Exam

Name_____

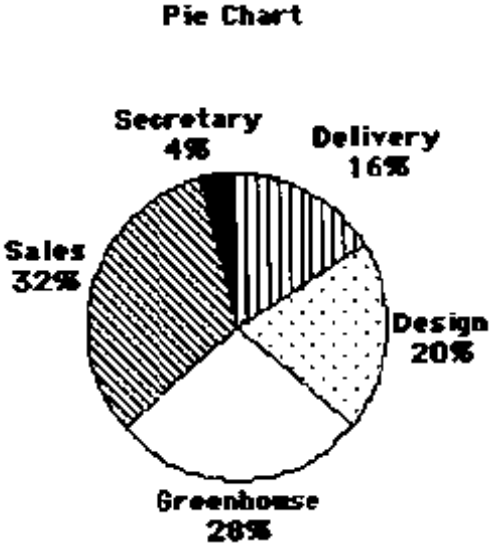
1) When an administrator at a local hospital prepares a series of charts and graphs pertaining to the patients that have stayed at the hospital during the past month, she is using which general category and statistical analysis? 1) _____

A) Descriptive statistics B) Quantitative statistics
C) Inferential statistics D) None of the others.

2) Which of the following is an example of graphs used to describe data? 2) _____

A) Both A and B are correct. B) Bar charts
C) Histograms D) None of the others.

3) The Excel pie chart below describes the types of jobs for the 50 employees at Zimmerman's Florist. 3) _____



What percent of employees are designers?

A) 20% B) 32% C) 16% D) 28%

4) A car salesman has noted that the probability that the dealership sells a car on a Saturday morning is 0.30. Then the probability of the dealership not selling a car on Saturday morning is ..... 4) _____

A) 0.70 B) 0.15 C) 0.21 D) 0.18

5) If two events are independent, then by definition they must also be mutually exclusive. 5) _____

A) False B) True C) D)

6) A used car lot has 15 cars. Five of these cars were manufactured in the U.S. and the remainder were made in other countries. If three cars are purchased, what is the probability that all three will be U. S. made cars? 6) _____

A) 0.022 B) 0.034 C) 0.048 D) 0.280

7) The following probability distribution was subjectively assessed for the number of sales a salesperson would make if they made five sales calls in one day. 7) _____

Sales	Probability
0	0.10
1	0.15
2	0.20
3	0.30
4	0.20
5	0.05

Determine the probability that the number of sales is 2 or 3.

A) 0.50 B) 0.15 C) 0.65 D) 0.80

8) When a customer comes to a bank, there are three primary locations they may select to go to: teller, loan officer, or escrow department. Based on past experience, the following probability distribution applies: 8) _____

Location	Probability
Teller	0.60
Loan Officer	0.30
Escrow	0.10

Seventy percent of customers are males. Determine the probability that three consecutive customers all go to a teller.

A) 0.22 B) 0.15 C) 0.40 D) 0.70

9) The following probability distribution was subjectively assessed for the number of sales a salesperson would make if they made five sales calls in one day. 9) _____

Sales	Probability
0	0.10
1	0.15
2	0.20
3	0.30
4	0.20
5	0.05

When the salesperson makes a sale, there are three possible sales levels: large, medium, and small. The probability of a large sale is 0.20 and the chance of a medium sale is 0.60. If a salesperson makes two sales, the probability that at least one is large is 0.36.

A) 0.36 B) 0.11 C) 0.25 D) 0.60

10) The Ski Patrol at Criner Mountain Ski Resort has determined the following probability distribution for the number of skiers that are injured each weekend: 10) _____

Injured Skiers	Probability
0	0.05
1	0.15
2	0.40
3	0.30
4	0.10

Based on this information, what is the expected number of injuries per weekend?

A) 2.25 B) 1.00 C) 2.50 D) 3.50

11) The random variable, number of customers entering a store between 9 AM and noon, is an example of a discrete random variable. 11) _____

A) True B) False C) D)

12) Bill Price is a sales rep in northern California representing a line of athletic socks. Each day, he makes 10 sales calls. The chance of making sale on each call is thought to be 0.30. What is the probability that he will make exactly two sales?. 12) _____

A) 0.2335 B) 0.5002 C) 0.300 D) 0.009

13) The Nationwide Motel Company has determined that 70 percent of all calls for motel reservations request non-smoking rooms. Recently, the customer service manager for the company randomly selected 25 calls. Assuming that the distribution of calls requesting non-smoking rooms is described by a binomial distribution, determine the probability that more than 20 customers in the sample will request non-smoking rooms. 13) _____

A) 0.09 B) 0.50 C) 0.35 D) 0.12

14) The number of customers that arrive at a fast-food business during a one-hour period is known to be Poisson distributed with a mean equal to 8.60. What is the probability that between 2 and 3 customers inclusively will arrive in one hour. 14) _____

A) 0.0263 B) C) D)

15) The Brockingham Carpet Company prides itself on high quality carpets. At the end of each day, the company quality managers select 3 square yards for inspection. The quality standard calls for an average of 2.3 defects per square yard. The expected number of defects that the inspector will find during the inspection is 6.9. 15) _____

A) 6.9 B) 2.3 C) 0.77 D) 5.29

16) The following probability distribution has been assessed for the number of accidents that occur in a midwestern city each day: 16) _____

Accidents	Probability
0	0.25
1	0.20
2	0.30
3	0.15
4	0.10

Based on this probability distribution, the standard deviation in the number of accidents per day is:

A) None of the others. B) 2.65.
C) 2. D) 0.12.

17) The time it takes to assemble a children's bicycle by a parent has been shown to be normally distributed with a mean equal to 295 minutes with a standard deviation equal to 45 minutes. Given this information, what is the probability that it will take a randomly selected parent between 300 and 340 minutes?. Let P(Z < 0) = 0.5000, P(Z <0.11) = 0.5438, P(Z <1) = 0.8413 17) _____

A) 0.2975 B) 0.0438 C) 0.3413 D) 1.000

18) Let X be a normal distribution with the mean of 4 and the variance of 9. Find the value of x such that P(x < X < 7) = 0.5. Let P(Z < 0) = 0.5, P(Z < 1) = 0.8413, P(Z < -0.4) = 0.3413. 18) _____

A) 2.8 B) 0 C) 7 D) 4

19) The standard deviation for an exponential distribution often exceeds the mean. 19) _____

A) False B) True C) D)

20) If the time it takes for a customer to be served at a fast-food chain business is thought to be uniformly distributed between 3 and 8 minutes, what is the probability that the time it takes for a randomly selected customer will be less than 5 minutes? 20) _____

A) 0.40 B) 0.80 C) 0.30 D) 0.20

21) Let X be a random variable has the density function 21) _____
$f(x) = 1/x^2$, $0.5 < x < 1$.

Calculate $E[X^2]$

A) 0.5 B) 1.0 C) ln(2) D) 0.75

22) The manager of a computer help desk operation has collected enough data to conclude that the distribution of time per call is normally distributed with a mean equal to 8.21 minutes and a standard deviation of 2.14 minutes. The manager has decided to have a signal system attached to the phone so that after a certain period of time, a sound will occur on her employees' phone if she exceeds the time limit. The manager wants to set the time limit at a level such that it will sound on only 8 percent of all calls. Let P(Z < 1.41) = 0.92, P(Z < -1.41) = 0.08, the time limit should be: 22) _____

A) about 11.23 minutes. B) about 14.58 minutes.
C) 10.35 minutes. D) approximately 5.19 minutes.

23) The transportation manager for the State of New Jersey has determined that the time between arrivals at a toll booth on the state's turnpike is exponentially distributed with $\lambda = 4$ cars per minute. Based on this information, what is the probability that the time between any two cars arriving will exceed 11 seconds? 23) _____

A) Approximately 0.48
B) Approximately 1.0
C) About 0.52
D) None of the others.

24) You are given the following data: 24) _____

23 34 11 40 25 47

Assuming that the data reflect a sample from a larger population, what is the sample mean?

A) 30 B) 25 C) 22 D) 32

25) You are given the following data: 25) _____

23 34 11 40 25 47

Assuming that these data are a sample selected from a larger population, the median value for these sample data is .....

A) 29.5 B) 25.5 C) 34 D) 40

26) Suppose a study of houses that have sold recently in your community showed the following frequency distribution for the number of bedrooms: 26) _____

Bedrooms	Frequency
1	1
2	18
3	140
4	57
5	11

Based on this information, determine the mode for the data.

A) 3 B) 140 C) 4 D) 57

27) The third quartile for a set of data will typically have a value that is 25 percent higher than the median for the same set of data. 27) _____

A) False B) True C) D)

28) The Good-Guys Car Dealership has tracked the number of used cars sold at its downtown dealership. Consider the following data as representing the population of cars sold in each of the 8 weeks that the dealership has been open. 28) _____

3 5 2 7 7 7 9 0

What is the population standard deviation approximately?

A) 2.87 cars B) 3 cars C) 2.50 cars D) 7 cars

29) One of the advantages that a stem & leaf diagram has over a histogram is: 29) _____

A) the detail of the data is preserved.
B) it can be used with nominal data.
C) it shows the general distribution of a quantitative variable.
D) There are no advantages.

30) Which of the following statements is not consistent with the Central Limit Theorem? 30) _____

A) The Central Limit Theorem applies without regard to the size of the sample.
B) The Central Limit Theorem indicates that the sampling distribution will be approximately normal.
C) The Central Limit Theorem applies to non-normal distributions.
D) The Central Limit Theorem indicates that the mean of the sampling distribution will be equal to the population mean.

31) The monthly electrical utility bills of all customers for the Far East Power and Light Company are known to be distributed as a normal distribution with mean equal to $87 a month and standard deviation of $36. If a statistical sample of n = 100 customers is selected at random, what is the probability that the mean bill for those sampled will exceed $75? Let P(Z < -3.33) = 0, P(Z < 0.33) = 0.63 and P(Z < -0.44) = 0.33. 31) _____

A) About 1.00
B) Approximately 0.63
C) 0.33
D) None of the others.

32) The Olsen Agricultural Company has determined that the weight of hay bales is normally distributed with a mean equal to 80 pounds and a standard deviation equal to 8 pounds. Based on this, what is the mean of the sampling distribution for $\bar{x}$ if the sample size is n = 64? 32) _____

A) 80
B) Between 72 and 88
C) 10
D) None of the others.

33) In an application to estimate the mean number of miles that downtown employees commute to work roundtrip each day, the following information is given: 33) _____

n = 20
$\bar{x}$ = 4.33
s = 3.50

The point estimate for the true population mean is:

A) 4.33.
B) 1.638.
C) 4.33 ± 1.638.
D) None of the above.

34) In an application to estimate the mean number of miles that downtown employees commute to work roundtrip each day, the following information is given: 34) _____

n = 20
$\bar{x}$ = 4.33
s = 3.50

Based on this information and let $t_{0.025,19} = 2.09$, the upper limit for a 95 percent confidence interval estimate for the true population mean is:

A) about 5.97 miles.
B) nearly 12.0 miles.
C) about 7.83 miles.
D) None of the above.

35) A major tire manufacturer wishes to estimate the mean tread life in miles for one of their tires. They wish to develop a confidence interval estimate that would have a maximum sampling error of 500 miles with 90 percent confidence. A pilot sample of n = 50 tires showed a sample standard deviation equal to 4,000 miles. Based on this information and let $z_{0.05} = 1.645$, the required sample size is: 35) _____

A) 174. B) 124. C) 246. D) 196.

36) A random sample of n = 500 people were surveyed recently to determine an estimate for the proportion of people in the population who had attended at least some college. The estimate concluded that between 0.357 and 0.443 of the population had attended. Given this information and let $z_{0.025} = 1.96$, we can determine that the confidence level was approximately 95 percent. 36) _____

A) True B) False C) D)

37) A random sample of 340 people in Chicago showed that 66 listened to WJKT - 1450, a radio station in South Chicago Heights. Based on this sample information, what is the point estimate for the proportion of people in Chicago that listen to WJKT - 1450? 37) _____

A) About 0.194
B) 340
C) Can't be determined without knowing the desired confidence level.
D) None of the above.

38) Given $\bar{x}$ = 15.3, s = 4.7, and n = 18, form a 99% confidence interval for σ^2. Let $\chi^2_{0.005,17} = 35.72$ and $\chi^2_{0.995,17} = 5.70$. 38) _____

A) (10.51, 65.88) B) (13.61, 43.30) C) (2.24, 14.02) D) (11.13, 69.79)

39) Your statistics instructor claims that 60 percent of the students who take her Elementary Statistics class go through life feeling more enriched. For some reason that she can't quite figure out, most people don't believe her. You decide to check this out on your own. You randomly survey 64 of her past Elementary Statistics students and find that 34 feel more enriched as a result of her class. Assume that significance level of 0.05 ($z_{0.025} = 1.96$, $z_{0.05} = 1.65$). Which of the following states is true? 39) _____

A) The value of the test statistic is -1.123. There is sufficient evidence to support your statistic instructor's claim
B) The value of the test statistic is -2.97. There is not sufficient evidence to support your statistic instructor's claim
C) The value of the test statistic is 1.123. There is sufficient evidence to support your statistic instructor's claim
D) The value of the test statistic is 2.97. There is not sufficient evidence to support your statistic instructor's claim

40) According to an article in Newsweek, the natural ratio of girls to boys is 100:105. In Vietnam, the birth ratio is 100: 114 (46.7% girls). Suppose you don't believe the reported figures of the percent of girls born in Vietnam. You think that the percent of girls born in Vietnam is less than 46.7%. You conduct a study. In this study, you count the number of girls and boys born in 150 randomly chosen recent births. There are 60 girls and 90 boys born of the 150. Based on the results, draw your conclusion. Use α = 2% ($z_{0.01} = 2.33$ and $z_{0.02} = 2.05$). 40) _____

A) The percent of girls born in Vietnam is less than 46.7%
B) The percent of girls born in Vietnam is equal 46.7%
C) The percent of girls born in Vietnam is more than 46.7%
D) None of the others

41) When a new drug is created, the pharmaceutical company must subject it to testing before receiving the necessary permission from the Food and Drug Administration (FDA) to market the drug. Suppose the null hypothesis is "the drug is unsafe." What is the Type II Error? 41) _____

A) To claim the drug is unsafe when, in fact, it is safe.
B) To claim the drug is unsafe when, in fact, it is unsafe
C) To claim the drug is safe when, in fact, it is safe
D) To claim the drug is safe when, in fact, it is unsafe

42) An assembly line produces widgets with a mean weight of 10 and a standard deviation of 0.2. A new process supposedly will produce widgets with the same mean and a smaller standard deviation. A sample of 20 widgets produced by the new method has a sample standard deviation of 0.126. At a significance level of 10%, what is the value of the test statistic χ_0^2? 42) _____

A) 7.55 B) C) D)

43) The cost of a college education has increased at a much faster rate than costs in general over the past twenty years. In order to compensate for this, many students work part- or full-time in addition to attending classes. At one university, it is believed that the average hours students work per week exceeds 20. To test this at a significance level of 0.05 ($t_{0.025,19} = 2.09$ and $t_{0.05,19} = 1.73$), a random sample of n = 20 students was selected and the following values were observed: 43) _____

26	15	10	40
10	20	30	36
40	0	5	10
20	32	16	12
40	36	10	0

Based on these sample data, the critical value:

A) is approximately equal to 1.73.
B) cannot be determined without knowing the population standard deviation.
C) is approximately equal to 2.09.
D) None of the others.

44) A soft drink company has a filling machine that can be set at different levels to produce different average fill amounts. The company sets the machine to provide a mean fill of 15 ounces. The standard deviation on the machine is known to be 0.20 ounces. Assuming that the hypothesis test is to be performed using a random sample of n = 100 cans, which of the following would be the correct formulation of the null and alternative? 44) _____

A) H_0 : μ = 15 ounces
H_1 : μ ≠ 15 ounces

B) H_0 : $\bar{x} \leq$ 15 ounces
H_1 : $\bar{x} >$ 15 ounces

C) H_0 : μ ≠ 15 ounces
H_1 : μ = 15 ounces

D) None of the others.

45) A bank is interested in determining whether their customers' checking balances are linearly related to their savings balances. A sample of n = 20 customers was selected and the correlation was calculated to be +0.40. If the bank is interested in testing to see whether there is a significant linear relationship between the two variables using a significance level of 0.05, what is the value of the test statistic? 45) _____

A) 1.8516 B) 1.96 C) 1.645 D) 2.438

46) The following regression model has been computed based on a sample of twenty observations: $\hat{y}$ = 34.2 + 19.3*x*. The first observations in the sample for y and x were 300 and 18, respectively. Given this, the residual value for the first observation is approximately ..... 46) _____

A) 81.6 B) 381.6 C) 34.2 D) 300

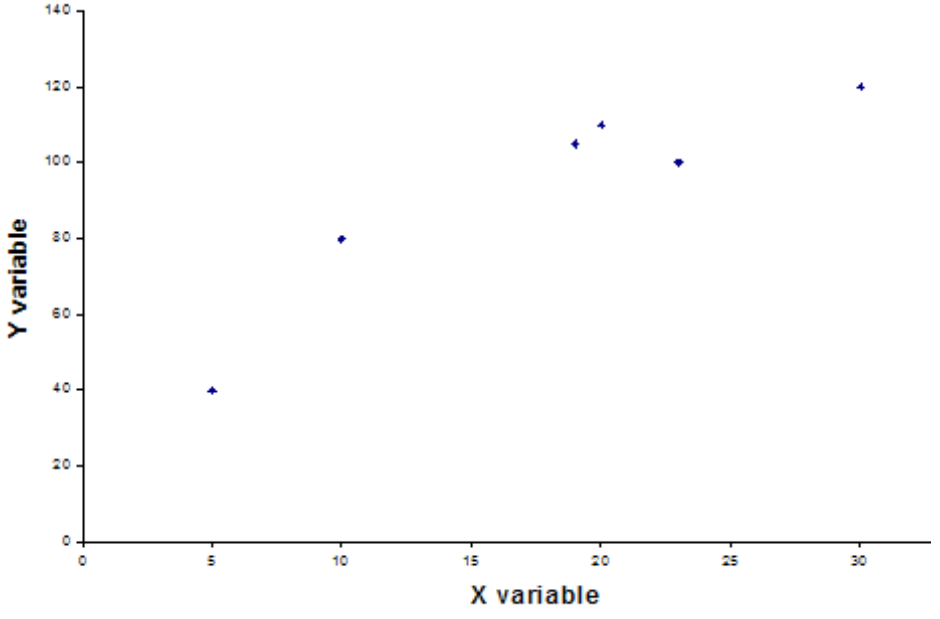
47) State University recently randomly sampled seven students and analyzed grade point average (GPA) and number of hours worked off-campus per week. The following data were observed: 47) _____

GPA	HOURS
3.14	25
2.75	30
3.68	11
3.22	18
2.45	22
2.80	40
3.00	15
2.23	29
3.14	10
2.90	0

The simple linear regression equation based on these sample data is $\hat{y}$ = 3.25 - 0.016x.

A) True B) False C) D)

48) Consider the following chart. Which of the following statements is most correct? 48) _____



A) There is a positive linear relationship between the two variables.
B) There is a perfect linear relationship between the two variables.
C) There is a negative linear relationship between the two variables.
D) There is no apparent relationship between the two variables.

49) Find the value of the linear correlation coefficient r. 49) _____

x	62	53	64	52	52	54	58
y	158	176	151	164	164	174	162

A) -0.775 B) 0 C) 0.754 D) -0.881

50) Over a period of one year, a greengrocer sells tomatoes at six different prices (x pence per kilogram). He calculates the average number of kilograms, y, sold per day at each of the six different prices. From these data the following are calculated 50) _____

$\sum x_i = 200, \sum y_i = 436, \sum x_i y_i = 12515, \sum x_i^2 = 7250, \sum y_i^2 = 39234, n = 6.$

Estimate the correlation coefficient.

A) -0.962 B) 0.962 C) 0.055 D) -0.055

Key: Correct answers are always A

If you have any questions, please feel free to contact either your teacher or DungNT (email dungnt@fpt.edu.vn)