

21) On the stability chart, the air at 1.5 km is

A. unstable because the adiabatic temperature is cooler than the environmental temperature.

B. stable because the adiabatic temperature is cooler than the environmental temperature.

C. ◆ unstable because the environmental temperature is cooler than the adiabatic temperature.

D. stable because the environmental temperature is cooler than the adiabatic temperature.

E. The answer cannot be determined with the information given.

STABILITY CHART
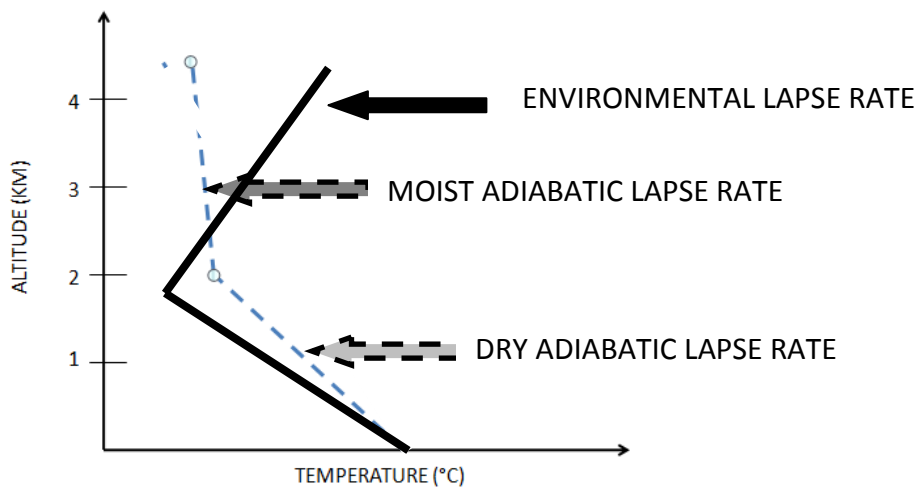
22. Which of the following is the proper name for the **graphs** used to show using monthly temperature and precipitation data? See questions about Iquitos and Wadi Haifa.

A. Climate Classification Chart
B. ◆ Climograph
C. Climate map
D. Climo-chart
E. Köppen Climate Classification

23) On diagram of air flowing over the mountain, unsaturated air rises from 500m (at A) to become saturated at 2,000m (at B). The air continues to rise saturated until the mountain top at 3,500m (at C). Unsaturated, the air sinks back to 500m (at D). What is the temperature at D if the initial temperature of the air is 10°C at A?
A. 10°
B. -8°
C. ♦16°
D. 22°
E. Need more information

AIR FLOWING OVER THE MOUNTAIN
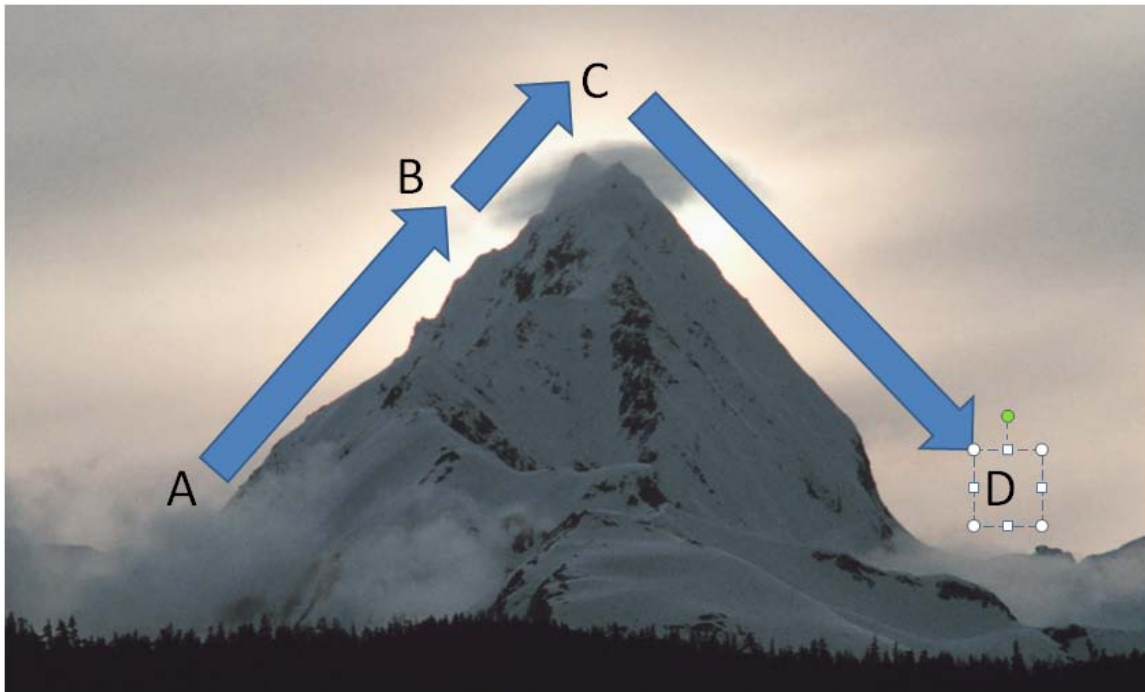
24. Classify the Waidi Haifa, Sudan data into the proper Köppen climate type using the charts at the end of the exam.
A. Am
B. ♦BWh
C. BSk
D. Dfd
E. ET

FORM A

WADI HAIFA, SUDAN
22°N, 31°E, 160M

MEAN TEMPERATURE 26°C

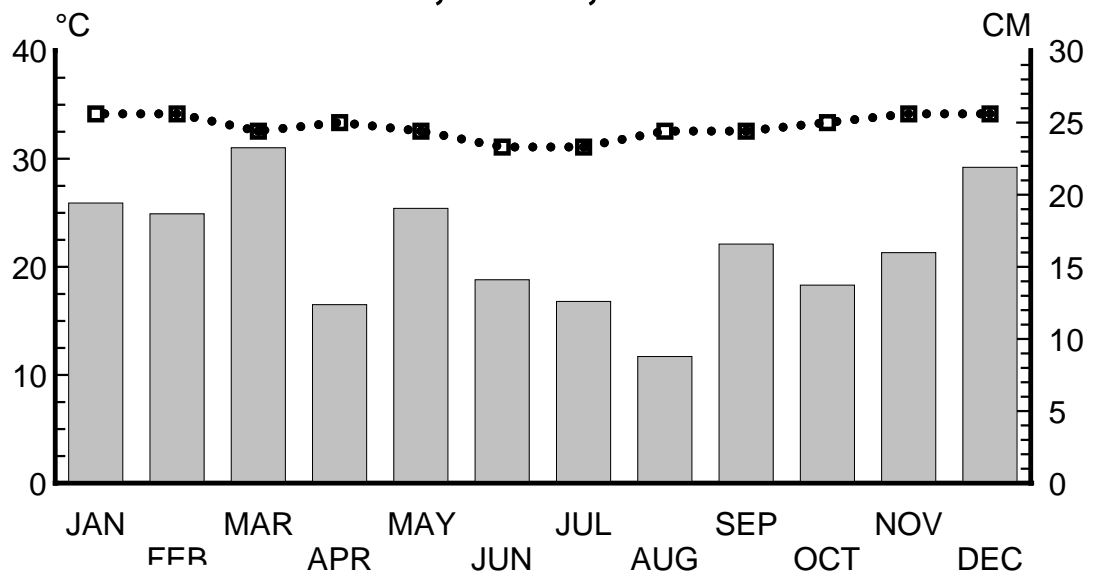MEAN PRECIPITATION 0.3 CM

EVAPORATION IS GREATER
THAN PRECIPITATION
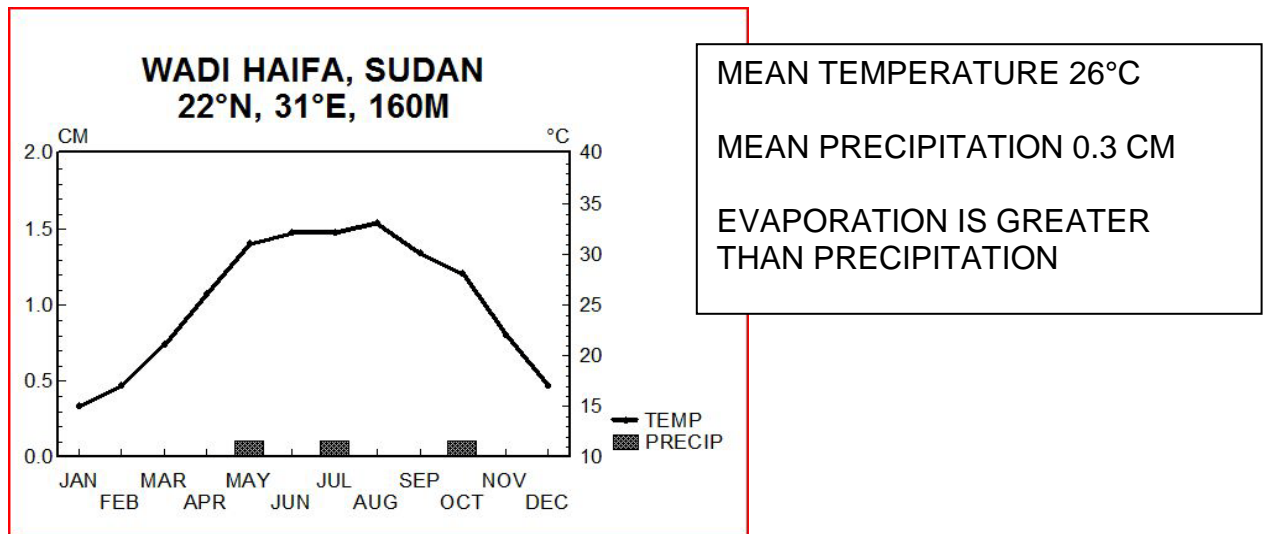
25. Classify the Iquitos, Peru data into the proper Köppen climate type using the charts at the end of the exam.
A. ♦ Af
B. BSh
C. Csa
D. Dwc
E. EF

IQUITOS, PERU
3°S, 73°W, 115M

PRECIPITARTION IS GREATER THAN EVAPOTRANSPIRATION

YEAR: 24.7°C, 261.9 CM

FORM A

KOPPEN CLIMATE CHARTS

FIRST LETTERS	DERIVATION	DESCRIPTION
A	Alphabetical	average monthly temperature above 18°C
B	Alphabetical	evaporation exceeds precipitation
C	Alphabetical	average temperature 18°C and –3°C in coldest month, above 10°C in warmest month
D	Alphabetical	average monthly temperature of warmest month above 10°C; coldest month below –3°C
E	Alphabetical	no month with average temperature above 10°C
H	Highland	significant climatic changes in short horizontal distances due to altitudinal variations
SECOND LETTERS		
f	German "feucht", moist	In A climates rains all year, average monthly rainfall at least 6 cm; in other climates, nopronounced dry season
F	Frost	no month with average temperature above 0°C
m	Monsoon	only 1-3 months with average rainfall below 6 cm
s	Summer dry	driest summer month has below 1/3 the average precipitation of wettest winter month
S	Steppe, semiarid	average annual precipitation between 38 cm and 76 cm in low latitudes, 25 cm to 64 cm in midlatitudes; no pronounced seasonal concentration
T	Tundra	at least 1 month with average temperature between 0° and 10°C
w	Winter dry	In A climates, 3-6 months with average rainfall below 6 cm; in C and D climates, driest winter month has less than 1/10 the average rainfall of wettest summer month
W	German "Wuste", desert	average annual precipitation generally below 38 cm in low latitudes, and below 25 cm in midlatitudes
third letters		
a	Alphabetical	average temperature of warmest month above 22°C
b	Alphabetical	average temperature of warmest month below 22°C; at least 4 months with average temperature above 10°C
c	Alphabetical	average temperature of warmest month below 22°C; fewer than 4 months with average temperature above 10°C; coldest month above --38°C
d	Alphabetical	average temperature of coldest month below -38°C
h	German "heiss", hot	average annual temperature above 18°C
k	German "kalt", cold	average annual temperature below 18°C

FORM A

Zone	Code	Type	Description
A	Af	Tropical wet	no dry season
	Am	Tropical monsoonal	monsoonal; short dry season with heavy rains in other months
	Aw	Tropical savanna	dry season in winter (low-sun season)
B	BWh	Subtropical desert	low-latitude true desert
	BSh	Subtropical steppe	low-latitude dry
	BWk	Midlatitude desert	midlatitude true desert
	BSk	Midlatitude steppe	midlatitude dry
C	Csa	Mediterranean	mild midlatitude with dry, hot summer
	Csb	Mediterranean	mild midlatitude with dry, warm summer
	Cfa	Humid subtropical	mild midlatitude with no dry season and hot summer
	Cwa	Humid subtropical	mild midlatitude with dry winter and hot summer
	Cfb	Marine west coast	mild midlatitude with no dry season and warm summer
	Cfc	Marine west coast	mild midlatitude with no dry season and cool summer
D	Dfa	Humid continental	humid midlatitude with severe winter, no dry season and hot summer
	Dfb	Humid continental	humid midlatitude with severe winter, no dry season and warm summer
	Dwa	Humid continental	humid midlatitude with severe winter, dry winter and hot summer
	Dwb	Humid continental	humid midlatitude with severe, dry winter and warm summer
	Dfc	Subarctic	humid midlatitude with severe winter, no dry season and cool summer
	Dfd	Subarctic	humid midlatitude with severe, very cold winter and no dry season
	Dwc	Subarctic	humid midlatitude with severe, dry winter, and cool summer
	Dwd	Subarctic	humid midlatitude with severe, dry, very cold winter
E	ET	Tundra	polar tundra with no true summer
	EF	Ice cap	polar ice cap
H	H	Highland	highland