THE SOCIETY OF ACCOUNTING EDUCATION

CERTIFIED FINANCIAL & MANAGEMENT ACCOUNTANT MEMBERSHIP PROGRAM

Model Paper for Course : Business Statistics & Mathematics
Course Code: OL-03
Level: Operational Level

1. Which statement is correct?
    a) Class standing (freshman, sophomore, and junior, senior) would be ratio data.
    b) Sampling without replacement introduces bias in our estimates.
    c) In a random number table, every digit is equally likely to occur.
    d) Focus groups usually work best without a trained moderator.

2. Which variable is least likely to be regarded as ratio data?
    a) Length of time required for a randomly-chosen vehicle to cross a toll bridge (minutes).
    b) Weight of a randomly-chosen casting in a foundry (kilograms).
    c) Number of fatalities in a randomly-chosen airline disaster (persons).
    d) Supervisor's rating of a randomly-chosen employee's performance (Likert scale).

3. Which of the following is quantitative data?
    a) Your gender.
    b) The brand of cell phone you own.
    c) Whether or not you have an American Express card.
    d) **The fuel economy (MPG) of your car.**

4. Your rating of the food served on your most recent airline flight (using a scale of 0 =gross, 1 = decent, 2 = yummy) is _____ data.
    a) Nominal
    b) Ordinal
    c) Interval
    d) Ratio

5. Which statement is correct?
    a) Likert scales are interval only if scale distances are meaningful.
    b) Cross-sectional data are measured over time (e.g., by year, month, etc.).
    c) A census is preferable to a sample for most business problems.
    d) Stratified samples are usually cheaper than other methods.

6. Which is most nearly correct regarding sampling error?
    a) It can be eliminated by increasing the sample size.

b) It can be eliminated by using Excel's =RANDBETWEEN function.
c) It can be eliminated by utilizing systematic random sampling.
d) It cannot be eliminated because of the nature of sampling.

7. A hospital selects thirty patient folders from a filing cabinet containing 812 patientfolders by choosing every 27th patient folder. Which sampling method is this?
   a) Simple random sample.
   b) Systematic sample.
   c) Stratified sample.
   d) Cluster sample.

8. From its 32 regions, the Federal Aviation Administration randomly selects 5 regions, andthen randomly audits 20 departing commercial flights in each region for compliance with legalfuel and weight requirements. This most nearly resembles
   a) Simple random sampling.
   b) Systematic random sampling.
   c) Two-stage cluster sampling.
   d) Judgment sampling

9. Which statement is false?
   a) Random dialing phone surveys have low response and are poorly targeted.
   b) Selection bias means that many respondents dislike the interviewer.
   c) Simple random sampling requires a list of the population.
   d) Web surveys are economical but suffer from non-response bias.

10. Professor Hardtack chose a sample of 7 students from his statistics class of 35 students bypicking every student who was wearing red that day. Which kind of sample is this?
    a) Simple random sample.
    b) Judgment sample.
    c) Systematic sample.
    d) Convenience sample.

11. W. Edwards Deming
    a) Taught quality control techniques to Japanesecompanies during the 1950's.
    b) Would have been very influential but for his veryshort life.
    c) Invented control charts and proposed the ISO 9000standard.
    d) Suggested that most quality problems could be blamedon labor.

12. Which is an appropriate step in continuous qualityimprovement?
    a) Taking measurements on a variable and keeping carefulrecords.
    b) Posting quality banners or company flags where theyare visible to all.
    c) Castigating the lazy employees for their shoddyworkmanship.
    d) Sending employees to Motivation Camp taught byexpensive consultants.

13. Process control charts were an innovation attributedto
    a) Deming in the 1950's.

b) Shewhart in the 1920's.
c) Westinghouse in the 1960's.
d) Pacioli in the 1490's.

14. Likely reasons for inaccurate control limits wouldinclude which of the following?
    a) The engineering parameter for variance is unknown.
    b) The engineers were underpaid for their work.
    c) There was insufficient preliminary sampling.
    d) Process variation was not zero, as expected.

15. Which is not a characteristic of a p-chart?
    a) It shows the number of defects per item beinginspected.
    b) It measures the fraction of non-conforming items in asample.
    c) It is based on the binomial distribution (or itsnormal approximation).
    d) It will have varying control limits if the sample sizeis changing.

16. Which is not a tool of statistical quality control?
    a) Fishbone diagram.
    b) Pareto chart.
    c) Attribute control chart.
    d) Deming chart.

17. If the subgroup size is n = 4 and the processparameters are $\mu = 2.75$ and $\sigma = .044$, the control limits forthe chart will be:
    a) LCL = 2.684, UCL = 2.816
    b) LCL = 2.728, UCL = 2.772
    c) LCL = 2.618, UCL = 2.882

18. Find the Cpk index for a process with USL = 550, LSL =540, $\mu = 543$, and $\sigma = 0.75$.
    a) 1.33
    b) 2.22
    c) 1.25
    d) 1.75

19. Which nonparametric test is analogous to a parametric t-test for independent samplemeans?
    a) Wald-Wolfowitz test.
    b) Wilcoxon signed rank test.
    c) Mann-Whitney test.
    d) Kruskal-Wallis test.

20. Which nonparametric test is analogous to a one-factor ANOVA?
    a) Kruskal-Wallis test.
    b) Friedman test.
    c) Mann-Whitney test.
    d) Wilcoxon signed rank test..

21. Which nonparametric test is analogous to a parametric one-sample t-test for differences in paired data?
    a) Wald-Wolfowitz test.
    b) **Wilcoxon signed rank test**.
    c) Mann-Whitney test.
    d) Kruskal-Wallis test.

22. Which parametric test resembles the nonparametric Spearman's rank test?
    a) The t-test of a correlation coefficient.
    b) The t-test of two sample means.
    c) The t-test of one sample mean.
    d) The one factor ANOVA.

23. Which is not true of the one-sample runs test?
    a) It is also called the Wald-Wolfowitz test after its inventors.
    b) Its purpose is to detect non-randomness.
    c) It cannot be applied to sequential binary data.
    d) It is similar to test for autocorrelation.

24. Which nonparametric test is used to compare one sample median with a benchmark?
    a) Wald-Wolfowitz test.
    b) Wilcoxon signed rank test.
    c) Mann-Whitney test.
    d) Kruskal-Wallis test.

25. The critical value in chi-square goodness-of- fit test depends on
    a) The number r of categories.
    b) The normality of the population.
    c) The value of the test statistic.
    d) All of the above.

26. For a chi-square test, a 4×5 contingency table will have how many degrees of freedom?
    a) 12
    b) 8
    c) 9
    d) 6

27. We sometimes combine two categories in a chi-square test if
    a) The sample size is less than 30.
    b) Their observed frequencies are below 5.
    c) Their expected frequencies are below5.
    d) The p-value is less than α.

28. The number of cars waiting at a certain residential neighborhood stop light is observed at6:00 AM on 160 different days. The observed sample frequencies are:

Number of Cars Waiting 0 1 2 3
Observed Frequency 10 65 71 14
Under the null hypothesis of a uniformdistribution, the expected number of days we would see 0cars is

a) 10
b) 20
c) 30
d) 40

29. A chi-square goodness of fit test for a normal distribution used 40 observations, with themean and standard deviation were estimated from the sample. The test used six categories, allwith expected frequencies greater than 5. We would use how many degrees of freedom inlooking up the critical value for the test?

a) 39
b) 37
c) 5
d) 3

30. A computer analysis reveals that the best- fitting trend model is Yt = 4.12 e0.987 t. Thetrend was fitted using year-end common stock prices for Melodic Kortholt Outlet for the last sixyears. The R2 is 0.8571. Which conclusion is not correct?

a) The absolute annual growth (in dollars per share) is increasing.
b) Few investments could match the astounding growth rate.
c) At the end of year 3 the stock price would be nearly $80.
d) The exponential model is inappropriate for financial data.

31. If we fit a linear trend to 10 observations on time series data that are growing exponentially, then it is most likely that

a) The fitted trend will be too high at t = 1 and t = 10.
b) The fitted trend will be too low in the middle.
c) The forecasts (if extrapolated) will be too low.

32. Suppose the estimated quadratic model Yt = 500 + 20 t - t2 is the best- fitting trend ofsales of XYZ Inc. using data for the past twenty years (t = 1, 2, ... , 20). Which statement isincorrect?

a) Sales are increasing by about 20 units per year.
b) The turning point would be in period 10.
c) Latest year sales are no better than in year zero.
d) The trend was higher in year 10 than in year 20.

33. Which is a time series?

a) The M1 component of the U.S. money supply (n = 20 quarters).
b) The unemployment rates for the U.S. states (n = 50 states).
c) The Gross Domestic Product for the E.U. members (n = 15 nations).
d) The inflation rate for housing in U.S. metropolitan areas (n = 46 cities).

34. Which is not an additive component of a time series?
    a) Trend.
    b) Seasonal.
    c) Irregular.
    d) Periodicity.

35. The fitted annual sales trend is Yt = 187.3 e .047 t. On average, sales are
    a) Rising by an increasing absolute amount each year.
    b) Rising by a declining absolute amount each year.
    c) Falling by a declining absolute amount each year.
    d) Falling by an increasing absolute amount each year

36. The fitted annual sales trend is Yt = 187.3 e .047 t. The sales forecast for year 5 would be
    a) 236.9
    b) 178.7
    c) 168.2
    d) 148.1

37. Concerning a multiplicative seasonal index for monthly data, which statement isincorrect?
    a) An index value of 1.000 indicates no seasonal deviation from trend.
    b) The estimated indexes are adjusted so they always sum to 12.
    c) To make forecasts, we divide the projected trend by each month's index.
    d) They are obtained by the process called decomposition of a time series.

38. Which statement is correct for a simple index?
    a) For the base year, the index is set to 0.000.
    b) We cannot use index numbers to compare two time series measured in different units.
    c) The simple relative index for period t = 5 is calculated as Y5/Y1.
    d) Weighted index numbers have few practical applications due to their complexity.

39. Which of the following is not a characteristic of the F distribution?
    a) It is a continuous distribution.
    b) The test statistic Fcalc can never be negative.
    c) Its degrees of freedom vary, depending on α.
    d) It is used to test for overall significance in a regression.

40. The unexplained sum of squares measures variation in the dependent variable about
    a) The mean of the Y values.
    b) The estimated Y values.
    c) The mean of the X values.
    d) The Y- intercept.

41. Which of the following is most useful in checking the normality assumption of the errorsin a regression model?

a) The t statistic for each coefficient.
b) The leverage statistic for each residual.
c) The histogram of all the residuals.
d) The VIF statistic for each predictor.

42. A multiple regression analysis with two independent variables yielded the followingresults: SS (Total) = 798, SS (Regression) =738, SS (Error) = 60. The multiple correlationcoefficients is
    a) 0.2742
    b) 0.0752
    c) 0.9248
    d) 0.9617

43. In a least squares multiple regression all of the following are true regarding residualsexcept
    a) They may be used to test for multicollinearity.
    b) They are differences between observed and estimated values of Y.
    c) Their sum will always equal zero even if there are outliers.
    d) They may be used to detect heteroscedasticity.

44. Heteroscedasticity means that we have
    a) Multi-co linearity among the predictors.
    b) Nonconstant variation in the residuals.
    c) Lack of independence in successive residuals.
    d) More than one of the above.

45. If you re–run a regression, omitting a predictor X5, which would be unlikely?
    a) The new R2 will decline if X5 was a relevant predictor.
    b) The new standard error will increase if X5 was a relevant predictor.
    c) The remaining estimated β's will change if X5 was collinear with other predictors.
    d) The numerator degrees of freedom for the F test will increase.

46. A fitted multiple regression equation is Y = 12 + 3X1 - 5X2 + 7X3 + 2X4. When X1increases 2 units and X2 increases 2 units as well, while X3 and X4 remain unchanged, whatchange would you expect in your estimate of Y?
    a) Decrease by 2.
    b) Decrease by 4.
    c) Increase by 4.

47. A test is conducted in 22 cities to see if giving away free transit system maps willincrease the number of bus riders. In a regression analysis, the dependent variable Y is theincrease in bus riders (in thousands of persons) from the start of the test until its conclusion. Theindependent variables are X1 = the number (in thousands) of free maps distributed, and a binaryvariable X2 = 1 if city has free downtown parking, 0 otherwise. The estimated regressionequation is in city 3, the observed Y value is 7.3 with X1 = 140 and X2 = 0. The residual forcity 3 (in thousands) is:

a) 6.15
b) 1.15
c) 4.83
d) 1.57185

48. The sample coefficient of correlation does not have which property?
    a) It can range from -1.00 up to +1.00.
    b) It is also sometimes called Pearson's r.
    c) It assumes that Y is the dependent variable.
    d) It is tested for significance using a t-test.

49. Which is not true of the coefficient of determination?
    a) It is the square of the coefficient of correlation.
    b) It is negative when there is an inverse relationship between X and Y.
    c) It reports the percent of the variation in Y explained by X.
    d) It is calculated using sums of squares (SSR, SSE, SST).

50. If the fitted regression is Y = 3.5 + 2.1X (R2 = .25, n = 25) it is incorrect to conclude that
    a) Y increases 2.1 percent for a 1 percent increase in X.
    b) The estimated regression line crosses the Y axis at 3.5.
    c) The correlation coefficient must be positive.
    d) The value of the correlation coefficient must be 0.25.

51. In a bivariate regression with 25 observations, which statement is most nearly correct?
    a) A residual whose value is ei = 4,227 would be considered an outlier.
    b) Any leverage statistic of 0.16 or more would indicate high leverage.
    c) Standardizing the residuals will eliminate heteroscedasticity.
    d) Non-normal residuals imply biased coefficient estimates, a major problem.

52. William used a sample of 68 U.S. cities to estimate the relationship between Crime(annual property crimes per 100,000 persons) and Income (median income per capita). Hisestimated regression equation was Crime = 428 + 0.050 Income. Fromthis information, we canconclude that
    a) The slope does not differ significantly from zero at $\alpha = .05$.
    b) Crime tends to create additional income in a city.
    c) Wealthy individuals tend to commit more crimes, on average.
    d) The intercept is irrelevant since zero median income is unobservable.

53. William used a sample of 68 U.S. cities to estimate the relationship between Crime(annual property crimes per 100,000 persons) and Income (median income per capita, in dollars).Her estimated regression equation was Crime = 428 + 0.050 Income. If Income decreases by1000 we would expect that Crime will
    a) Increase by 428.
    b) Increase by 50.
    c) Increase by 500.
    d) Remain unchanged.

54. In a bivariate regression Y = b0 + b1X where Y = number of robberies in city (thousandsof robberies), X = size of police force in city (thousands of police), and n = 45 randomlychosen U.S. cities in 2007, we would be least likely to see which violation?
    a) Autocorrelated residuals (because this is time series data).
    b) Heteroscedastic residuals (because we are using totals uncorrected for city size).
    c) Non-normal residuals (because a few larger cities may skew the residuals).

55. Which statement is not correct?
    a) Spurious correlation can often be reduced by expressing X and Y in per capita terms.
    b) Autocorrelation is mainly a concern if we are using time-series data.
    c) Heteroscedastic residuals have the same variance for any value of X.
    d) Standardized residuals make it easier to identify outliers.

56. In a simple (bivariate) regression with n = 25, the critical value for a two-tailed test forzero slope using $\alpha = .05$ is:
    a) 1.714
    b) 2.069
    c) 1.960
    d) 2.064

57. Weekly sales of diet coke at each of twelve Target stores are recorded before and afterinstalling a new eye-catching display. To determine if the display is effective in increasing sales,what type of statistical test would you expect to perform?
    a) Comparison of means using an independent sample t-test.
    b) Comparison of means using a paired t-test.
    c) Comparison of means using a z-test.

58. Carver Memorial Hospital's surgeons have a new procedure that they think will decreasethe time to performan appendectomy. A sample of 8 appendectomies using the old method had amean of 38 minutes with a variance of 36 minutes, while a sample of 10 appendectomies usingthe experimental method had a mean of 29 minutes with a variance of 16 minutes. For a right-tailtest of means (assume equal variances) the critical value for $\alpha = .10$ is
    a) 1.746
    b) 1.337
    c) 2.120
    d) 2.754

59. Carver Memorial Hospital's surgeons have a new procedure that they think will decreasethe time to performan appendectomy. A sample of 8 appendectomies using the old method had amean of 38 minutes with a variance of 36 minutes, while a sample of 10 appendectomies usingthe experimental method had a mean of 29 minutes with a variance of 16 minutes. For a right-tailtest of means (assume equal variances) the test statistic is
    a) 2.365

b) 3.814
c) 3.000
d) 1.895

60. Carver Memorial Hospital's surgeons have a new procedure that they think will decreasethe time to performan appendectomy. A sample of 8 appendectomies using the old method had avariance of 36 minutes, while a sample of 10 appendectomies using the experimental method hada variance of 16 minutes. In a two-tailed test for equal variances, the critical values at $\alpha = .10$ are
    a) 3.73 and 0.228
    b) 2.51 and 3.67
    c) 3.07 and 0.398
    d) 3.29 and 0.272

61. In a test of a new surgical procedure, the five most respected surgeonsin FlatBroke Township were invited to CarverHospital. Each surgeon was assigned two patients of the same age, gender, and overall health. One patient was operated upon in the old way, and the other in the new way. Both procedures are considered equally safe. The time (in minutes) tocomplete each procedure is shown:
    SurgeonAllen Bob Chloe Daphne Edgar
    Old Way 36 55 28 40 62
    New Way 31 45 28 35 57
    In a right-tail test for a difference of means at $\alpha = .05$, the critical value is
    a) 3.162, paired t-test
    b) 2.132, paired t-test
    c) 1.645, independent samples t-test
    d) 2.776, independent samples t-test

62. In a test of a new surgical procedure, the five most respected surgeonsin FlatBroke Township were invited to CarverHospital. Each surgeon was assigned two patients of thesame age, gender, and overall health. One patient was operated upon in the old way, and theother in the new way. Both procedures are considered equally safe. The time (in minutes) tocomplete each procedure is shown.
    SurgeonAllen BobChloe Daphne Edgar
    Old Way 36 55 28 40 62
    New Way 31 45 28 35 57
    In a right-tailed test for a difference of means, the test statistic is
    a) 3.162
    b) 1.645
    c) 1.860
    d) 2.132

63. The Board of Surgeons recommends a postoperative examination six months after aprostatectomy. In a sample from the records of Cutter Memorial Hospital, follow-up exams were givenin 90 out of 200 cases. In a sample of records from Paymor Hospital,

follow-up exams were given in110 out of 200 cases. In a left-tailed test for equality of proportions, the test statistic is

a) -1.96
b) -2.58
c) -2.00
d) -3.47

64. The Board of Surgeons recommends a postoperative examination six months after aprostatectomy. In a sample from the records of Cutter Memorial Hospital, follow-up exams were givenin 90 out of 200 cases. In a sample of records from Paymor Hospital, follow-up exams were given in110 out of 200 cases. In a left-tailed test for equality of proportions the p-value is

a) .9772
b) .4772
c) .0228
d) .0014

65. Given H0: $\mu \geq 18$ and H1: $\mu < 18$, we would commit Type I error if we

a) Conclude that $\mu \geq 18$ when the truth is that $\mu < 18$.
b) Conclude that $\mu < 18$when the truth is that $\mu \geq 18$.
c) Fail to reject $\mu \geq 18$ when the truth is that $\mu < 18$.

66. Which is not true of p-values?

a) When they are small, w e want to reject H0.
b) Theymust be specified before the sample is taken.
c) They show the chance of Type I error if we reject H0.

67. Dullco manufacturing claims that its alkaline batteries last at least forty hours on average in a certain type of portable CDplayer. But tests on a random sample of 18 batteries from a day's large production run showed a mean battery life of only 37.8hours with a standard deviation of 5.4 hours. To test DullCo's hypothesis, the test statistic is

a) -1.980
b) -1.728
c) -2.101
d) -1.960

68. Last year, 10 percent of all teenagers owned an iPhone. This year, a sample of 260 randomly chosen teenagers showed that39 owned an iPhone. The test statistic to find out whether the percent has risen is

a) 2.687
b) 2.758
c) .0256
d) 2.258

69. Last year, 10 percent of all teenagers purchased a new iPhone. This year, a sample of 260 randomly chosen teenagersshowed that 39 had purchased a new iPhone. To test whether the percent has risen, the critical value at $\alpha = .05$ is
    a) 1.686
    b) 1.655
    c) 1.645
    d) 1.960

70. Last year, 10 percent of all teenagers purchased a new iPhone. This year, a sample of 260 randomly chosen teenagersshowed that 39 had purchased a new iPhone. To test whether the percent has risen, the p-value is
    a) .0501
    b) .0314
    c) .0492
    d) .0036

71. Assuming that other factors remain the same, which of the following statements is most nearly correct for a t-test of a mean?
    a) For a given α, the critical value of Student's t is smaller if n is smaller.
    b) If tcalc = 1.482 with n = 22, we get a clear-cut rejection in a right-tailed test at $\alpha = .05$.
    c) Rejecting H0: $\mu = 75$ in a two-tailed test implies rejection in a one-tailed test at the same α.
    d) A calculated p-value of 0.13 would lead us to reject the null hypothesis at $\alpha = 0.10$.

72. John rejected a null hypothesis in a right-tailed test f or a mean at $\alpha = .025$ because his critical t value w as 2.000 and hiscalculated t value was 2.345. We can be sure that
    a) John did not commit Type I error.
    b) John did not commit Type II error.
    c) John committed neither Type I nor Type II error.
    d) None of the above can definitely be concluded.

73. In a right-tail test, a statistician came up with a z test statistic of 1.470. What is the p-value?
    a) .4292
    b) .0708
    c) .0874
    d) .0301

74. In a right-tailed test of hypothesis for a population mean with 13 degrees of freedom, the value of the test statistic was 1.863.The p-value is
    a) Less than .025.
    b) Between .025 and .05.
    c) Between .05 and .10
    d) Greater than .10

75. 6 Concerning confidence intervals, which statement is most nearly correct?
    a) We should use z instead of t when n is large.
    b) **We use the t distribution when σ is unknown**.
    c) Using the t distribution instead of z narrows the confidence interval.

76. The standard error of the mean decreases if
    a) The sample size decreases.
    b) The standard deviation increases, provided that n is constant.
    c) The standard deviation decreases or if n increases.
    d) The population size decreases.

77. Which statement is incorrect? Explain.
    a) If p = .50 and n = 64 the estimated standard error of the sample proportion is .025.
    b) In a sample size calculation f or estimating π it is conservative to assume π = .50.
    c) If n = 250 and p = .07 it is safe to assume normality in a confidence interval forπ.

78. The owner of Limp Pines Resort wanted to know the average age of its clients. A random sample of 25 tourists is taken. Itshows a mean age of 46 years with a standard deviation of 5 years. The width of a 98 percent CI for the true mean client age isapproximately
    a) ± 2.06 years.
    b) ± 2.33 years.
    c) ± 2.49 years.
    d) ± 2.79 years.

79. A random sample of 16 ATM transactions at the Last National Bank of Flatrock revealed a mean transaction time of 2.8minutes with a standard deviation of 1.2 minutes. The width (in minutes) of the 95% confidence interval for the true meantransaction time is
    a) ± 0.639
    b) ± 0.588
    c) ± 0.300
    d) ± 2.131

80. To estimate the average annual expenses of students on books and class materials a sample of size 36 is taken. The meanis $850 and the standard deviation is $54. A 99% confidence interval for the population mean is
    a) $823.72 to $876.28
    b) $826.82 to $873.18
    c) $831.73 to $868.27
    d) $825.48 to $874.52

81. A poll showed that 48 out of 120 randomly chosen graduates of California medical schools last year intended to specialize infamily practice. What is the width of a 90% confidence interval for the proportion that plan to specialize in family practice?
    a) ± .04472

b) ± .07357
c) ± .08765
d) ± .00329

82. In a random sample of 810 women employees, it is found that 81 would prefer working for a female boss. The width of the95% confidence interval for the proportion of women who prefer a female boss is
    a) ± .0288
    b) ± .0105
    c) ± .0196
    d) ± .0207

83. Jolly Blue Giant Health Insurance (JBGHI) is concerned about rising lab test costs and would like to know what proportion ofthe positive lab tests for prostate cancer are actually proven correct through subsequent biopsy. JBGHI demands a sample large enough to ensure an error of ± 2% with 90% confidence. What is the necessary sample size?
    a) 2,401
    b) 1,692
    c) 1,604
    d) 609

84. A financial institution wishes to estimate the mean balances owed by its credit card customers. The population standarddeviation is estimated to be $300. If a 98 percent confidence interval is used and an interval of ±$75 is desired, how manycardholders should be sampled?
    a) 3382
    b) 62
    c) 629
    d) 87

85. Excel's =RAND() function produces random numbers that are uniformly distributedbetween 0 and 1. The standard deviation of this distribution is approximately
    a) .5000
    b) .2500
    c) .3333
    d) .2887

86. The variable Z has a standard normal distribution. The probability $P(1.25 \leq Z \leq 2.17)$ is
    a) 0.0906
    b) 0.9200
    c) 0.4700
    d) 0.4850

87. The variable Z has a standard normal distribution. The probability $P(Z \leq -1.37)$ is equalto
    a) 0.5853

b) 0.9147
c) 0.4147
d) 0.0853

88. Assume that X is normally distributed with a mean $\mu = \$64$. Given that $P(X \geq \$75) = 0.2981$, we can calculate that the standard deviation of X is approximately
    a) $20.75
    b) $13.17
    c) $5.83
    d) $7.05

89. The length of brook trout caught in a certain Colorado stream has a mean of 14 inchesand a standard deviation of 3 inches. What proportion of these trout will be between 12and 18 inches?
    a) .6568
    b) .6826
    c) .2486
    d) .4082

90. The length of brook trout caught in a certain Colorado stream has a mean of 14 inchesand a standard deviation of 3 inches. The first quartile for the lengths of brook troutwould be
    a) 16.01 inches.
    b) 11.00 inches.
    c) 11.98 inches.
    d) 8.16 inches.

91. The length of brook trout caught in a certain Colorado stream has a mean of 14 inchesand a standard deviation of 3 inches. What lower limit should the State GameCommission set on length, if it is desired that 80 per cent of the catch may be kept byfisherpersons?
    a) 12.80 inches
    b) 11.48 inches
    c) 12.4l inches
    d) 12.00 inches

92. If freeway speeds are normally distributed with a mean of $\mu = 70$ mph and $\sigma = 7$ mph,about what percent of cars will exceed 78 mph?
    a) 34.1%
    b) 12.7%
    c) 15.8%
    d) 87.3%

93. A software developer makes 200 phone calls to its current customers. There is an 8percent chance of reaching a given customer (instead of a busy signal, no answer, oranswering machine). The approximate normal probability of reaching at least 15customers is
    a) .4492

b) .5000
c) .6517
d) .4981

94. Which statement is incorrect?
a) The triangular distribution always has a single mode.
b) The mean of the triangular distribution is (a + b + c)/3.
c) The triangular distribution is always symmetric.

95. If arrivals follow a Poisson distribution with mean 1.2 arrivals per minute, find the 75th percentile of waiting times (i.e., 75 percent below).
a) 1.155 minutes (69.3 seconds)
b) 0.240 minutes (14.4 seconds)
c) 1.919 minutes (115.1 seconds)

96. Independent events A and B would be consistent with which of the following statements:
a) P (A) = .5, P (B) = .4, P (A ∩ B) = .3
b) P (A) = .4, P (B) = .3, P (A ∩ B) = .5
c) P (A) = .3, P (B) = .5, P (A ∩ B) = .4
d) P (A) = .4, P (B) = .5, P(A ∩ B) = .2

97. If P(A|B) = 0.40 and P(B) = 0.30, find P(A ∩ B).
a) .171
b) .525
c) .571
d) .120

98. Two events are complementary (i.e., they are complements) if
a) The sum of their probabilities equals one.
b) They are disjoint and their probabilities sum to one.
c) The joint probability of the two events equals one.
d) They are independent events with equal probabilities.

99. If each of two independent file servers has a reliability of 93% and either alone can run the web site, then the overall web siteavailability is
a) 0.8649
b) 0.9300
c) 0.9522
d) 0.9951

100. The manager of PayALot Drug Store knows that 30% of the customers entering the store buy prescription drugs, 60% buy over-thecounterdrugs, and 18% buy both types of drugs. What is the probability that a randomly selected customer will buy either one or theother of these two types of drugs?
a) .50
b) .90

c) .72
d) .30

101. Given the information below, find P(V).

Cell Phone Service Provider

County	Sprint (S)	AT&T (A)	Verizon(V)	Row Total
Macomb (M)	17	25	8	50
Oakland (O)	19	38	13	70
Wayne (W)	24	37	19	80
Col Total	60	100	40	200

a) .20
b) .40
c) .50
d) .80

102. Given the information below find P(V |W).

Cell Phone Service Provider

County	Sprint (S)	AT&T (A)	Verizon(V)	Row Total
Macomb (M)	17	25	8	50
Oakland (O)	19	38	13	70
Wayne (W)	24	37	19	80
Col Total	60	100	40	200

a) .2000
b) .2375
c) .0950
d) .4000

103. Given the information below, find P(S ∩ W).

Cell Phone Service Provider

County	Sprint (S)	AT&T (A)	Verizon(V)	Row Total
Macomb (M)	17	25	8	50
Oakland (O)	19	38	13	70
Wayne (W)	24	37	19	80
Col Total	60	100	40	200

a) .12
b) .30
c) .40
d) .58

104. A discrete probability distribution
a) Assigns a probability to each value of the random variable.
b) Can assume any value between -1 and +1.
c) Is appropriate when the probability of success is an integer.

105. Which statement is incorrect?
a) The Poisson distribution is always skewed right.

b) The binomial distribution may be skewed left or right.
c) The uniform distribution is never skewed.
d) The Bernoulli distribution has two equally likely outcomes.

106. Historically, 2% of the stray dogs in the city of Southfield are unlicensed. On a randomlychosenday, the Southfield city animal control officer picks up 7 stray dogs. What is theprobability that at least one will be unlicensed?
a) .8681
b) .1319
c) .3670
d) .1240

107. In a randomly-chosen week, which probability model would you use to describe thenumber of accidents at the intersection of two streets?
a) Uniform.
b) Binomial.
c) Poisson.
d) Geometric.

108. Which probability model would you use to describe the number of damaged printersin a random sample of 12 printers taken from a shipment of 70 printers that contains 6damaged printers?
a) Poisson.
b) Hypergeometric.
c) Binomial.
d) Geometric.

109. Consider the following probability distribution of the random variable X:
X P (X)
100 .10
150 .20
200 .30
250 .30
300 .10
1.00
The expected value of X is:
a) 175
b) 150
c) 200
d) 205

110. A carnival has a game of chance: a fair coin is tossed. If it lands heads you win $1.00and if it lands tails you lose $0.50. How much should a ticket to play this game cost ifthe carnival wants to break even?
a) $.25
b) $.50

c) $.75
d) $1.00

111. A random variable X is distributed binomially with n = 8 and $\pi = 0.70$. The standarddeviation of the variable X is approximately
a) 0.458
b) 2.828
c) 1.680
d) 1.296

112. In Quebec, 90 percent of the population subscribes to the Roman Catholic religion. In arandom sample of 8 Quebecois find the probability that the sample contains at least fiveRoman Catholics.
a) .0050
b) .0331
c) .9950
d) .9619

113. On average, a major earthquake (Richter scale 6.0 or above) occurs 3 times adecade in a certainCalifornia county. Find the probability that at least one major earthquakewill occur within the next decade.
a) .9810
b) .0498
c) .1994
d) .9502

114. If the probability of success is .25, what is the probability of obtaining the first successwithin the first 3 trials?
a) .4218
b) .5781
c) .1406

115. Which is a characteristic of the mean as a measure of central tendency?
a) Deviations around the mean may not sum to zero if there are outliers.
b) The mode is more useful than the mean when data are continuous.
c) The mean utilizes all the information in a sample.
d) The mean usually is the same as the median in business data.

116. Which statement is false? Explain.
a) If $\mu = 52$ and $\sigma = 15$, then X = 81 would be an outlier.
b) If the data are from a normal population, about 68% of the X values will be within $\mu \pm \sigma$.
c) If $\mu = 640$ and $\sigma = 128$ then the coefficient of variation is 20 percent.

117. Patient survival times after a certain type of surgery have a very right-skewed distribution due toa few high outliers. Consequently, which statement is most likely to be correct?

a) Median > midrange.
b) Mean < median.
c) Mean > midrange.
d) Mean > trimmed mean.

118. If Q1 = 150 and Q3 = 250, the upper fences (inner and outer) are:

a) 450 and 600
b) 350 and 450.
c) 400 and 550
d) Impossible to determine without knowing n.

119. So far this year, stock A has had a mean price of $6.58 per share with a standard deviation of$1.88, while stock B has had a mean price of $10.57 per share with a standard deviation of$3.02. Which stock is more volatile?

a) Stock A
b) Stock B
c) They are the same.

120. Which of the following statements is likely to describe the incomes of 50 randomly-chosentaxpayers in California?

a) The median income would probably be near the mean.
b) **The mid range would be a robust measure of central tendency**.
c) The sum of squared deviations about the mean would be negative.
d) Outliers in either tail would be equally likely.

121. Twelve randomly-chosen students were asked how many times they had missed class during acertain semester, with this result: 2, 1, 5, 1, 1, 3, 4, 3, 1, 1, 5, 18. For this sample, the geometricmean is

a) 2.376
b) 2.158
c) 1.545
d) Impossible to calculate.

122. Twelve randomly-chosen students were asked how many times they had missed class during acertain semester, with this result: 2, 1, 5, 1, 1, 3, 4, 3, 1, 1, 5, 18. For this sample, the median is

a) 2
b) 3
c) 3.5
d) 2.5

123. Twelve randomly-chosen students were asked how many times they had missed class during acertain semester, with this result: 2, 1, 5, 1, 1, 3, 4, 3, 1, 1, 5, 18. For this sample, which measureof central tendency is least representative of the "typical" student?

a) Mean.
b) Median.
c) Mode.
d) Midrange.

124. Twelve randomly-chosen students were asked how many times they had missed class during acertain semester, with this result: 2, 1, 5, 1, 1, 3, 4, 3, 1, 1, 5, 18. For this sample, the standarddeviation is approximately

a) 4.75
b) 4.55
c) 3.03
d) 3.75

125. Which is not a criterion for judging a frequency distribution?

a) The number of bins is approximately consistent with Sturges' Rule.
b) The bin limits are often based on aesthetic judgment of "appropriate" classes.
c) The lowest and highest bin limits must cover the data range exactly.
d) The bins are defined so there is no ambiguity about "cutpoints" between bins.

126. The _____can be used to differentiate the "significant few" causes ofquality problems from the "trivial many" causes of quality problems.

a) Histogram.
b) Scatter plot.
c) Pareto chart.
d) Dot plot.

127. Histograms usually do not reveal the

a) Exact data range.
b) Modal class(es).
c) Degree of skewness.
d) Frequencies within bins.

128. Which is most nearly correct concerning pictograms?

a) They are attractive to statisticians, but not to the general media.
b) They are basically line graphs rather than pictures.
c) They are attention-getting and interesting to readers.
d) They are included in statistical Excel add-ins (e.g., MegaStat).

129. Which is not a tip for effective line charts?

a) Line charts are better than bar charts when displaying more than one timeseries.
b) Non-zero origin is sometimes acceptable to show sufficient detail.
c) Omit data markers (e.g., squares, triangles) if the series has only a fewdata values.

d) Use light grid lines so they don't dominate the graph.

130. Which data would be suitable for a pie chart?
a) Whirlpool Corporation's sales revenue for the last five years.
b) Oxnard University student category (undergraduate, masters, doctoral).
c) Average SAT scores for entering freshmen at 10 major U.S. universities.
d) Price-earnings ratios for ten common stocks.

131. Which is not considered a deceptive graphical technique?
a) Nonzero origin.
b) Elastic graph proportions.
c) Dramatic title.
d) Axis demarcations.

132. This histogram shows Chris's golf scores in his last 77 rounds at Devil's Ridge. Whichis not a correct statement?
a) The number of bins is consistent with Sturges' Rule
b) The histogram has a noticeable bimodal shape.
c) The modal class is 78 < 80.
d) About 19% of his scores are in the interval 74 < 76.

133. Which is a not characteristic of using a log scale to display time series data?
a) A log scale helps to compare changes in two time series of dissimilarmagnitude.
b) General business audiences find it easier to interpret a log scale.
c) Equal distances represent equal ratios.

134. "Bob must be rich. He's a lawyer, and lawyers make lots of money." This statement best illustrates which fallacy?
a) Using poor survey methods.
b) Confusing significance with importance.
c) Unconscious bias.
d) Generalizing from an average to an individual.

135. Which is not an ethical obligation of a statistician? Explain.
a) To know and follow accepted procedures.
b) To ensure data integrity and accurate calculations.
c) To support client wishes in drawing conclusions from the data.
d) To acknowledge sources of financial support.

136. Which of the following is not a characteristic of a good business data analyst?
a) Technically current (e.g. software).
b) Communicates well (both written and oral).
c) Adapts answers to client desires.
d) Can deal with imperfect information.

137. Which of the following statements is not true?
   a) A statistic is a single measure that is calculated from a sample.
   b) Statistics is the science of collecting, organizing, analyzing, interpreting, and presenting data.
   c) For day-to-day data business analysis,most firms rely on a staff of expert statisticians.
   d) A statistical test may be significant yet have no practical importance.

138. Which of the following is a desirable characteristic of an executive summary?
   a) It uses precise scientific terminology and statistical jargon.
   b) It is usually several pages long, so as to cover all the details.
   c) It outlines the methods and key findings so they cannot be missed.
   d) It contains tables, charts, graphs, and sometimes a data appendix.

139. If 25% of the students in my morning statistics class watch 8 or more hour of television a week, I conclude that 25% of all studentsat the University watch 8 or more hours of television a week. The most important logical weakness of this conclusion would be
   a) Relying on a sample instead of surveying every student.
   b) Using a sample thatmay not be representative of all students.
   c) Failing to correct for unconscious interviewer bias.
   d) Assuming cause and effect where none exists.

140. To improve your statistical report writing skills you should
   a) Set aside 25% of your project time budget to write the report.
   b) Outline the report format before you begin.
   c) Have your report reviewed by trusted peers, and plan to revise it more than once.
   d) Do all of the above.

141. Which is not a key aspect of business intelligence?
   a) Collecting and storing data in an accessible form.
   b) Accessing and analyzing data to make business decisions.
   c) Converting structured information into raw data.
   d) Using data to improve processes and decisions.

142. The amount added to a cost to arrive at a selling price is ……

   a) Markup
   b) Margin
   c) Both markup & margin
   d) Percent on cost

143. At break even point, the company has a positive cash flow that is ……after meeting expenses
   a) Surplus cash
   b) Slake cash

c) Net cash
d) None of these

144. If the cost of a certain goods item is Rs. 2400 and its selling price is Rs. 4500 then the markup rate is
a) (4500-2400)/2400
b) (4500-2400)4500 *100
c) (4500-2400)/2400*100
d) (4500-2400)/4500

145. Total marks of Saleem in two subjects are 160. If the ratio of marks in the two subjects is 3 : 5, what will be the marks in two subjects? Select correct option:
a) 50, 110
b) 60, 100
c) 70, 90
d) 80, 80

146. A chartered bank is lowering the interest rate on its loans from 9% to 7% what will be the percent decrease in the interest rate on a given loan.
a) 28.6%
b) 27.2%
c) 22.2%
d) None of these

147. An identity matrix is a _____ matrix with 1's on the main diagonal from upper left to lower right and 0's off the main diagonal.
a) Square
b) Rectangular
c) Column
d) None of these

148. Discount = ------
a) Net cost price – List price
b) List price – Net cost price
c) List price * Net cost price
d) List price + Net cost price

149. The salary of an employee is as follows: Basic salary = 10, 0000 Rs. Allowances = 50,000 Rs. Find the % allowances?
a) 10%
b) 50%
c) 30%
d) None of these

150. Harry made $16,000 last year at his job. He paid 11% in income tax. How much was his tax?

a) 176
b) 16011
c) 1760
d) 4500

151. If P=Principal, R=rate percent per annum, T=time in years and I=simple interest then
a) I= PRT
b) I=PR/T
c) I=PT/R
d) None of these

152. Convert 60% Markup (MU) on Cost to % Markup on Sale
a) 27.5%
b) 37.5%
c) 47.5%
d) 57.5%

153. An expression 2x is called
a) Monomial
b) Binomial
c) Trinomial
d) Polynomial

154. List price of an item is Rs.400 but if 50% discount is offered on it then its net price is
a) Rs.100
b) Rs.200
c) Rs.400
d) Rs.300

155. If the cost of tea bags increases from Rs 85.75 to Rs 90.50. What is the percentage increase?
a) 5.54
b) 6.65
c) 7.50
d) 8.25

156. Solution of linear equation; 0x+8 = 5
a) Can never be determined
b) -3
c) 0
d) -13

157. The amount added to a cost price while calculating a selling price is called
a) Actual price

b) Markup
c) Margin
d) Markdown

158. If basic salary of an employee is 18,000 Rs. What is the total saving of the employee per month on account of provident fund?
a) 3272.73
b) 3272.23
c) 3273.63
d) 3271.45

159. If x + 2 : 2 = x : 3, then x =?
a) 2
b) -3
c) 5
d) -6

160. Let L be the list price and d represent the percentage discount, then the Amount of discount is = ……
a) d*L
b) d / L
c) d +L
d) L/d

161. The rate at which the calculations are made is called
a) Discount factor
b) Discount Rate
c) Discount Value
d) None

162. After the merchant buys merchandise, it is sold at a higher price called the-------
a) Cost price
b) Revenue
c) Mark down
d) None of these

163. Dividends, payments on the installments purchases, payments on the rent, interest payments on the bonds, mortgage payments and premium on insurances are all the examples of
a) Simple interest
b) Compound interest
c) Gratuities
d) Annuity

164. The algebraic expression: x2+xy-6y2 is an example of
a) Trinomial

b) Binomial
c) Both trinomial and Polynomial
d) Both Binomial and Polynomial

165. What shall be compound intrest earned on Rs.750 invested at 12% per annum for 8 years.

a) Rs.1857
b) Rs.750
c) Rs.1107
d) None of these

166. Any matrix in which numbers of rows and columns are equal is called …….. matrix.

a) Identity
b) Triangular
c) Diagonal
d) Square

167. The formula FV (ordinary Annuity) = C * [(1 + i)n – 1/i] is used to find the value of

a) Future value of the annuity
b) Accumulation factor
c) Amount of annuity
d) Non of above

168. Convert 50% Markup on Sale to % Markup on Cost.

a) 50%
b) 100%
c) 150%
d) 200%

169. The Earning per share is the total profits of a company divided by the

a) Annual dividend
b) Number of shares
c) Market value per share
d) Earning per share

170. The unknown value in the proportion: 2: x = 3: 9, is ….

a) 5
b) 6
c) 7
d) 8

171. Nauman earned 8% profit on investment of 1000 Rs and in the next deal he has a lost of 8% on the earned amount. What is his original amount now?

a) 1000

b) 993.6
c) 1004
d) None of these

172. If 2.5 : 7.5 = 3.7 : x, then x = ?
a) 10.10
b) 11.10
c) 12.10
d) 13.10

173. In Excel, if we write 4 in A5 cell & 9 in B5 cell, then formula is
a) "=A5 + B5"
b) "=B5 + A5"
c) Both (a)&(b)
d) None

174. Solve the following algebraic expression [X^2-1] / [x^3 -1]
a) [x+1] / [x^2+x+1]
b) [x+1] / [x^2-x+1]
c) [x-1] / [x^2-x+1]
d) None of these

175. If the basic salary of an employee of a company is Rs.14000, then his/her provident fund is
a) Rs.2425.45
b) Rs.2545.45
c) Rs.2525.45
d) None of these

176. One dozen bananas cost Rs. 15. They are sold at the markup of 12%. The selling price is -----
a) 16.8
b) 15.8
c) 14.8
d) 17.8

177. Identity matrix is also a …….. matrix
a) Square
b) Triangular
c) Diagonal
d) Both (i)&(iii)

178. The unknown value in the proportion: 2: x = 3: 9, is ….
a) 5
b) 6
c) 7

d) 8
e) 6

179. The trade discount is calculated by ----------
a) dL
b) d - L
c) d + L
d) d - dL

180. If Ali buys pencil 3 Rs. and sell it at price 3.5 Rs. What is percent markup on selling price?
a) 14.1
b) 14.3
c) 14.5
d) None of these

181. In the word BALLOONS, the ratio of vowels to consonants is
a) 3/5
b) 3/8
c) 5/3
d) 8/5

182. After the new admission to the school, there is an increase of 30 percent of students. If the total number of students is now 1200, what were total students before admission?
a) 823
b) 923
c) 1023
d) 1123

183. A matrix is a_____ array of numbers.
a) Square
b) Triangular
c) Rectangular
d) None of these

184. The value of the unknown x in the proportion 2:x=3:9 is given by
a) 6
b) 3
c) 1/3
d) 2

185. A businessman pays an amount of Rs. 3000 to purchase for certain item and sells it at Rs. 3750. Then Mark up rate of the businessman is?
a) 32%
b) 31%

c) 30%
d) 25%

186. If the basic salary of an employee is Rs.14,000 then the utility allowances are ……
a) Rs.1400
b) Rs.700
c) Rs.350
d) None of these

187. If the basic salary of an employee is Rs.14,000 ,then his/her house rent allowance is……
a) Rs.4500
b) Rs.5600
c) Rs.6300
d) None of these

188. For a product, if its list price is Rs.500 at the discount rate of 25% then its net cost price is
a) Rs.375
b) Rs.125
c) Rs.625
d) Rs.525

189. The value of unknown x in the proportion 2x : 2 = (x+1) : 5 is
a) 1/4
b) 1/2
c) 4
d) 5/2

190. The value of (25) ^ -1/2 is....
a) 0.5
b) 0.4
c) 0.3
d) 0.2

191. Invoice was dated December 1st. The terms 3/15 mean that 3% discount is offered if invoice is paid up to 15th December. What is the net payment for invoice value of Rs. 35,000 if paid up to 15th December
a) Rs. 34950
b) Rs. 33950
c) Rs. 32950
d) Rs. 31950

192. For Rs. 1630 you can purchase a 7-year ordinary annuity that will pay you a yearly payment of Rs. 430 for 7 years. The compound annual interest rate implied by this arrangement is closest to

a) 8%
b) 10%
c) 9%
d) 11%

193. If the order of a matrix A is 3X3,what shall be order of its inverse?

a) 2X2
b) 3X3
c) 2X3
d) None of these

194. The salary of an employee is as follows: Basic salary = 20,000 Rs. Allowances = 5,000 Rs. What is the cost on account of casual leaves per year if normal working days per month is 22?

a) Rs. 6818.1
b) Rs. 20454.5
c) Rs. 13636.4
d) Rs. 34090.9

195. The rate at which the calculations are made is called

a) Discount factor
b) Discount Rate
c) Discount Value
d) None

196. In 3 years you are to receive Rs. 8,000. If the interest rate were to suddenly increase, the present value of that future amount to you would

a) Fall
b) Rise
c) Remain unchanged.
d) Cannot be determined without more information

197. 15% of the price of a shirt is increased. If the change in the price of the shirt is Rs 25, what is the original price?

a) Rs 150.5
b) Rs 166.7
c) Rs 175.5
d) Rs 180.5

198. Tanveer's flower business sells floral arrangements for Rs.35.To make his desired profit; Tanveer needs a 40% markup on selling price. What do floral arrangements cost Tanveer?

a) Rs.21

b) Rs.30
c) Rs.25
d) None of these

199. How many basic mathematical operations are used?
a) 2
b) 3
c) 4
d) 5

200. Harry made $16,000 last year at his job. He paid 11% in income tax. How much was his tax?
a) 176
b) 16011
c) 1760
d) 4500

201. If I is the identity matrix of dimension 10 then how many rows and columns a matrix A may have provided that IA = A
a) 10 number of rows & arbitrary number of columns
b) Arbitrary no. of rows & columns
c) Strictly '10' no of rows & '10' no of columns
d) 10' no. of columns & arbitrary no. of rows

202. A Range which starts from A1 and ends at D15 is referenced by...
a) A1:D15
b) D15:A1
c) Both (a)&(b)
d) None

203. What is the formula for money accrued after n years.
a) S= P(1+r*100)^n
b) S=P(1+r/100)^n
c) S= P(1+100/r)^n
d) None of these

204. Returns the interest payment for an investment for a given period?
a) ISPMT
b) NPER
c) IPMT
d) None of these.

205. If A, B and C are matrices with orders 3×3, 2×3 and 4×2 respectively, then which of the following set of operations are possible?
a) 4B, A + B, B+C, AB, CB, CBA
b) 4B, CB, CBA

c) A + B, B+C, CB, CBA
d) 4B, CB, CBA

206. If 5x/2 = 9y/2 then, the ratio x: y = ……
a) 9:4
b) 9:5
c) 9:2
d) 9:6

207. The determinant of a matrix always exist
a) For square matrices only
b) For rectangular matrices only
c) For horizontal arrays only
d) For vertical arrays only

208. Sum of annuity is always
a) Present value
b) Current value
c) Net present value
d) None of these

209. The difference between revenue and cost is called the
a) Net present value
b) Net income
c) Net Cash flow
d) None of these

210. Order of a matrix =_____.
a) Number of rows X number of columns
b) Number of columns X number of rows
c) Number of rows – number of columns
d) None of these

211. In a Proportion, a : b : : c: d , The product of …….
a) Means and extremes must be equal
b) Means must be greater than extremes
c) Extremes must be greater than mean
d) None of these

212. In order to stimulate the demand, the deduction in original sale price of an item is called
a) Discount
b) Markup
c) Retail price
d) Markdown

213. Percent is an Excel operator.
   a) True
   b) False

214. The contribution margin per unit is an item's selling price minus the item's.....
   a) Fixed costs
   b) Variable costs
   c) Both variable costs & fixed costs.
   d) Net sales.

215. Contribution Margin is the amount that can be calculated by deducting Variable Cost from
   a) Contribution rate
   b) Net sale
   c) Net income
   d) None of these.

216. ……is the value at the end of depreciation.
   a) Salvage
   b) Asset
   c) Cost
   d) None of these.

217. Difference between IRR and XIRR is that ----------
   a) IRR needs regular interval, but XIRR does not need regular intervals
   b) XIRR does not calculate Internal Rate of Return, as IRR does.
   c) The schedule cash flows are needed for IRR only.
   d) None of these

218. …… is the number of periods over which the asset is depreciated.
   a) Life
   b) Asset
   c) Interval
   d) None of these

219. If Variable Cost is Rs.120 and contribution margin is Rs 30, then sale will be ----------
   a) 120
   b) 130
   c) 140
   d) 150

220. Which of the following function returns the depreciation of an asset for a specified period.
   a) DDB
   b) DB

c) IRR
d) MIRR

221. SLN is for depreciation of
a) Asset
b) Profit
c) Loss
d) Capital

222. Contribution margin in Rs. Is equal to
a) =(CM/FC)
b) =(FC/CM)*S
c) =(S-FC)*CM
d) = (CM-S)*FC.

223. The regression equation should only used
a) When there is significant linear correlation
b) When there is significant mluticorrelation
c) When there is significant quadratic correlation
d) When there is significant simple correlation

224. In the central tendency Mean, Median and Mode
a) Mean is better than Median
b) Median is better than Mode
c) Mean is better than Mode
d) All of these are true

225. The degree to which numerical data tend to spread about an average is called
a) The dispersion
b) Standard deviation
c) Correlation
d) None of these

226. ……..graphs are similar to bar graphs.
a) Column
b) Line
c) Conversion
d) Sector

227. A pattern of variation of a time series that repeats every year is called:
a) Cyclical
b) Seasonal
c) Trend
d) Secular

228. If the values of variables are increasing or decreasing in the same direction then such kind of correlation is referred as
   a) Zero Correlation
   b) Perfect Correlation
   c) Positive Correlation
   d) Negative Correlation

229. The best measure of variation is
   a) Range
   b) Quartile deviation
   c) Variance
   d) Coefficient of variance

230. In the scatter diagram, clustering of points around a straight line indicates
   a) Linear regression
   b) Non-linear regression
   c) Curvilinear regression
   d) None of these

231. Ms. Christian calculated a correlation coefficient of .75. Which of the following reflects the best interpretation of this?
   a) Weak negative.
   b) Strong negative.
   c) Weak positive.
   d) Strong positive.

232. If all the points in the scatter diagram seem to lie near a line, the correlation is said to be
   a) Quadratic
   b) Linear
   c) Positive
   d) Negative

233. A Linear line always represent …….. graph.
   a) Circle
   b) Line
   c) Conversion
   d) Sector

234. How many columns, frequency distribution contains ?
   a) Two
   b) Three
   c) Four
   d) None of these

235. Which of the following is a measure of central tendency?

a) Percentile
b) Quartile
c) Standard deviation
d) Mode

236. The slope of the regression line may be
a) Positive
b) Negative
c) Zero
d) All of these

237. The Basic salary of an employee is Rs 7,000. What is the contribution of the company on account of gratuity to the Gratuity Trust Fund?

a) **Rs 636.36**
b) Rs 6363.6
c) Rs 63.636
d) Rs 6363

238. The monthly incomes of A and B are in the ratio 4 : 5, their expenses are in the ratio 5 : 6. If 'A' saves Rs.25 per month and 'B' saves Rs.50 per month, what are their respective incomes?

a) Rs.400 and Rs.500
b) Rs.**240 and Rs.300**
c) Rs.320 and Rs.400
d) Rs.440 and Rs.550

239. Sum of annuity is always

a) Present value
b) **Future value**
c) Net present value
d) Current value

240. In annuity interest is charged by the:

a) Simple interest method
b) Compound interest method
c) **Both simple and compound interest method**
d) Accumulated method

241. Find x if $3(x + 2) - 7 = 11$.

a) 2

b) -4
c) 6
d) **4**

242. The value of x after solving the following linear equation is

$$-2x + 6 = 4x - 2$$

a) 0
b) 3
c) 1/2
d) **4/3**

243. The sequence of payments at equal interval of time is called

a) **Annuity**
b) Accumulated value
c) Discounted value
d) None of these

244. Ali has improved his typing speed from 40w/m to 60w/m.The percentage improvement is

a) 20%
b) 150%
c) **50%**
d) 30%

245. Markdown means a reduction from the

a) Original cost price
b) **Original sale price**
c) Original Net price
d) None of these

246. Markup is an amount added to ----------

a) Get accumulated interest
b) **A cost price while calculating a selling price.**
c) The principal amount of the loan.
d) Accumulation factor.

247. Interest calculated upon the principal amount added to the interest on it is called ……

a) Simple interest

b) **Compound interest**
c) Annual interest per year
d) Semi annual interest

248. Contribution Margin is the Rs. amount that is equal to ----------

a) **S – VC**
b) VC – S
c) FC – VC
d) VC – FC

249. Reduction from original selling Price is called ……

a) Loss
b) List price
c) Profit
d) **Markdown**

250. What will be the simple interest earned on an amount of Rs. 16,800 in 9 months at the rate of % p.a?

a) Rs. **787.50**
b) Rs. 812.50
c) Rs 860
d) Rs. 887.50

251. A percentage is a way of expressing a number as

a) A**fraction of 100 .**
b) Sum of number with 100.
c) Multiplication of number with 100.
d) Average of number with 100.

252. To convert a number in percent (%) from a fraction, we do which of the following operation:

a) Add by 100
b) Subtract by 100
c) **Multiply by 100**
d) Divide by 100

253. What result will I get when press enter in cell D9?

a) 75

b) **B5+C5+D5+E5+F5**
c) Error
d) Cannot be determine

254. Interest paid (earned) on only the original principal borrowed (lent) is often referred to as

a) **Simple interest**
b) Present value
c) Future value
d) Compound interest

255. The formula for finding BEP in units is given by

a) FC/VC
b) **FC/(S-VC)**
c) CM/FC
d) CM/VC

256. If A is a matrix whose determinant is zero then its inverse is given by:

a) **Zero**
b) Product of its diagonal entries
c) Infinite
d) Cannot be determined

257. Which of the following is linear equation

a) **2x-3y=-6**
b) x+x+x
c) $520x^2y^2$
d) y^2 -3=0

258. Percentage of ratio of given number with standard number is.....

a) 100
b) **Same number**
c) 1000
d) 10

259. A discrete probability function f(x) is always:

a) Zero
b) One
c) Negative
d) Non-negative

260. If f(x) is a continuous probability function, then P(X = 2) is:

a) 1
b) 0
c) 1/2
d) 2

261. The range of the binomial distribution is:

a) 0, 1, 2, …… 100
b) 0, 1, 2, …… n
c) 0, 1, 2, …… x
d) 1,2, ……n

262. In which of the following situations binomial distributions is approximate to normal distribution?

a) n = 50, p = 0.01
b) n = 500, p = 0.001
c) n = 100, p = 0.05
d) n = 50, p = 0.02

263. The location and shape of the normal curve is (are) determined by:

a) Mean
b) Variance
c) Mean & variance
d) Mean & standard deviation

264. A random experiment has five outcomes in its sample space {s1, s2, s3, s4, s5}. If P(s1)=0.2,P(s2)=0.3, P(s3)=0.1 and P(s4)=0.2 then P(s5)=?

a) 1
b) 0.2
c) 0.8
d) 0.5

265. The joint density function f(x,y) will be a pdf if

a) Both of integrals f(x,y) dx dy =1
b) Both of integrals f(x,y) dx dy>1
c) Both of integrals f(x,y) dx dy<1
d) Both of integrals f(x,y) dx dy =0

266. Which of the following is correct property for joint probability distribution of X and Y:

a) Sigma f(X,Y)=1
b) Sigma f(Y,X)=1
c) Both of above
d) None of above

267. A random variable that can assume every possible value in an interval [a, b]:
a) Discrete variable
b) Continuous variable
c) Qualitative variable
d) Categorical variable

268. Normal approximation to the binomial distribution is used when:
a) np>5
b) nq>5
c) Both of the above
d) None of the above

269. The Maximum Likelihood Estimators (MLE) are …… and …… but not necessarily ……
a) Unbiased, consistent, efficient
b) Consistent, unbiased, efficient
c) Unbiased, efficient, consistent
d) Consistent, efficient, unbiased

270. A probability density function 'f(x)' has the following property:
a) f(x) <= 0
b) f(x) < 0
c) f(x) > 0
d) f(x) >= 0

271. For a continuous random variable X, P(X = x) is:
a) 0
b) 0.5
c) 1
d) undefined

272. An urn contains 4 red balls and 6 green balls. A sample of 4 balls is selected from the urn without replacement. It is the example of:
a) Binomial distribution
b) Hyper geometric distribution
c) Poisson distribution

d) Exponential distribution

273. The probability distribution of the proportion of successes in all possible samples is called the:

a) Sampling distribution
b) Sampling probability distribution
c) Sampling distribution of sample proportions
d) Sampling distribution of Population proportions

274. E(4X + 5) =_____

a) 12 E (X)
b) 4 E (X) + 5
c) 16 E (X) + 5
d) 16 E (X)

275. For good approximation of Poisson distribution to the binomial distribution, which of the following condition (s) is/are required:

a) The population size is large relative to the sample size
b) The probability, p, is close to .5 and the population size is large
c) The probability, p, is small and the sample size is large
d) The probability, p, is close to .5 and the sample size is large

276. If an estimator is more efficient then the other estimator, its shape of the sampling distribution will be

a) Flattered
b) Normal
c) Highly peaked
d) Skewed to right

277. Match the binomial probability P(x< 23) with the correct statement.

a) P(there are at most 23 successes)
b) P (there are fewer than 23 successes)
c) P (there are more than 23 successes)
d) P (there are at least 23 successes)

278. In statistics, the term 'expected value' implies the ___ value.

a) Independent
b) Normal
c) Standard
d) Mean

279. A quantity obtained by applying certain rule or formula is known as

a) Estimate
b) Estimator
c) Parameter
d) Proportion

280. Total no. of possible samples of size 2 (without replacement) from the population of size 6, will be:

a) 20
b) 15
c) 10
d) 18

281. When a coin is tossed 3 times, the probability of getting 3 or less tails is

a) 1/2
b) 0
c) 1
d) 3/5

282. Total no. of possible samples of size 3 (with replacement) from the population of size 6, will be:

a) 256
b) 196
c) 216
d) 325

283. If c is a constant, then E(c) = ___

a) 0
b) 1
c) c
d) -c

284. Using the normal approximation to the binomial distribution with n= 3 and p= 0.0571 the value of mean is:

a) 0.1713
b) 0.2132
c) 0.5133
d) 0.1923

285. Suppose 60% of a herd of cattle is infected with a particular disease. Let Y = the number of non-diseased cattle in a sample of size 5. the distribution of Y is:

a) Binomial with n = 5 and p = 0.6
b) Binomial with n = 5 and p = 0.4
c) Binomial with n = 5 and p = 0.5
d) Poisson with u = .6

286. A random experiment has five outcomes in its sample space {s1, s2, s3, s4, s5}. If P(s1)=0.2,P(s2)=0.3, P(s3)=0.1 and P(s4)=0.2 then P(s5)=?
a) 1
b) 0.2
c) 0.8
d) 0.5

287. The probability of success changes from trial to trial, is the property of:
a) Binomial experiment
b) Hyper geometric experiment
c) Both binomial & hyper geometric experiment
d) Poisson experiment

288. If a statistic used as an estimator, has its expected value equal to the true value of the population parameter being estimated then it is called .....
a) Consistent
b) Unbiased
c) Efficient
d) Sufficient

289. In moments method, how many equations are needed to find the 2 unknown parameters?
a) 2
b) 3
c) n/2

290. Which of the following is correct property for joint probability distribution of X and Y:
a) Sigma f(X,Y)=1
b) Sigma f(Y,X)=1
c) Both of above

291. Which of the following is desirable for a good point estimator?
a) Consistency
b) Unbiasedness
c) Efficiency
d) All of these

292. The distribution function (df) is also known as
   a) Probability distribution
   b) Probability mass function
   c) Probability density function
   d) Cumulative distribution function

293. If X and Y are two discrete r.v's with joint probability function f(x,y), then the conditional probability function Y given X, f(y|x) is given by
   a) f(yj | xi) = f(xi, yj) / g(xi)
   b) f(yj | xi) = f(xi, yj) / h(yj)
   c) f(yj | xi) = f(xi, yj) / Sum of g(xi)
   d) f(yj | xi) = f(xi, yj) / sum of h(yj)

294. If the sample mean is an unbiased estimator for the population mean then:
   a) The sample mean has a normal distribution
   b) The average sample mean, over all possible samples, equals the population mean
   c) The sample mean is always very close to the population mean
   d) The sample mean will only vary a little from the population mean

295. Which of the probability distributions has three parameters?
   a) Binomial distribution
   b) Normal distribution
   c) Hyper geometric distribution
   d) Poisson distribution

296. A standard deviation obtained from sampling distribution of sample statistics is known as
   a) Sampling error
   b) Standard error
   c) Minimum error
   d) Universal error

297. A parameter is a .....quantity.
   a) Constant
   b) Variable
   c) Sample
   d) Random

298. How can you define statistical inference?
   a) A decision, estimate, prediction or generalization about the population based on information contained in a sample

b) A statement made about a sample based on the measurements in that sample
c) A set of data selected from a larger set of data
d) A decision, estimate, prediction or generalization about sample based on information contained in a population

299. Which of the following is most important and most widely used method in point estimation?
a) The method of moments
b) The method of fractional moments
c) The method of leas square
d) The method of maximum likelihood

300. The location and shape of the normal curve is (are) determined by:
a) Mean
b) Variance
c) Mean & variance
d) Mean & standard deviation

301. A discrete probability function f(x) is always:
a) Zero
b) One
c) Negative
d) Non-negative

302. Binomial distribution is skewed to the right if:
a) p=q
b) P<q
c) p>q
d) p=n

303. The Probabilities of the various values of the sample satistic can be computed using the..... definition of probability.
a) Subjective
b) Objective
c) Classical
d) None of the baove

304. E(10X +3) =_____
a) 10 E(X)
b) E(X)+3
c) 10 E(X)+3

d) 100E(X)

305. If p is very small and n is considerably large then we shall apply the:
a) Binomial distribution
b) Hyper geometric distribution
c) Poisson distribution
d) Exponential distribution

306. Which of the following is NOT applicable to a Poisson distribution?
a) IF P = 0.5 & n = 19
b) IF P = 0.01 & n = 200
c) IF P = 0.02 & n = 300
d) IF P = 0.03 & n = 500

307. The normal distribution has points of infection which are equidistance from the:
a) Median
b) Mean
c) Mode
d) Mean, Median & Mode

308. The distribution function (df) is also known as
a) Probability distribution
b) Probability mass function
c) Probability density function
d) Cumulative distribution function

309. If a random variable X denotes the number of heads when we toss a fair coin 5 times, the X assumed the values:
a) 0,1,2,3
b) 1, 2,3,4,5
c) 0, 1, 2,3,4,5
d) 1, 5, 5

310. As a rule of thumb, when n>=30, then we can assume that……is normally distributed:
a) Probability distribution
b) Sampling distribution
c) Binomial distribution
d) Sampling distribution of sample mean

311. If b(x, 7, 0.30), the variance of this distribution is:

a) 1.77
b) 1.74
c) 1.44
d) 1.47