FINITE MATH   STATISTICS   EXAM CR   NAME _____

SHOW ALL WORK ON THIS TEST OR SEPARATE PAPER. Justify all answers.
CALCULATORS ARE ALLOWED.

1. Given the numbers: 37, 42, 37, 19, 35
   a) find the mean   **b) find the median**   **c) find the mode.**

2. Given the numbers: 102, 42, 24, 102, 18, 42
   a) find the mean   **b) find the median**   **c) find the mode.**

3. Given the numbers: 748, 420, 652, 37, 88, 155, 125, 65, 122
   a) find the mean   **b) find the median**   **c) find the mode.**

4. Given the following frequency distribution, find the mean, the median, and the mode:

Value	Frequency
100	4
90	3
80	2
30	1

5. **Find the standard deviation of the following set of numbers.**

<div>

10
12
6
12

</div>

6. **Find the standard deviation of a population based upon the following sample of numbers selected from the population.**

<div>

12
20
35
2
4
17

</div>

7. A set of math test scores is normally distributed with mean of 70 and standard deviation of 10. A set of English test scores is also normally distributed with mean 80 and standard deviation 6. Comparatively speaking, which would be the better score: an 80 on the math test or an 85 on the English test. Explain why.   (Be specific, show some work!)

SHOW ALL WORK:

8. **A set of scores is normally distributed with mean 100 and standard deviation 15.**

a) **What percent of scores are above 100?** _____

b) **What percent of scores are between 85 and 115?** _____

c) **What percent of scores are between 70 and 85?** _____

d) **What percent of scores are below 115?** _____

e) **What percent of scores are above 130?** _____

f) **What percent of scores are between 70 and 115?** _____

9. Wages of a company are normally distributed with mean $12.00 per hour and standard deviation $2.00.

a) Ninety five percent of the wages are between _____ and _____.

b) About two thirds of the wages are between _____ and _____.

c) What percent of wages are between $8.00 and $10.00?

d) What percent of wages are above $14.00?

e) What percent of wages are less than $8.00?

f) What percent of wages are between $10.00 and $18.00 ?

10. Use a z-table to answer the following questions concerning the weights of chickens that are normally distributed with mean of 2000 grams and standard deviation of 200 grams.

a) what percent of the chickens weigh between 2000 and 2300 grams?

b) what percent of the chickens weigh between 2300 and 2500 grams?

c) what percent of the chickens weigh between 1500 and 2300 grams?

d) what percent of the chickens weigh more than 2500 grams?

MULTIPLE CHOICE:

11. Juan did comparison shopping on his favorite brand of cereal. Over half of the stores priced the cereal at $2.80. Most of the other stores priced the cereal at $2.90, except for a few who charged $3.00. Which statement is true about the distribution of prices?

A. The mean is less than mode.
B. The mean is less than median.
C. The mean and mode are the same.
D. The mean is greater than mode.

12. In a mathematics class, half the students scored 85 on an achievement test. Most of the remaining students scored 75 except for a few students who scored 20. Which of the following statements is true about the distribution of scores?

A. The mean is less than median.
B. The mean is greater than median.
C. The mean and mode are the same.
D. The mean and median are same.

10. A political activist is interested in determining how strong the support is among registered voters in the United States for the president's health-care plan. Which of the following procedures would be most appropriate for selecting a statistically unbiased sample?

   A. Have viewers call in to a nationally broadcast talk show and give their opinions.
   B. Survey registered voters selected by blind drawing in the three largest states.
   C. Select regions of the country by blind drawing and then select people from the voter registration list by blind drawing.
   D. Pass out survey forms at the front entrance of hospitals selected by blind drawing and ask people entering and exiting to fill them in.

11. The circle graph below represents the hair color preference of 500 people who use hair coloring products. How many of these people chose to color their hair blonde?

   A. 420   B. 210   C. 155   D. 42

12. The graph below represents the ages of a random selection of people who caught a particular virus in 1993. Select the statement that is true about the distribution of ages.

   A. The mode is greater than the mean.
   B. The mode and the mean are the same.
   C. The median is greater than the mode.
   D. The median and the mode are the same.

13. The following plot depicts the rainfall in inches and the yields of wheat in bushels per acre.

A. There is no apparent association between rainfall and yield.
B. There is a positive association between rainfall and yield.
C. There is a negative association between rainfall and yield.
D. An increase in rainfall caused an increase in yield.

14. The table below shows the distribution of weekly work hours for employees at a fast-food restaurant. What percent of the employees worked less than 21 hours per week?

A. 66%   B. 34%   C. 28$%   D. 23%

15. The table below shows the distribution of majors for a group of college students. Of 500 students, how many would be expected to be psychology majors?

A. 0.19   B. 95   C. 406   D. 9

STATISTICS EXAM CR Solutions

1. 19, 35, (37) 37, 42
   a) mean = (34)
   b) media_ = (37)
   c) mode = (37)

2. 18, 24, (42, 42) 102, 102
   a) mean = (55)
   b) media_ (42)
   c) mode = (42 a_d 102)
      (Bimodal)

3. 37, 65, 88, 122, (125,
   155, 420, 452, 748
   a) mean = (268)
   b) median (125)
   c) mode = (None)

4.
value	Freq
100 × 4	= 400
90 × 3	= 270
80 × 2	= 160
30 × 1	= 30

   10 $\overline{)860}$
   a) mean = (86)
   b) med = (90)
   c) mode = (100)

5.
		Dev.	(Dev)²
10	-10 =	0	0
12	-10	2	4
6	-10	-4	16
12	-10	2	4

   $\boxed{use\ n}$
   4$\overline{)40}$ 4$\overline{)24}$
   10   6
   s.d = $\sqrt{6}$
   (2.45)

6.
		Dev	(Dev)²
12	-15 =	-3	9
20	-15 =	5	25
35	-15 =	20	400
2	-15 =	-13	169
4	-15 =	-11	121
17	-15 =	2	4

   $\boxed{use\ n-1}$
   6$\overline{)90}$ 5$\overline{)728}$
   15   145.6
   s.d = $\sqrt{145.6}$
   = (12.07)

7. $z = \frac{score - mean}{s.d.}$

   $z_{math} = \frac{80-70}{10} = \frac{10}{10} = 1$

   $z_{english} = \frac{85-80}{6} = \frac{5}{6} = .83$

   (80 in math is better) since it
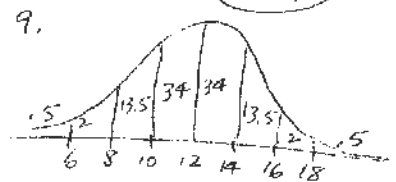   is farther to the right of mean.
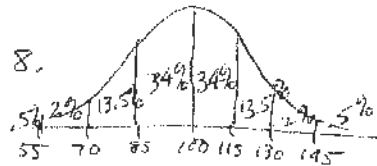
8.
   a) Above 100 = (50%)
   b) Betw 85 + 115 = (68%)
   c) Betw. 70 and 85 = 13.5%
   d) Below 115 = 50 + 34 = (84%)
   e) Above 130? (2.5%)
   f) Below 70 + 115 = 13.5 + 34 + 34
      = (81.5%)

9.
   a) 95% between ± 2 s.d.
      (8) and (16)
   b) 2/3 between (10) and (14)
   c) Betw 8 + 10 = (13.5%)
   d) Above 14 = 13.5 + 2 + .5
      = (16%)
   e) Less 8 = (2.5%)
   f) Betw #10 + #18
      = 34 + 34 + 13.5 + 2
      (83.5%)

10. mean = 2000 g   s.d = 200 g
    a) $z_{2300} = \frac{2300 - 2000}{200}$
       = 1.5 sd
       A = .433 (43.3%)

    b) $z_{2500} = \frac{2500 - 2000}{200}$
       = 2.5 sd
       A = .494
       - .433
       .061 = (6.1%)

    c) $z_{1500} = \frac{1500 - 2000}{200}$
       = -2.5 s.d.
       A = .494
       + .433
       .927 (92.7%)

    d) .5000
       2000

11. mode = $\overset{\$}{2.80}$
    median = $\overset{\$}{2.80}$ (D)
    mean = higher

12. mode = 85
    median = $\frac{85 + 75}{2}$
    mean = lower   (A)

13. mode = 42
    mean = lower
    (A)

14. Positive association
    NOT cause + effect.
    (B)

15. .11
    + .23
    .34
    34% (B)

16. 19% of 500
    .19 × 500
    95   (B)