Each multiple choice question is worth 5 points.

1. A polling company conducted a survey of voters to obtain data for a political campaign. They selected 3500 voters randomly from the 168,000 names on the voter registration lists of the county and found that 1372 intended to vote for candidate Doe. Which of the following questions is/are true?

   I. The population is the 3500 voters chosen.
   II. The population is all voters on the voter registration lists of the county.
   III. The sample is the 1372 voters who intended to vote for candidate Doe.
   IV. The sample is the 3500 voters chosen.

   a. I and III are true.
   b. I and IV are true.
   c. II and IV are true.
   d. II and III are true.

2. Use the table of random digits to choose five people from a list numbered 001 to 225. Start at row 4.

01033	08705	42934	79257	89138	21506	26797
49105	00755	39242	50772	44036	54518	56865
61589	35486	59500	20060	89769	54870	75586
08900	87788	73717	19287	69954	45917	80026
75029	51052	25648	02523	84300	83093	39852
91276	88988	12439	73741	30492	19280	41255
74008	72750	70742	67769	72837	27098	07049
98406	27011	76385	15212	03806	85928	76385

   a. 008, 025, 083, 105, 192
   b. 010, 050, 075, 089, 200
   c. 010, 020, 036, 077, 185
   d. 008, 041, 052, 089, 192

Use the following information for questions 3 and 4.

Dave's log of favorite hikes contains information about Mirror Lake; specifically the distance of the hike (6.5 miles), its difficulty level (Moderate), the change in elevation (3000 feet), the time to hike (3 hours), and the last year hiked (2005).

3. Which is the highest level of measurement for difficulty level?

a. nominal
b. ordinal
c. interval
d. ratio

4. Which is the highest level of measurement for distance of the hike?

a. nominal
b. ordinal
c. interval
d. ratio

5. Which of the following statements is/are true?

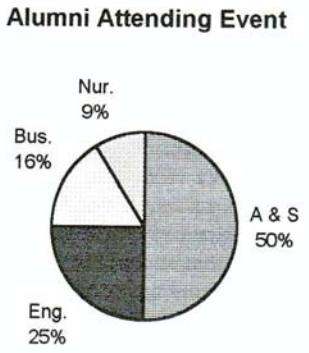
I. Individuals are the characteristics to be measured or observed.
II. A quantitative variable has a value or numerical measurement for which operations such as addition and averaging make sense.
III. Inferential statistics involves methods of using information from a sample to draw conclusions regarding the population.

a. Only II is true.
b. Only I and II are true.
c. Only II and III are true.
d. All are true.
e. None are true.

6. Suppose a survey was conducted and respondents were asked to name their favorite type of music: classical, jazz, rock, rhythm and blues, or rap. Which of the following would be the best tool to display the results?

a. bar graph
b. frequency histogram
c. stem and leaf display
d. relative frequency histogram
e. box-and-whisker plot

7. The following circle graph gives information about attendance at a recent alumni event.



Which of the following tables corresponds to the circle graph?

a.

School	Number
Arts and Science	195
Engineering	98
Business	94
Nursing	47

c.

School	Number
Arts and Science	238
Engineering	119
Business	51
Nursing	26

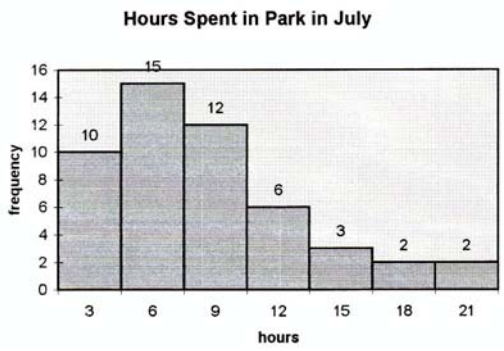
b.

School	Number
Arts and Science	217
Engineering	109
Business	70
Nursing	38

d.

School	Number
Arts and Science	260
Engineering	130
Business	29
Nursing	15

8. The district manager of a suburban park and recreation area wants to estimate the amount of time people spend in their local park in July. A random sample of local residents gave the following information. How many people were in the sample?



a. 15

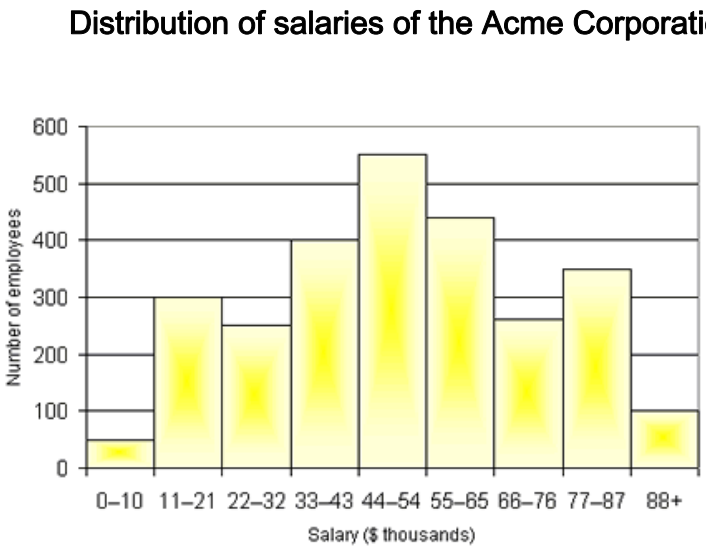
b. 24

c. 21

d. 50

e. 18

9. Which term **best** describes the histogram below?



a. skewed left

b. bimodal

c. uniform

d. symmetrical

e. Pareto

10. Orthopedists indicate that about 26% of their cases involve knee problems and more than two-thirds of their knee procedures involve total knee replacements. The ages of adults getting knee replacements are indicated in the following frequency table. [Note n = 200 patients].

Age	29-38	39-48	49-58	59-68	69-78	79-88
Number	10	40	35	45	60	10

Determine the mean and standard deviation for the age of people receiving total knee replacements.

a. mean is 33.33
standard deviation is 19.92

b. mean is 60.25
standard deviation is 13.52

c. mean is 58.5
standard deviation is 18.71

d. mean is 63.5
standard deviation is 12.25

e. None of the preceding

11. At the branch of the Bank of South Australia located on the campus of Adelaide University there are twelve employees. The list of employees with their annual salary (in thousands of Australian dollars) are listed below:

Branch Manager: 40
Assistant Manager: 35
Tellers: 18, 25, 19, 18, 21, 17, 18, 20
Secretaries: 16, 15

If the teller who earns 19 thousand is promoted and receives a new salary of 21 thousand, how will the mean, median and mode be changed?

a. All will remain the same.

b. Only the mean will change.

c. The mean and median will change. The mode will remain the same.

d. All will change.

e. The mean and mode will change. The median will remain the same.

12. The first year students on one floor of Crawford Hall were polled to determine how often they phoned home during the first 8 weeks of the Fall Semester. The results are given below in a stem and leaf display. Determine the median and modal phone calls.

THE NUMBER OF PHONE CALLS HOME

0	1 1 2 3 4 4
0	5 6 6 6 6 6 8 8 8 9 9
1	0 2 2 2 2 3 3 4
1	5 6 6 7 8 8
2	0 1 4
2	5 8

a. median is 11 mode is 6

b. median is 10 mode is 6

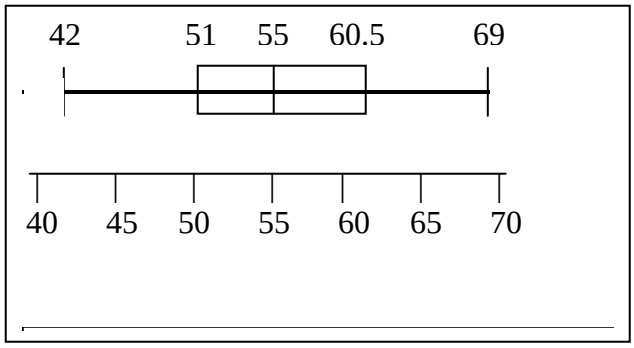
c. median is 12 mode is 6

d. median is 6 mode is 11

e. median is 11 mode is 9

Use the following information for questions 13 and 14.

13. For the box-and-whisker plot below, which of the following statement(s) is(are) true?



I. The mean of the data is 55.
II. Approximately 25 % of the data lie above 60.5.
III. Approximately 50% of the data are between 51 and 55.

a. All the statements are true.

b. Only II is true

c. Only I is true

d. Only I and II are true.

e. Only II and III are true.

14. Use the box-and-whisker plot in question 13 to determine the **interquartile range.**

a. 30 b. 35 c. 27 d. 9.5

Name: _____ Section: _____

Instructor: _____

15. Identify the type of sampling (cluster, convenience, random, stratified or systematic) which could be used to get each of the following samples. (10 points)

a. For a period of two days measure the length of time each fifth person coming into a bank waits for teller service.

b. Take a random sample of five zip codes from the New York metropolitan region and count the number of students enrolled in the first grade for every school in each of the zip code areas.

c. Divide the users of the internet into different age groups and select a random sample from each age group. Survey the people in the sample about the amount of time they spend on the internet each month.

d. Survey five friends regarding their opinion about the quality of the food in the Trabant Center.

e. Use a table of random numbers to select a sample of students enrolled at UD and ask them how much financial aid they receive each year.

16. Nurses on the eighth floor of community Hospital believe they need extra staffing at night. To estimate the night workload a random sample of 35 nights was used. For each night, the total number of patient room calls to the nurses' station on the eighth floor was recorded as follows. (10 points)

64	60	69	70	83	58	90	86	71	71	92	70
95	70	74	46	18	84	82	75	63	101	77	87
102	80	86	85	73	86	62	100	90	37	88	

Construct a histogram that contains 5 classes. The class width is _____.

17. Nurses on the eighth floor of community Hospital believe they need extra staffing at night. To estimate the night workload a random sample of 35 nights was used. For each night, the total number of patient room calls to the nurses' station on the eighth floor was recorded as follows.

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Use the data to make a **box-and-whisker plot.** (10 points)

Multiple Choice Key
M114 Exam 1

1. C
2. D
3. B
4. D
5. C
6. A
7. B
8. D
9. D
10. B
11. C
12. A
13. B
14. D

Name: _____ **Section:** _____

Instructor: _____

15. Identify the type of sampling (cluster, convenience, random, stratified or systematic) which could be used to get each of the following samples. (10 points)

a. For a period of two days measure the length of time each fifth person coming into a bank waits for teller service.

Systematic

b. Take a random sample of five zip codes from the New York metropolitan region and count the number of students enrolled in the first grade for every school in each of the zip code areas.

Cluster

c. Divide the users of the internet into different age groups and select a random sample from each age group. Survey the people in the sample about the amount of time they spend on the internet each month.

Stratified

d. Survey five friends regarding their opinion about the quality of the food in the Trabant Center.

Convenience

e. Use a table of random numbers to select a sample of students enrolled at UD and ask them how much financial aid they receive each year.

Random

16. Nurses on the eighth floor of community Hospital believe they need extra staffing at night. To estimate the night workload a random sample of 35 nights was used. For each night, the total number of patient room calls to the nurses' station on the eighth floor was recorded as follows. (10 points)

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95	70	74	46	18	84	82	75	63	101	77	87
102	80	86	85	73	86	62	100	90	37	88	

Construct a histogram that contains 5 classes. The class width is 17.

Low = 18

High = 102

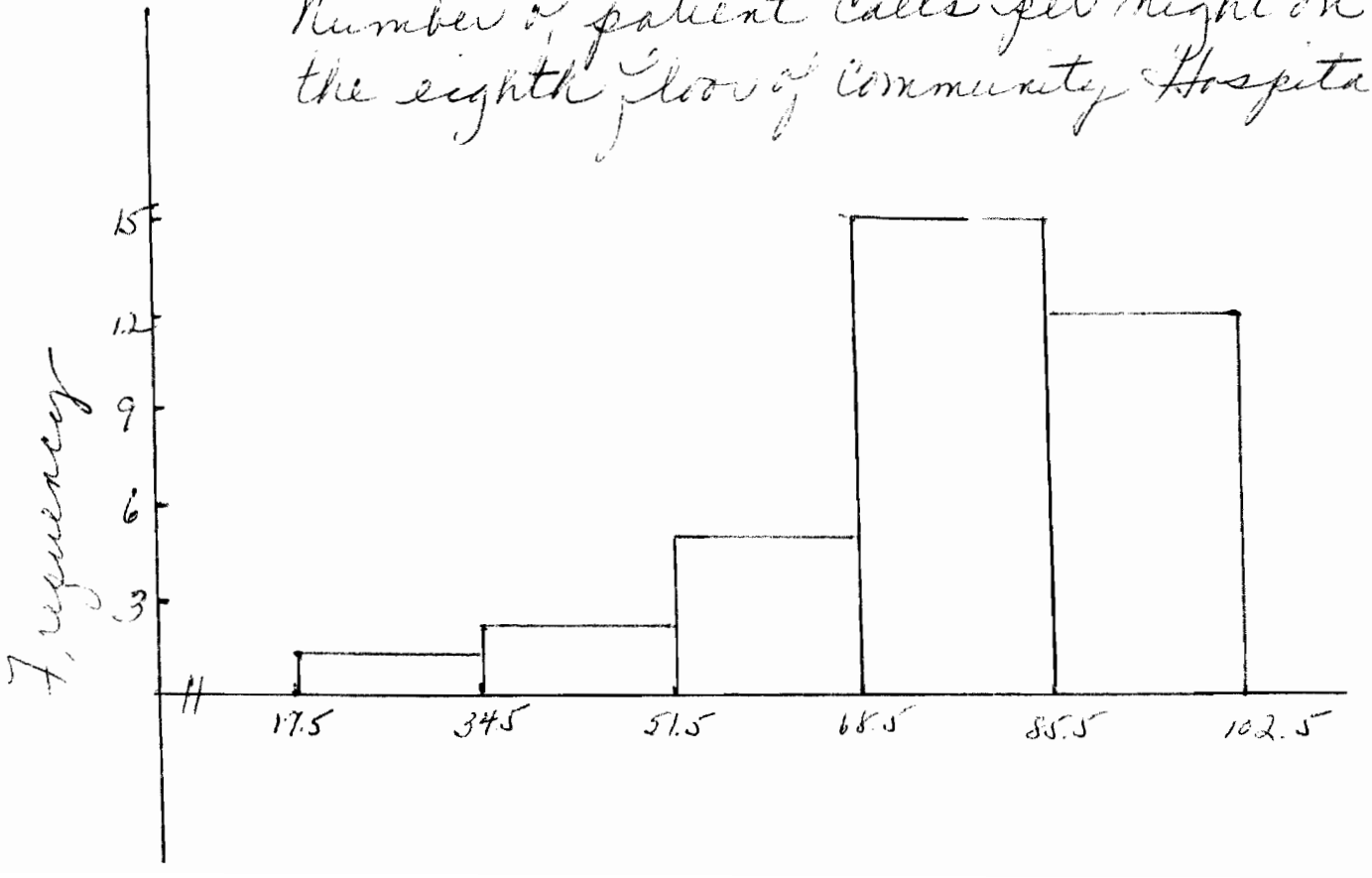
Range = 102 − 18 = 84

Class width > $\frac{84}{5}$

Classes	Tally	Frequency
18 – 34	I	1
35 – 51	II	2
52 – 68	++++	5
69 – 85	++++ ++++ ++++	15
86 – 102	++++ ++++ II	12

Class width = 17

Number of patient calls per night on the eighth floor of Community Hospital



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95	70	74	46	18	84	82	75	63	101	77	87
102	80	86	85	73	86	62	100	90	37	88	

Use the data to make a **box-and-whisker plot.** (10 points)

Stem	Leaves
1	8
2	
3	7
4	6
5	8
6	4 0 9 2 3
7	0 4 0 3 5 1 1 7 0
8	0 6 5 3 4 6 2 6 8 7
9	5 0 0 2
10	2 0 1

Stem	Leaves
1	8
2	
3	7
4	6
5	8
6	0 2 3 4 9
7	0 0 0 1 1 3 4 5 7
8	0 2 3 4 5 6 6 6 7 8
9	0 0 2 5
10	0 1 2

Q_1, M, Q_3

location of $M = \frac{35+1}{2} = 18^{th}$

$M = 77$

location of $Q_1 + Q_3 = \frac{17+1}{2} = 9^{th}$

$Q_1 = 69$, $Q_3 = 87$

L	Q_1	M	Q_3	H
18	69	77	87	102