MCQ

1. Which of the following statements is true regarding a simple linear regression model?

   a. The proportion of variation that is unexplained is the correlation coefficient

   b. SSR must be greater than SSE if the coefficient of determination is larger than 0.5

   c. The intercept coefficient must have the same sign as the coefficient of determination

   d. None of the above answers are correct

2. Which of the following statements is true?

   a. The central limit theorem states that no more than 68% of the observations lies within one standard deviation of the mean

   b. The central limit theorem states that the sampling distribution of the mean will be approximately normal regardless of the shape of the populations distribution as the sample size becomes large

   c. The central limit theorem states that the standard error of the sampling distribution of the mean can be approximated by $\frac{\sigma}{\sqrt{n}}$ as long as the population distribution is symmetric.

   d. The population must be normal and the population standard deviation must be unknown in order for the C.L.T to be valid

3. In order to use the normal distribution for interval estimates of the population mean when the populations standard deviation is known and the sample is very small

   a. the population must have a f-distribution with 30 degrees of freedom

   b. the population coefficient of variation must be large

   c. the sample standard deviation must be the same as the population standard deviation

   d. None of the above answers is correct

4. An interval estimate for the mean is a range of values used to estimate

   a. the sample average

   b. the sampling distribution

   c. the sampling error

   d. None of the above answers is correct

5. Forty shoppers were asked about their preferences towards the weight of a can of soup as either being 4 ounces, 6 ounces or 10 ounces Below are given their responses:

4	10	10	10	4	4	10	10	10	4
6	4	4	4	6	6	4	4	4	6
4	6	6	6	4	4	6	6	6	4
6	10	10	10	6	6	10	10	10	6

Which of the following is an appropriate graphical display for the above data?

   a. Bar Chart
   b. Chi-Square distribution curve
   c. Normal distribution curve
   d. Box plot

6. Four hundred people were asked whether gun laws should be more stringent. Three hundred said "yes" and 100 said "no". The point estimate of the proportion in the population who will respond "no" is

   a. 25

   b. 0.75

   c. Calculated as 0.25 minus sampling error as determine from the sample

   d. None of the above answers is correct

7. In calculating the sample size needed to estimate the population proportion, which of the following information in not needed?

   a. The maximum margin of error that can be tolerated

   b. The confidence coefficient

   c. An estimate of the true population proportion "p"

   d. Whether or not the population is symmetrically distributed

8. Since the population is always large than the sample, the value of the sample mean

   a. Is always larger than the population mean

   b. Is always equal to the population mean

   c. Is always less than the population mean

   d. Can be larger, smaller than or equal to the true value of the population mean

9. Sampling distributions are

a. The probability distribution that is assigned to populations parameters

✓ b. The probability distribution of sample statistics

c. Referring to the margin of error

d. None of the above answers is correct

10. Las year 55% of GS employees were female. It is believed that there has been a reduction in he percentage of females in the firm. Which of the following is the correct null and alternate hypotheses in testing the belief?

a. The correct hypothesis are Ho: p <= 0.45 and Ha: p>0.45

✓ b. The correct hypothesis are Ho: p >= 0.55 and Ha: p<0.55

c. Not enough information is given about sample to setup the hypothesis

d. None of the above is correct

Refer to the following information to answer questions 11 to 13

In a firm, sixty two percent of employees are male. Twenty-three percent of the employees earn more than $30000 per annum. Eighteen percent of the employees are male and earn more than $30,000 per year. Suppose that an employee is selected at random. Let A be the event that the selected employee is a male and B the event that the employee earns more than $30,000 a year.

11. Given that a selected employee is a female, what is the probability that the employee will earn $30,000 or less?

	M	F	
+30	.18	.05	.23
-30	.441	.33	.77
	.62	.38	

a. 38/75
b. 0.38
✓ c. 33/38
d. None of the above is a correct answer

12. Which of the following statements is not true?

✓ a. P(A)P(A|B)=P(B)P(B|A)
b. P(A U B) < P(A) + P(B)
c. P(A|Bc) = P(B|Ac)

d. Al of the above are true

13. Which of the followings statements is true?

a. A and Bc are independent
b. A and Bc are mutually exclusive
c. A and B cannot occur at the same time
d. None of the above answers is correct

14. There is a need to estimate the average total salary of CEO's in a given industry. A random sample of 18 CEO's is collected and the 97% confidence interval is estimated to be [2,181,260 – 5,836,180]. Which of the following statements is correct

a. 97% of the sampled total compensation values fell between [2,181,260 – 5,836,180]

b. In the population of CEO's 97% will have a compensation that falls between [2,181,260 – 5,836,180]

c. We are 97% confident that the mean of the sample falls in the interval [2,181,260 – 5,836,180]

d. None of the above answers is correct

15. A sample of account balances showed an average daily balance of $1040. The standard deviation of the population is $200. We want to know if the population mean is different from 1000. A z-stat was found to be 1.6. Which of the following is true?

a. The p-value can not be found since we don't know the sample size
b. The p-value s 0.0548
c. The p-value is 0.0274
d. None of the above answers is correct

16. In a new independent variable is added to an existing regression equation, then the resulting sample regression equation

a. will have SSE no bigger than that of the original sample regression equation
b. will have a smaller coefficient of correlation
c. will have a smaller SSR
d. None of the above answers is correct

17. Consider a distribution of 10 balances with a mean of $620. If an eleventh balance is added with a balance of $400 to the group, what is the average for the new group of 11 accounts?

$\frac{10}{11}(620) + \frac{1}{11}(400) = 600$

a. 600
b. 500
c. 510
d. 620

18. The least squares criteriod is used to find the estimated regression equation. As a result,

a. The predicted values of dependent variable must be smaller than the actual values
b. The sum of the errors must always be negative
c. The error terms must always equal 0
d. None of the above answers is correct

Refer to the following to answer questions 19 to 20

In last election, candidates that favored different parties were summarized as follows:

Republican: 0.34
Democrats: 0.43
Independents: 0.23

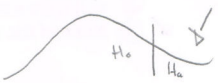
Reject H_0

A random sample of 400 voters showed that 172 favored the republicans, 164 favored the democrats and 64 favored the independents. The chi-square test statistic to test if the proportion has changed is found to be 18.42.

19. Which of the following statements is true?

a. A one tailed Chi-square test in not appropriate since the percentages can be lower
b. One should conclude that there is evidence at a 1% significance level that the percentages are no longer the same as before
c. The null hypothesis should state that the percentages before the campaign had changed and is accepted at a 1% level
d. None of the above is correct

18.42



9.21

20. The expected number of voters in the sample who did not favor the republicans after the campaign is

a. is 264 if the percentages had not changed
b. is 264 if the percentages had changed
c. cannot be determined with the given information
d. None of the above answers is correct

21. In a multiple regression analysis involving 15 independent variables SST = 800 and SSE = 240. The coefficient of determination is:

a. 0.5
b. 0.3
c. 0.7
d. None of the above answers is correct

22. You are given the following stem and leaf display of the data on the ages of students:

2|67
3|2266788
4|1111
5|235
6|1

Suppose that a histogram with a class width of 8 is constructed for the data set above. How many classes are there in the histogram

a. No more than 3
b. No more than 4
c. 6
d. None of the above answers is correct

23. The total bill for a group of students at a restaurant is $414.70. Each student will have to pay $18.85 if the students share the bill equally. Which of the following statements is true?

a. 18.85 is the median of all bills
b. The number of students who shared the bill is 22
c. At least one of the bills must equal 18.5
d. None of the above answers is correct

24. In multiple regression analysis, which of the following is incorrect?

a. The dependent variable is predicted by the independent variables with an error that is given by s
b. The sample values of the dependent variable is used to calculate SST
c. If the F value is significant, some independent variables may still have a non significant t-value
d. All of the above is correct

25. in a regression analysis, the error term e is a random variable. Which of the following regarding the mean or expected value of the error term is correct

a. the mean is zero since the error of prediction is always equal to 0
b. the mean is positive if there is a positive relationship
c. the mean can be any value depending on the strength of the relationship
d. None of the above suggested answers is true

26. An official of a union claims that the fraction of women in the union is not different from one half. A sample of 100 employees is selected and 47 of them are women. At a 5% level of significance which of the following is true?

a. The correct hypothesis are: Ho: p = 0.5 Ha: p does not equal 0.5
b. The null hypothesis should be p>= 0.5
c. The unions claim is surely wrong because the sample proportion is .47
d. The correct hypothesis are: Ho: p = 0.45 Ha: p does not equal 0.45

27. The average yearly income of dentists is 110,000. A sample of 81 dentists showed an average yearly income of 120,000. Assume that the standard deviation of the population is $36,000 and that the distribution is approximately normal. The p-value for testing if the average has increased in 2009 is found to be 0.0062. Which of the following is true?

a. The p-value cannot be interpreted since alpha is unknown
b. The p-value can be interpreted as the probability of obtaining a sample with a z value larger than 2.5 if the average income has not changed
c. The probability that the sample mean is greater than 110,000 is only 0.0062
d. None of the above answers

28. In the past, the average age of employees of a large firm has been 40 years. In order to determine whether there has been an increase in the average age of all employees a sample of 64 employees was selected. The level of alpha is 0.05. Which of the following is true?

a. the p-value is 0.05
b. the maximum allowable probability of type two error is 0.05
c. the probability of rejecting the hypothesis that the average age has not increased when it is true will not exceed 0.05.
d. None of the above answers is correct

29. The following information regarding a dependent variable Y and an independent variable X is based on 4 pairs of observations. The intercept of the regression function is:

$$\sum x = 12 \quad \sum y = 23 \quad \sum (x-\bar{x})^2 = 12 \quad \sum (x-\bar{x})(y-\bar{y}) = -9$$

a. 8
b. 3.5
c. .715
d. None of the above answers is correct

30. In a university 40% of students live in dorms. A random sample of 80 students is selected for a study. The probability that the sample proportion is between 0.3 and 0.5 is:

a. .4664
b. .9328
c. .0336
d. None of the above

31. The average life of a printer is 3.5 years with a standard deviation of 2 years. A random sample of 49 printers was tested. What is the probability that the sample mean will be between 4 and 4.2 years?

a. between 0.05 and 0.025
b. 0.0472
c. 0.033
d. None of the above

32. In a regression analysis situation, the standard error of the slope is:

a. a measure of the variation in the estimated regression slope from sample to sample
b. equal to the square root of the standard error of the estimate
c. a measure of the amount of change in y for a one unit change in x
d. None of the above answers is correct

33. If we change a 95% confidence interval estimate to a 99% confidence interval estimate we would expect:

a. The width of the interval to increase because we become more confident
b. The width of the interval to decrease because we become more confident
c. The with of the interval to remain unchanged
d. None of the above answers are correct

34. Which of the following statements is true?

a. if we selected several random samples of the same size from a normally distributed population and we compute the sample means, they must all have the same values
b. If we select random samles of the same size from a normally distributed populations, the expected values of the sample means will be different
c. If we select several random samples of the same size from a normally distributed population, the sample means will have different standard deviations
d. None of the above is correct