

Read the instructions carefully. Each question is worth 8 points. Circle the correct answer for each problem.

1. What sampling technique is used in the following: A tax auditor selects every 1000th income tax return that he receives.
a. cluster b. random c. convenience d. stratified e. systematic

2. Evaluate the following: $P(Z < 0.97)$
a. 0.1660 b. 0.8340 c. 0.8315 d. 0.8078

3. Find the standard deviation for the following *sample*: 2, 6, 15, 9, 11, 22, 1, 4, 8, 19
a. 2.1 b. 6.8 c. 7.1 d. 6.3

4. In a binomial experiment, a trial is repeated 10 times. Find the probability of 2 successes given the probability of 0.36 of success on a given trial.
a. 0.148 b. 0.131 c. 0.164 d. 0.274

5. The weights (in pounds) of 30 newborn babies are listed below. Find Q1.

5.5 5.7 5.8 6.0 6.1 6.1 6.3 6.4 6.5 6.6
6.7 6.7 6.7 6.9 7.0 7.0 7.0 7.1 7.2 7.2
7.4 7.5 7.7 7.7 7.8 8.0 8.1 8.1 8.3 8.7

- a. 7.5 b. 5.8 c. 6.4 d. 6.3
6. A chicken farmer in Grayslake claims that his chickens have a mean weight of 58 ounces. The farmer takes a random sample of 36 chickens and finds a mean weight of 59.2 ounces and a standard deviation of 3 ounces. In a hypothesis test, what criterion would be used for rejecting the farmer's claim at the 10 percent level of significance?
- a. Reject H_0 that $\mu = 58$ ounces if test value > 1.28 .
b. Reject H_0 that $\mu = 58$ ounces if test value > 1.28 or < -1.28 .
c. Reject H_0 that $\mu = 58$ ounces if test value > 1.65 .
d. Reject H_0 that $\mu = 58$ ounces if test value > 1.65 or < -1.65 .
7. Find the value of $P(2)$ that will make the following a discrete probability distribution:

x	P(x)
0	0.232
1	0.346
2	
3	0.129
4	0.101
5	0.250

- a. -0.058
b. 0.058
c. No value of $P(2)$ will create a discrete probability distribution.
d. Any value of $P(2)$ will create a discrete probability distribution.

12. Use the given data to find the equation of the regression line. Round the final values to three significant digits, if necessary.

x	6	8	20	28	36
y	2	4	13	20	30

- a. $y' = -3.79 + 0.897x$ b. $y' = -3.79 + 0.801x$ c. $y' = -2.79 + 0.897x$ d. $y' = -2.79 + 0.950x$

13. Find the original data from the following stem-and-leaf plot:

Stem	Leaves
5	1 7
6	1 1 4 6
7	1 4 4 7 9
8	4 5

- a. 6, 12, 6, 6, 9, 11, 8, 8, 11, 14, 16, 12, 13, 15
 b. 51, 57, 61, 61, 64, 66, 71, 74, 74, 77, 79, 84, 85
 c. 54, 54, 55, 61, 61, 64, 66, 71, 71, 84, 85
 d. 51, 57, 64, 64, 66, 74, 75, 77, 79, 84, 85
14. Find the critical t value or values for the given hypothesis, sample size, and significance level.

$$H_0: \mu \leq 53.3$$

$$n = 11$$

$$\alpha = 0.01$$

- a. -2.764 b. -2.718 c. 2.718 d. 2.764

15. The frequency table below shows the distribution of the weekly incomes of the employees of a firm. Construct the relative frequency table.

Incomes	Relative Frequency
200 – 300	50
301 – 400	65
401 – 500	67
501 – 600	84
> 600	11

a.

Incomes	Frequency
200 – 300	18.05%
301 – 400	23.47%
401 – 500	24.19%
501 – 600	30.32%
> 600	3.97%

b.

Incomes	Frequency
200 – 300	23.76%
301 – 400	30.66%
401 – 500	4%
501 – 600	17.79%
> 600	23.84%

c.

Incomes	Frequency
200 – 300	12.5%
301 – 400	20.1%
401 – 500	37.3%
501 – 600	15.2%
> 600	14.9%

d.

Incomes	Frequency
200 – 300	15.5%
301 – 400	22.1%
401 – 500	31.3%
501 – 600	16.2%
> 600	14.9%

16. Identify the following random variable as either continuous or discrete:
the number of freshmen entering college in a certain year

a. discrete

b. continuous

17. The following frequency distribution analyzes the scores on a math test. Find class boundaries in the interval 40 – 59.

Scores	Number of Students
40 – 59	2
60 – 75	4
76 – 82	6
83 – 94	15
95 – 99	5

a. 40.5, 58.5

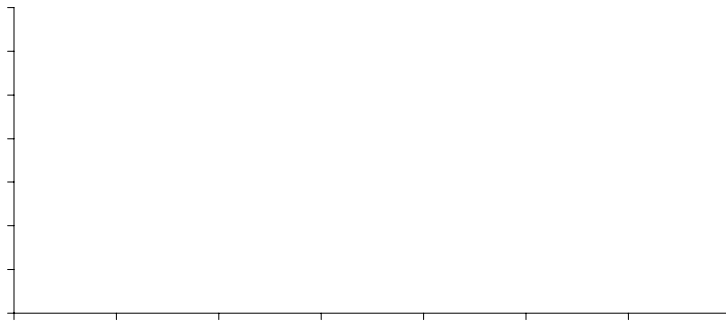
b. 40.5, 59.5

c. 39.5, 58.5

d. 39.5, 59.5

18. In a survey, 20 voters were asked their age. The results are summarized in the frequency table below. Construct a histogram corresponding to the frequency table. Be sure to label your axes appropriately.

Age of Voter	Number of Voters
20 – 29	5
30 – 39	5
40 – 49	6
50 – 59	0
60 – 69	4



19. In a game, you have a $\frac{1}{27}$ probability of winning \$56 and a $\frac{26}{27}$ probability of losing \$9. What is the expected value?
- a. -\$8.67 b. -\$6.59 c. \$10.74 d. \$2.07
20. How many 4-digit numbers can be formed if repetition of digits is not allowed?
- a. 1,048,576 b. 10,000 c. 210 d. 5040

21. A survey of shoppers is planned to see what percentage use credit cards. Prior surveys suggest 61% of shoppers use credit cards. Find the minimum sample size you should use to assure that your estimate, \hat{p} , will be within 0.02 units of the population p . The confidence level is 95%.

a. 2,057

b. 5,858

c. 2,285

d. 3,944

22. A random sample of 143 full-grown lobsters had a mean weight of 18 ounces and a standard deviation of 3.1 ounces. Construct a 98 percent confidence interval for the mean weight μ of all such lobsters.

a. $17.5 < \mu < 18.5$

b. $17.3 < \mu < 18.7$

c. $17.6 < \mu < 18.4$

d. $17.4 < \mu < 18.6$

23. You are dealt two cards successively (without replacement) from a shuffled deck of 52 playing cards. Find the probability that both cards are black.

a. $\frac{25}{51}$

b. $\frac{25}{102}$

c. $\frac{1}{2652}$

d. $\frac{13}{51}$

24. A cereal company claims that the mean weight of the cereal in its packets is at least 14 oz. You wish to test this claim at the 0.02 level of significance. The mean weight for a random sample of $n = 54$ cereal packets is 13.6 ounces with a standard deviation of 0.7 ounces. Compute the test value.

a. $z = 4.20$

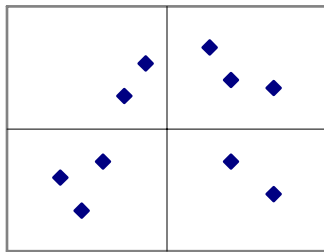
b. $z = -4.20$

c. $z = -0.57$

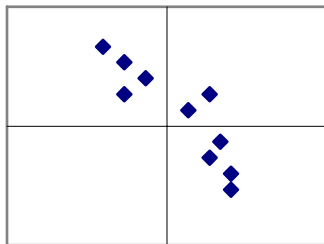
d. $z = -30.86$

25. Determine which plot shows the strongest linear correlation.

a.



b.



c.

