Final Term Papers Solved MCQS with Reference

1. The parameter of the chi-square distribution is……

- **v** **PG # 306 (Lec # 41)**
- v – 1
- v – 2
- v –p

2. The value of x^2 can never be :

- Zero
- Less than 1
- Greater than 1
- **Negative**

3. Analysis of variance is a procedure that enables us to test the equality of several:

- Variances
- **Means** **PG # 320 (Lec # 43)**
- Proportions
- Groups

4. When two coins are tossed the probability of at most one head is:

- 1/4
- 2/4
- **3/4**
- 4/4

5. The critical region for $H_1 : \mu < \mu_0$ *when* $\alpha = 0.05$ is

- $z > z_{0.05}$ **PG # 281 (Lec # 37)**
- $|z| > z_{0.01}$
- $z < -z_{0.05}$
- $|z| > z_{0.05}$

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

- **Non -negative**
- Negative
- One
- Zero

Note: A discrete distribution describes the probability of occurrence of each value of a discrete random variable. A discrete random variable is a random variable that has countable values, such as a list of non-negative integers.

7. When f(x) is When f(x) is continuous probability function for, then P(X = 1) is:

- 1
- ∞
- $-\infty$
- **0** **PG # 188 (Lec # 24)**

8. A random variable can be generated:

- Manually
- Mechanically
- **Manually & Mechanically** **PG # 167 (Lec # 22)**
- Mathematically

Note: Such a numerical quantity whose value is determined by the outcome of a random experiment is called a random variable. Random numbers are the numbers obtained by some random process (manually or mechanically).

9. The curve of the F-distribution depends upon:

- **Degree of freedom** **PG # 312 (Lec # 42)**
- Standard deviation
- Mean
- Variance

10. The mode value from raw data can be obtained by the help of

- **Dot plot** **PG # 53 (Lec #6)**
- Stem and leaf plot
- Bar chart
- None of these

11. In normal distribution, the quartile deviation Q.D =…….:

- 0.5σ
- 0.75σ
- 0.7979σ
- 0.6745σ

Note: The quartiles are given by:
Lower quartile $Q_1 = \mu - 0.6745\sigma$ and **Upper quartile** $Q_3 = \mu + 0.6745\sigma$

12. A randomly selected sample of 400 students at university was asked whether or not they will participate in politics. Forty-six percent of the 400 student surveyed answered " yes". Which one of the following statement about number 46% is correct?

- **It is a sample statistic.**
- It is a population parameter.
- It is a margin of error.
- It is a standard error.

Note: In statistics a data sample is a set of data collected and/or selected from a statistical population by a defined procedure. The elements of a sample are known as sample points, sampling units or observations.

13. A student solved 25 questions from first 50 questions of a book. The probability that he will solve the remaining all questions is:

- 0.25
- **0.5**
- 1
- 0

14. The average which is defined as the reciprocal of the arithmetic mean of the reciprocals of the values is called:

- Geometric Mean
- **Harmonic Mean** **PG # 77 (Lec # 9)**
- Mode
- Median

15. For the independent events A and B if P (A) = 0.25, P (B) =0.40 then P $(A \cap B)$ =……

- 0.65
- **0.1** **PG # 162 (Lec # 21)**
- 0.50
- 0.15

16. The total number of samples when sampling is done with replacement is equal to:

- N^n **PG # 237 (Lec # 31)**
- C_n^N
- $\frac{N-n}{N-1}$
- 1

17. Which of the following is correct option to find P(X +Y < 1) ?

- f(0 , 0) + f(0,1) + f(1,2)
- f(2,0) + f(0, 1) + f(1, 0)
- f(0, 0) +f (1, 1) + f(1, 0)
- **f (0,0)+ f (0,1) + f (1,0)** **PG # 197 (Lec # 26)**

18. The conditional probability function $f(x|1) =$ _____

- $f(1,1)$
- $f(x,1)$
- $\frac{f(x,1)}{h(1)}$ **PG # 198 (Lec # 26)**
- $\frac{f(x,1)}{h(x)}$

19. In interval estimation, we always get:

- **Range of values** **PG # 264 (Lec # 34)**
- Zero
- Single value
- Two values

20. Which of the following is an unbiased estimator of population σ^2 ?

- $\frac{\sum(x-\bar{x})^2}{n}$
- $\frac{\sum(x-\bar{x})^2}{n-2}$
- $\frac{\sum(x-\bar{x})^2}{n(n-1)}$
- $\frac{\sum(x-\bar{x})^2}{(n-1)}$ **PG # 267 (Lec # 34)**

21. How many parameter(s) are in t-distribution?

- 0
- **1** **PG # 293 (Lec # 39)**
- 2
- 3

22. A deserving player is not selected in the team is an example of:

- **Type I error** **PG # 278 (Lec # 36)**
- Type II error
- Correct decision
- No information regarding this

23. After an interval is constructed, then what is the probability of occurrence of the parameter in it?

- Zero
- One
- Fifty
- **Either one or zero** **PG # 268**

24. If $\overline{X}$ is the mean of the n observations, then which test statistic will be used to calculate the confidence limits of the population variance σ^2 ?

- Z-statistic
- T-statistic
- x^2 **-statistics**
- F-statistics

25. If mean of x^2 distribution is k then variance will be:

- k^2
- $2k$ **Click Here For Reference**
- $1/k$
- K

26. What is the graphical shape of the chi-square distribution?

- **Positively skewed** **PG # 307 (Lec # 41)**
- Negatively skewed
- Uniformly distributed
- Normally distributed

27. What factor determines the shape of the t-distribution?

- **Degree of freedom** **PG # 293**
- Critical value
- Frequency of data
- Probability

28. If X and Y are random variables, then $E(X-Y)$ is equal to:

- $E(X)+E(Y)$
- $E(X)-E(Y)$ **PG # 202 (Lec # 26)**
- $X-E(Y)$
- $E(X)-Y$

29. In the regression line Y= a + bX, the non-random variable is:

- Y
- X
- Both X and Y
- **Neither X nor Y**

Note: X and Y are two random variables. We assume that Y depends on X. i.e., when variable X takes a specific value, we expect a response in the random variable Y. In other words, the value taken by X influences the value of Y. So X is the independent variable and Y is the dependent variable.

30. The parameters of the binomial distribution b(x; n, p) are:

- x & n
- x & p
- **n & p** **PG # 212**
- x, n & p

Note: Because the pmf (probability mass function) of a binomial random variable X depends on the two parameters n and p, we denote the pmf by b(x; n, p).

31. Which of the following is true for the binomial distribution b(x; n, p):

- **mean > variance** **Click Here For Reference**
- mean < variance
- mean=variance
- mean= standard deviation

32. Hypergeometric probability distribution has :

- (n, k) parameter
- (N) parameter
- (N, n, N-k) parameter
- **(N, n, k) parameter** **PG # 219 (Lec # 28)**

33. The variance of the hypergeometric probability distribution is:

- $\sigma^2 = n\frac{k}{N}$
- $\sigma^2 = n\frac{k}{N}\frac{N-k}{N}\frac{N-n}{N-1}$, **PG # 221 (Lec # 29)**
- $\sigma^2 = npq$
- $\sigma^2 = N\frac{n}{K}$

34. Tabulation is the process of arranging data into:

- Different classes
- Rows
- Columns
- **Rows and Columns**

Note: Tabulation is a systematic presentation of numerical data in row and columns. Tabulation of classified data makes it more intelligible and fit for statistical analysis.

35. A simple bar chart consists of:

- Vertical bars
- Horizontal bars
- **Vertical or Horizontal bars** **PG # 24 (Lec # 3)**
- Multiple bars

36. Which one is the formula to calculate the approximate value of class interval?

- Minimum value/Range
- Maximum value/No. of classes
- **No. of classes/Range** **PG # 29 (Lec # 4)**
- Range/ No. of classes

37. Which one of the following is equal to the 2nd quartile:

- P_{33}
- D_3
- **Median** **PG # 69 (Lec # 8)**
- Mode

38. For the independent events A and B if P (A) = 0.15, P (B) = 0.50 then P $(A \cap B)$ =…….

- 0.50
- **0.075** **PG # 162**
- 0.125
- 0.060

39. Which one of the following measure is not based on all the observations?

- Arithmetic Mean
- Geometric Mean
- Harmonic Mean
- **Mode**

Note: Mode is that value of the variable which occurs or repeats itself maximum number of item.

40. When each outcome of a sample space has equal chance to occur as any other, the outcomes are called:

- Mutually exclusive
- **Equally likely** **PG # 147 (Lec # 17)**
- Not mutually exclusive
- Exhaustive

41. An expected value of a random variable is equal to:

- Variance
- **Mean** **PG # 191(Lec # 25)**
- Standard deviation
- Covariance

42. The sum of deviations is zero, when deviations are taken from:

- **Mean**
- Median
- Mode
- H.M

43. The distribution function F(x) is equal to

- $P(X = x)$
- $P(X \leq x)$ **PG # 174 (Lec # 23)**
- $P(X \geq x)$
- $P(X > x)$

44. In a one-way ANOVA:

- The interaction term has (c - l)(n - 1) degrees of freedom
- An interaction term is given
- **An interaction effect can be tested** **Click Here For Reference**
- There is no interaction term

45. The degrees of freedom for a t-test with sample size 'n' is:

- **n-1** **PG # 341 (Lec # 45)**
- n+1
- n-2
- n+2

46. Rumour has reached the Trading Standards Officer that the manufacturer ABC is deliberately underfilling his cartons of orange juice. It is decided that a sample should be taken to check this claim. The stated contents on the carton are 100 ml on the average, then the null hypothesis is:

- $H_0 : \mu = 100$ **PG # 278 (Lec # 36)**
- $H_0 : \mu > 100$
- $H_0 : \mu < 100$
- $H_0 : \mu \neq 100$

47. When c is a constant, then E(c) is:

- 0
- 1
- **c** **PG # 180 (Lec # 23)**
- –c

48. The combined distribution of more than two random variables is:

- Univariate distribution
- **Joint distribution** **PG # 194 (Lec # 25)**
- Marginal distribution
- Bivariate distribution

49. The test statistic used in analysis of variance procedure follow the :

- x^2 -distribution
- T- distribution
- Z-distribution
- **F- distribution** **Click Here For Reference**

50. In normal distribution β_2 =…….:

- 1
- 2
- **3** **PG # 119 (Lec # 14)**
- 0

51. In a symmetrical distribution, the coefficient of skewness is equal to :

- –1
- +1
- **0**
- 2

Note: If the coefficient of skewness is equal to zero, the shape of the distribution is symmetric.

52. Which measure of dispersion is used to compare the variation of two data sets?

- **Coefficient of variation** **PG # 92 (Lec # 11)**
- Coefficient of comparison
- Mean deviation
- Standard deviation

53. If S.D(X) = 5 then S.D $(\frac{2X+5}{2})$ =_____

- 5
- 10
- 15
- **7.5**

54. The deviation of a distribution from symmetry is called:

- Kurtosis
- **Skewness**
- Dispersion
- Flatness

55. Which one is the correct formula to find the desired sample size?

- $n=\left(\frac{Z_{\alpha/2}\sigma}{e}\right)^2$ **PG # 276 (Lec # 36)**
- $n=\left(\frac{Z_{\alpha/2}\sqrt{\sigma}}{e}\right)^2$
- $n=\left(\frac{Z_{\alpha/2}\overline{X}}{e}\right)^2$
- $n=\frac{Z_{\alpha/2}\sigma}{e}$

56. A judge can acquit a guilty person is the example of:

- Type I error
- Type II error
- **Correct decision** **PG # 278**
- No information regarding this

57. Ideally, the width of confidence interval should be:

- **0** **PG # 270**
- 1
- 99
- 100

58. If the sampling distribution of $\overline{X}$ is normal, we would expect 99% of the sample means to be within the interval:

- $\mu_x \pm 2\sigma_x$
- $\mu_x \pm 1.96\sigma_x$
- $\mu_x \pm 2.58\sigma_x$
- $\mu_x \pm \sigma_x$

59. Mean of the F - distribution is possible only, when

- $v_1 > 2$
- $v_2 > 2$ **PG # 312 (Lec # 42)**
- $v_1 < 2$
- $v_2 < 2$

60. In Statistics, we have MSE which is abbreviation of:

- **Mean square error** **PG # 330 (Lec # 44)**
- Measured square error
- Medical screening exam
- Major sampling error

61. As the degree of freedom increases, the t-distribution tends to coincide with:

- Binomial distribute
- Uniform distribution
- Hypergeometric distribution
- **Normal distribution** **PG # 293 (Lec # 39)**

62. If X and Y are independent variables, then E (XY) is:

- E(XX)
- **E(X).E(Y)**
- X.E(Y)
- Y.E(X)

63. What are the number of ways in which four books can be arranged on a shelf?

- 4
- 6
- 12
- **24** **PG # 141 (Lec # 17)**

64. When f(x) is continuous probability function for 1< X < 5, then P (X < 1) is:

- 0
- **0.25**
- 0.5
- 1

65. For any two estimators T1 and T2, if VAR (T1) < VAR(T2), then T1 is:

- Unbaised
- Sufficient
- **Efficient** **PG # 261 (Lec # 34)**
- Consistent

66. If an estimator gets closer to the population parameter by increasing sample size then it is known as:

- **Consistent estimator** **PG # 260 (Lec # 33)**
- Sufficient estimator
- Efficient estimator
- Unbiased estimator

67. Which of the following comes first to make frequency distribution.

- Number of Groups
- Class interval
- **Range** **PG # 28 (Lec # 4)**
- Tally marks

68. What curve shape would you expect for the distribution of death rates of population of all age groups?

- Symmetrical curve
- Skewed to the right
- Skewed to the left
- **U shape curve** **PG # 41 (Lec # 5)**

69. Which one is the measure of central tendency:

- Variation of the distribution
- **Average of the distribution** **PG # 51 (Lec # 6)**
- Scatterness of the distribution
- Dispersion of the distribution

70. The mean of the F–distribution is:

- $\frac{v_1}{v_1 - 2} \; for v_1 > 2$
- $\frac{v_2}{v_2 - 2} \; for v_2 > 2$ **PG # 312 (Lec # 42)**
- $\frac{v_1}{v_1 - 2} \; for v_1 \geq 2$
- $\frac{v_2}{v_2 - 2} \; for v_1 \leq 2$

71. The F-distribution always ranges from:

- 0 to 1
- 0 to $-\infty$
- $-\infty$ to $+\infty$
- **0 to $+\infty$** **PG # 312 (Lec # 42)**

72. Which of the following is a characteristics of the normal distribution:

- It is a skewed distribution
- **It is bell-shaped** **PG # 226**
- It is not asymptotic
- It is leptokurtic

Note: What are the characteristics of the normal distribution

- Unimodal
- Symmetrical
- "Bell-shaped"
- The left and right tails continue to infinity without touching the X-axis
- The mean is the population mean (mew)
- The standard deviation is the population standard deviation (little sigma)

73. For the given poisson distribution $P(X = 1)\frac{e^{-0.135}0.135^1}{1!}$ the mean value is:

- $e^{-0.135}$
- –0.135
- 0.135 **PG # 223 (Lec # 29)**
- 1

74. A good way to get a small standard error is to use a_____

- Repeated sampling
- Small sample
- **Large sample**
- Large population

75. The difference between the largest and the smallest data values is called the

- Variance
- Interquartile range
- **Range**
- Coefficient of variation

76. Which is appropriate average for finding the average speed of a car:

- Mean
- Geometric mean
- **Harmonic mean** **PG # 78 and 79 (Lec # 9)**
- Weighted mean

77. Which one is the formula of mid range:

- $x_m - x_0$
- $x_0 - x_m$
- $\frac{x_0 - x_m}{2}$
- $\frac{x_0 + x_m}{2}$ **PG # 80 (Lec # 9)**

78. Which one of the following is a meso-kurtic curve?

- Negatively skewed
- Positively skewed
- J-shaped
- **Normal** **PG # 114 (Lec # 14)**

79. If you draw all possible samples from some population, calculate the mean for each of the sample and construct the probability distribution of the sample means, what would you have?

- A population distribution
- Logical sample distribution
- **A sampling distribution** **PG # 242 (Lec # 31)**
- A parameter distribution

80. By definition f(y | x)=_____

- $f(y)$
- $f(x,y)$
- $\frac{f(x,y)}{h(x)}$ **PG # 198 (Lec # 26)**
- $\frac{f(x,y)}{h(y)}$

81. For degree of freedom $v > 2$ the variance of t-distribution is always:

- Greater than zero
- Less than one
- Equal to one
- **Greater than one** **PG # 294 (Lec # 39)**

82. Which one of the formula will be used to find out the confidence interval for μ, when population variance unknown and sample size is large?

- $\bar{x} \pm z_{\alpha/2} \frac{s}{\sqrt{n}}$ **PG # 268**
- $\bar{x} \pm t_{\alpha/2(v)} \frac{s}{\sqrt{n}}$
- $\bar{x} \pm t_{\alpha/2} \frac{\sigma}{\sqrt{n}}$
- $\bar{x} \pm Z_{\alpha/2} \frac{\sigma}{\sqrt{n-1}}$

83. In the test of goodness of fit, the _____is used as a test statistic.

- F
- T
- Z
- x^2 **PG # 332 (Lec # 44)**

84. If there are 8 treatments with 6 blocks in a randomized completed block design then what are the degrees of freedom for treatments?

- 5
- 4
- 6
- **7**

According to formula "a" is denote the Treatment of Degree of Freedom, a-1 means number of treatment minus 1, 8-1=7

Source	Degrees of Freedom
Treatment	a-1
Blocks	b-1
Residual	(a-1)(b-1)

85. Two continuous r.v.'s X and Y are said to be independent if and only if :

- $f(x,y)=g(x)h(y)$ **PG # 200 (Lec # 26)**
- $f(x,y) \neq g(x)h(y)$
- $f(x,y)>g(x)h(y)$
- $f(x,y)<g(x)h(y)$

86. The lottery tickets issued for the purpose of money-making follows a:

- Normal distribution
- **Discrete uniform distribution** **PG # 210 (Lec # 27)**
- Binomial distribution
- Hypergeometric distribution

87. Uniform distribution is defined by:

- Largest value
- **Largest and smallest value**
- Smallest value
- Central value

88. Quantitative variable is further divided into:

- Continuous variable
- Discrete variable
- **Continuous & Discrete variable** **PG # 9 (Lec # 1)**
- None of the above

89. Color of the dress is the example of:

- **Qualitative data**
- Quantitative data
- Continuous data
- Discrete data

Note: Qualitative data is information about qualities; information that can't actually be measured. Some examples of qualitative data are the softness of your skin, the grace with which you run, and the color of your eyes.

90. Which one is commonly called a bell shaped distribution?

- **Symmetrical**
- Bimodal
- Skewed
- U shaped

Note: See Mcq 72

91. A fair coin is tossed three times, the probability that at least one head appear is:

- 1/2
- 1/8
- 6/8
- **7/8** **PG # 150 (Lec # 18)**

92. The probability of simultaneous occurrence of two events is called:

- Subjective probability
- Conditional probability
- **Joint probability** **PG # 194**
- Prior probability

Note: The simultaneous occurrence of two events A and B is called a JOINT event. The probability of a joint event is called a JOINT PROBABILITY.

93. What is the stem part of 243:

- 3
- 43
- 23
- **24** **PG # 47 (Lec # 6)**

94. A numerical value used as a summary measure for a sample, such as sample mean, is known as a:

- Population Parameter
- Sample Parameter
- **Sample Statistic** **Click Here For Reference**
- Population mean

95. Given the series 1,2,1,1,2,2,2,2,3,4,5,3,2,3,1,4,2,3.Which one of the following is mode of the given series:

- 4
- 4
  3
  2
- 3
  2
  1
- 3
  2*

Note: Mode means repeating number in a series.

96. P (A or B) =P (A) +P (B), then A and B are:

- **Mutually exclusive events** **PG # 154 (Lec #19)**
- Independent events
- Exhaustive events
- Equally likely events

97. First moment about origin is always equals to:

- Mean
- Variance
- Standard Deviation
- **Zero** **PG # 119**

98. E(4X + 5) =_____

- 16 E (X)
- 16 E (X) + 5
- 12 E (X)
- **4 E (X) + 5** **PG # 192 (Lec # 25)**

99. If σ^2 is unknown, then we use Z-test if the sample size is:

- $n \geq 30$
- $n < 30$
- n=25
- n=20

100. When a coin is tossed 3 times, the probability of 3 tails is:

- **1/8**
- 2/4
- 3/8
- 2/8

101. The F-distribution has……. Parameter.

- One
- No
- **Two** **PG # 312 (Lec # 42)**
- Three

F-distribution has two parameters ν1 and ν2, which are known as the degrees of freedom of the F-distribution.

102. Which one of the following provides the basis for hypothesis testing?

- Null hypothesis
- Alternative hypothesis
- Critical value
- **Test-statistic**

103. Rumour has reached the Trading Standards Officer that the manufacturer ABC is deliberately underfilling his cartons of orange juice. It is decided that a sample should be taken to check this claim. The stated contents on the carton are 100 ml on the average, then the alternative hypothesis is:

- $H_0 : \mu = 100$
- $H_0 : \mu > 100$
- $H_0 : \mu < 100$
- $H_1 : \mu \neq 100$ **PG # 278 (Lec # 36)**

104. By definition $f(x_i|y_j)$ =_____

- $\frac{f(x_i, y_j)}{h(y_j)}$
- $\frac{f(x_i, y_j)}{h(x_i)}$
- $f(x_i, y_j)$
- $f(y_j)$

Note: The conditional function $f(x_i|y_j)$ gives the probability of the values of x_i when y = y_j, $f(x_i|y_j) = \frac{f(x_i, y_j)}{h(y_j)}$

105. Which one of the following is the most common example of a situation for which the main parameter of interest is a population proportion?

- An observational study
- A normal experiment
- A randomized experiment
- **A binomial experiment**

106. An estimator which has the smallest standard error among all unbiased estimators fulfills the property of_____

- Unbiasedness
- **Efficiency** **PG # 261 (Lec # 34)**
- Consistency
- Sufficiency

107. Which of the following can never be taken as the probability of an event?

- 1
- 0
- 0.5
- **-0.5**

Note: Probability always lie between 0 and 1

108. A set is any well-defined collection of

- Positive Objects
- Negative Objects
- Same Objects
- **Distinct Objects** **PG # 133 (Lec # 16)**

109. Measure of dispersion is used to calculate the:

- Central value
- Highest value
- Lowest value
- **Scattered value** **PG # 82**

110. If X and Y are independent variables then Var (X-Y) =

- **Var(X) – Var(Y)**
- Var(X) + Var(Y)
- Var(X+Y)
- Var(X) x Var(Y)

111. How the standard error is decreased :

- By decreasing the sample size
- By decreasing the mean
- By increasing the standard deviation
- **By increasing the sample size**

Note: The standard error decreases as the sample size increases.

112. For $\alpha = 0.01$, the critical values of z for two tailed test are equal to:

- -2.58 and+2.58
- -2.33 and+2.33
- -1.645 and +1.645
- **1.96 and + 1.96** **PG # 279 (Lec # 37)**

113. "A point estimate plus/minus a few times the standard error of that estimate". This statement represents:

- **Confidence interval** **PG # 270 (Lec # 35)**
- Critical region
- Acceptance region
- Critical value

114. The proportion of males in Pakistan is at least 0.48, the alternative hypothesis H_1 is

- $P \leq 0.48$
- $P = 0.48$
- $P < 0.48$ **PG # 278**
- $P \geq 0.48$

115. To find the confidence interval for the ratio of two variances, we use

- **F-Distribution**
- Z-Distribution
- Chi-square-Distribution
- t-Distribution

Note: Two variances:
F-distribution behind us, let's again jump right in by stating the confidence interval for the ratio of two population variances.

116. The Chi-Square distribution is continuous distribution ranging from:

- $-\infty \leq x^2 \leq \infty$
- $-\infty \leq x^2 \leq 1$
- $-\infty \leq x^2 \leq 0$
- $0 \leq x^2 \leq \infty$ **PG # 307 (Lec # 41)**

117. In a binomial experiment the total number of trials are:

- **Fixed in advance** **PG # 211 (Lec # 27)**
- Changeable according to situation
- Unpredictable
- Not independent

118. Which of the following value could not represent a coefficient of correlation?

- r = 0.99
- **r = 1.09** **PG # 128**
- r = -0.73
- r = -1

Note: r is a pure number that lies between -1 and 1 i.e. **-1< r < 1**

119. In a one way ANOVA test there are 5 observations in each of three treatments. The degrees of freedom for the treatments is:

- 5
- 3
- 1
- **2**

120. If P(B|A) = 0.25 and $P(A \cap B)$ =0.20, then P(A) =

- 0.05
- **0.80**
- 0.95
- 0.75

Note: P(B|A) = $\frac{P(A \cap B)}{P(A)}$ in that case we $\frac{P(A \cap B)}{P(B \mid A)} = \frac{0.20}{0.25} = 0.8$

121. If a random variable X denotes the number of heads when three distinct coins are tossed, the X assumed the values:

- **0,1,2,3**
- 1,3,3,1
- 1, 2, 3
- 3, 2

122. When f(x) is continuous probability function, then P(X = 2) is:

- 1
- 0.5
- **0**
- 0.25

123. Atmosphere pressure is the example of:

- Constant
- Qualitative variable
- **Quantitative variable** **PG # 8 (Lec # 1)**
- None of the above

124. Which of the following scale has true zero point?

- **Ratio Scale** **PG # 9 (Lec # 1)**
- Interval scale
- Nominal scale
- Ordinal scale

125. Given the series 1,2,1,1,2,,2,2,2,3,3,4,5,3,2,3,1,4,2,3. Which one of the following is mode of the given seires:

- 4
- 3
  3
  2
- 3
  2
  1
- 3
  2*

Note: Mode means repeating number in a series.

126. Var (4X+ 5) =_____

- 16 Var (X) may be
- 16 Var (Xj+ 5
- **4 Var (X) + 5**
- 12 Var (X)

127. The hyper geometric random variable is a(an):

- Continuous variable
- **Discrete variable**
- Undefined
- Independent variable

Note: The probability mass function of the discrete random variable *X* is called the **hypergeometric distribution**

128. Assuming that following is a probability distribution, then what is the value of 'a' :

X	1	2	3
P(X)	0.1	a	0.1

- 0.6
- **0.8**
- 0.2
- 0.4

129. If f (x, y) is bivariate probability density function of continuous random variables X and Y then marginal density function of y i.e *h(y)*is:

- $\int_{-\infty}^{\infty} f(x,y)dx$ **PG # 199**
- $\int_{-\infty}^{\infty} f(x,y)dy$
- $\int_{-\infty}^{\infty}\int_{-\infty}^{\infty} f(x,y)dx\,dy$
- $\int_{a}^{b}\int_{c}^{d} f(x,y)dy\,dx$

130. _____is a range of numbers inferred from the sample that has a certain probability of including the population parameter over the long run.

- Hypothesis
- Lower limit
- **Confidence interval**
- Probability limit

131. Test Statistics x^2 is equal to:

- $\frac{n^2S^2}{\sigma_0^2}$
- $\frac{nS^2}{\sigma_0^2}$ **PG # 309**
- $\frac{S^2}{2\sigma_0^2}$
- $\frac{n^2S^2}{2\sigma_0^2}$

132. The LSD test is applied when the null hypothesis is:

- **Rejected** **PG # 331 (Lec # 44)**
- Accepted
- Finalized
- Acknowledged

133. What is the probability of drawing a red-queen card from a well shuffled pack of 52 playing cards?

- 4/52
- **2/52**
- 13/52
- 26/52

Note: In a pack of 52 playing cards there are 2 red-queen cards

134. The probability of drawing a spade card is:

- 1/52
- 4/52
- **13/52**
- 26/52

Note: Total spade cards in pack of 52 playing card is 13.

135. In construction of a histogram, what would be taken along X-axis?

- Midpoints
- Class limits
- Class interval
- **Class boundaries**

Note: A histogram consists of a set of adjacent rectangles whose bases are marked off by class boundaries along the X-axis, and whose heights are proportional to the frequencies associated with the respective classes.

136. If you connect the mid-points of rectangles in a histogram by a series of lines that also touches the x-axis from both ends, what will you get?

- Ogive
- **Frequency polygon** **Click Here For Reference**
- Frequency curve
- Historigram

137. Which type of the curve is represented by the following shape?

- **Negatively skewed curve** **PG # 39 (Lec # 5)**
- Bell shape curve
- semi-symmetrical curve
- Positively skewed curve

138. If A = (1 , 2, 3, 4, 5 , 10) and B = {1, 3, 5} then $B \subset A$ means:

- A is less than B
- A is contained in B
- **B is contained in A.** **PG # 134 (Lec # 16)**
- B is less than A

139. What is the mode in the word STATISTICS:

- S
- T
- T
- **S and T**

Note: Most Repeated value in a data set.

140. In a symmetrical distribution, if $Q_1 = 20,\ Q_2 = 30$ *then* Q_3 *is*:

- **50**
- 40
- 30
- 10

$Q_1 + Q_2 = Q_3 + 20 + 30 = 50$

141. Which one of the following is not a included in measures of central tendency:

- **Quartile Deviation** **PG # 51 (Lec # 6)**
- Harmonic Mean
- Geometric Mean
- Arithmetic Mean

Note: Quartile Deviation is not included in measures of central tendency because in measure of central tendency (i.e. an average) indicates the location or general position of the distribution on the X axis, it is also known as a measure of location or position. Whereas **Quartile Deviation** is defined as half of the difference between the third and first quartiles.

142. The sum of deviations from mean is:

- Maximum
- Minimum
- **Zero** **PG # 86 (Lec # 10)**
- Undefined

143. Mean deviation is always:

- Less than Standard Deviation
- Greater than Standard Deviation
- Greater or equal to Standard Deviation
- **Less or equal to Standard Deviation**

144. The probability of an event always lies between:

- 0 and $-\infty$
- -1 and +1
- $-\infty$ and $+\infty$
- **0 and 1**

Note: The probability of any event lies between **0** and 1

145. The number of parameters in a Poisson distribution is (are):

- **1** **PG # 222**
- 0
- 2
- 3

The Poisson distribution has only one parameter $\mu > 0$. The parameter μ may be interpreted as the mean of the distribution.

146. The degrees of freedom for a t-test with sample size 14 is:

- 14
- **13**
- 7
- 0

Note: t-distribution with v = n – 1 degrees of freedom

147. The degrees of freedom for a t-test with sample size 6 is:

- 1
- 3
- **5**
- 7

Note: t-distribution with v = n – 1 degrees of freedom

148. In normal distribution: β_1=…….:

- 0 **PG #277 (Lec # 30)**
- 1
- 2
- 3

149. Which of the following is a measure of absolute dispersion?

- Skewness
- Mean Deviation
- **Coefficient of variation** **PG #92 (Lec # 11)**
- Kurtosis

150. An automobile is running, during the first 60 Km, at the rate of 10 Km/hr. During the second 60 Km at the rate of 30Km/hr, while during the third 60 Km its speed was 40 Km/hr. What method is more appropriate to calculate the average speed?

- Median
- Arithematic mean
- **Harmonic mean** **PG # 78 (Lec # 9)**
- Geometric mean

151. If S.D *(X)* = 5 then S.D $(\frac{2X+5}{2})$ =_____

- 5
- 10
- 15
- **7.5**

Note: 2 multiply by the value of X which is $(\frac{2X+5}{2})$ according to the calculation ans is 7.5

152. For a particular data set the Pearson's coefficient of skewness is greater then zero. What will be the shape of distribution?

- Negatively skewed
- J-shaped
- Symmetrical
- **Positively skewed** **PG # 111 (Lec # 14)**

153. Which of the following is correct option to find $P(X + Y \leq 1)$?

- f(0 , 0) + f(0,1) + f(1,2)
- f(2,0) + f(0, 1) + f(1, 0)
- f(0, 0) +f (1, 1) + f(1, 0)
- **f (0,0)+ f (0,1) + f (1,0)** **PG # 197 (Lec # 26)**

154. If a significance level of 1% is used rather than 5%, the null hypothesis is:

- More likely to be rejected
- **Less likely to be rejected** **Click Here For Reference**
- Just as likely to be rejected
- None of the above

155. The covariance of a random variable with itself is:

- Zero
- One
- **Its variance**
- Its correlation

156. For any two estimators T1 and T2, if VAR(T1) < VAR(T2), then T1 is:

- Consistent
- Unbaised
- Sufficient
- **Efficient** **PG #261 (Lec # 34)**

157. Which type of the curve is represented by the following shape?

- Bell shape curve
- semi-symmetrical curve
- Positively skewed curve
- **Negatively skewed curve** **PG # 39 (Lec # 5)**

158. Which one of the following is not a type of frequency curve?

- The symmetrical frequency curve
- The extremely skewed frequency curve
- The U-shaped frequency curve
- **Frequency polygon** **PG # 38 (Lec # 5)**

159. For positively skewed distribution

Mean…… Median…….. Mode:

- ≠
- =
- <
- >

Note: Mean is less than the median, and they are both less than the mode. The mean and the median both reflect the skewing, but the mean reflects it more so.

160. What is ' f_m ' in the formula of mode:

- First Frequency
- Last Frequency
- **Maximum Frequency**
- Minimum Frequency

161. In a set of 10 values all the values are 5, what will be the P_{50} ?

- 2
- **5** **Click Here For Reference**
- 10
- 20

162. Which of the following is true for the Poisson distribution:

- mean > variance
- mean < variance
- **mean = variance** **PG # 223 (Lec # 29)**
- mean = standard deviation

163. Under what condition would you use the paired t-test?

- When there is a single sample of data
- When the two samples of data arc independent
- **When A the two samples of data are not independent** not sure
- When there are two proportions

Note: 2-sample *t*-test treating them as independent samples, you will not be able to reject the null hypothesis. This demonstrates the importance of distinguishing the two types of samples. Also, it is wise to design an experiment efficiently whenever possible.

164. In the case of the sampling distribution of $\overline{X}$, the finite population correction factor (fpc) is:

- $\sqrt{\frac{n-N}{N-1}}$
- $\sqrt{\frac{N-1}{N-n}}$
- $\sqrt{\frac{N-n}{N-1}}$ **PG # 248 (Lec # 32)**
- $\sqrt{\frac{N-n}{N}}$

165. The collection of all the elements under study is called:

- **Population** **PG # 12 (Lec # 2)**
- Sample
- Data
- Registration

166. If E is an impossible event, then P(E)is:

- 1
- 0.15
- **0** **Click Here For Reference**
- 0.5

167. For the given set of observations 1, 4, 4, 4 and 7, which statement is true:

- *mean > median > mode*
- ***mean= median = mode***
- *mean ≠ median ≠ mode*
- *mean< median < mode*

168. Which one is the formula for calculating the variance of the t-distribution?

- $\sigma^2 = \sqrt{\frac{v}{v-2}}$
- $\sigma^2 = \frac{v^2}{v-2}$
- $\sigma^2 = \frac{v^2}{v-1}$
- $\sigma^2 = \frac{v}{v-2}$ **PG # 293 (Lec # 39)**

169. If a coin is tossed 3 times then what are the total number of sample points in the sample space?

- 3
- 8
- 6
- 4

Note: $2^3 = 8$, 2x2x2 = 8

170. Which one of the following is the class frequency?

- **The number of observations in each class**
- The difference between consecutive lower class limits
- Always contains at least 5 observations
- Usually a multiple of the lower limit of the first class

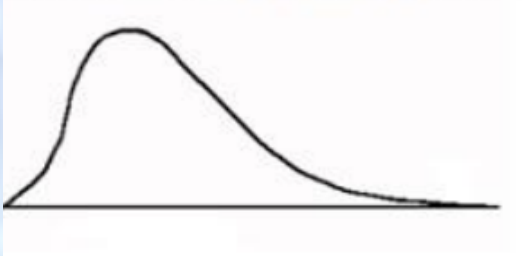
171. Which of the following scale has not true zero point?

- Nominal scale
- Ordinal Scale
- **Interval scale** **PG # 9 (Lec # 1)**
- Ratio scale

172. Data obtained from the Bureau of Statistics, is an example of:

- Primary data
- **Secondary data** **PG # 12 (Lec # 2)**
- Qualitative data
- None of these

173. What is the name of following curve?



- Symmetrical curve
- Normal curve
- Negatively skewed curve
- **Positively skewed curve** **PG # 39 (Lec # 5)**

174. The end points of a confidence interval are called:

- Confidence coefficient
- Confidence interval
- **Confidence limits**
- Parameters

175. Let X and Y are two random variables. Which property of expectation is true?

- **E(X – 3Y) = 2E(X) - 3E(Y)**
- E(2X - 3Y) = 2E(X) - 3E(Y) +E(XY)
- E(2X - 3Y) = 2E(X) + 3E(Y) -E(XY)
- E(2X -3Y) = 2E(X) - 3E(Y) - 2 E(XY)

176. The main objective of non-central distribution is:

- **To minimize variance**
- Testing of hypothesis
- To increase variance
- None of these

177. A statement about the population parameter (unknown), which may or may not be true is called

- Test statistics
- **Statistical hypothesis** **PG # 277 (Lec # 36)**
- Null hypothesis
- Alternative hypothesis

178. A Bernoulli trial has:

- At least two outcomes
- At most two outcomes
- **Two outcomes**
- Fewer than two outcomes

Note: a Bernoulli trial (or binomial trial) is a random experiment with exactly two possible outcomes, "success" and "failure".

179. If b(x, 5, 0.398), then the variance of this distribution is:

- **1.198** **Click Here For More Detail**
- 3.51
- 1.012
- 3.21

180. If the population standard deviation a is doubles, the width of the confidence interval for the population mean μ (i.e. ; the upper limit of the confidence interval-lower limit of the confidence interval) will be:

- Divided by 2
- Multiplied by
- **Double**
- Decrease

because the length of the interval is proportional to

181. If n1 = 16, n2 = 9 and a = 0.01; $t_{\frac{\alpha}{2}}$ equals:

- 2.737
- **2.807**
- **2.797**
- 3.767

182. If the population standard deviation σ is unknown and the sample size n is less than or equal to 30, the confidence interval for the population mean μ is:

- $p \pm Z_{\alpha 2}\sqrt{\frac{\hat{pq}}{n}}$
- $\overline{X} \pm Z_{\alpha 2}\frac{s}{\sqrt{n}}$
- $\overline{X} \pm t_{\alpha 2^{(v)}}\frac{s}{\sqrt{n}}$ **PG # 297**
- $\overline{X} \pm t_{\alpha 2^{(v)}}\frac{S_d}{\sqrt{n}}$

183. The number of values that are free to vary after we have placed certain restrictions upon the data is called:

- **Degrees of freedom**
- Confidence coefficient
  Confidence coefficient
- Number of parameters
- Number of samples

Note: Degree of freedom are the number of values that are free to vary after certain restrictions have been imposed on all values

184. In a hyper geometric distribution N=6 ,n=2,K=3 then means is

- 2
- 3
- **1**
- 4

Note: The mean of the distribution is equal to *n* × *k* / *N* which is 2×3/6=1

185. In a Normal distribution $N(\mu, \sigma^2), \mu_4$ is equal to

- σ_4
- $3\sigma^4$ **PG # 228**
- $\frac{3\sigma^4}{4}$
- $\frac{\sigma^4}{2}$

Note: In Normal distribution $\mu_4 = 3\sigma_4$

186. Suppose that a population has mean $\mu = 24$ what is the mean of the sampling A distribution of the mean for samples of size n=25?

- 24
- 2
- **4.8**
- 25

Note: According to formula $\frac{\mu}{\sqrt{n}}$ **=4.8**

187. In sampling with replacement the standard error of sample proportion p is equal to:

- $\frac{p(1-p)}{n}$ **Click Here For Reference**
- $\sqrt{\frac{p+q}{2}}$
- $\sqrt{\frac{p(1-p}{n}\frac{N-n}{N-1}}$
- $\sqrt{\frac{p(1-p}{n}}$

188. From point estimation, we always get:

- **Single value** **PG # 257 (Lec # 33)**
- Two values
- Range of values
- Zero

189. F-distribution is…….

- **Positively skewed** **PG # 312 (Lec # 42)**
- Negatively skewed
- Normal
- Symmetrical

190. If the outcome is an odd number when a die is rolled then what is the probability of *prime number :*

- **2/3**
- 1/3
- 1/6
- 5/6

Note: Sample space, S = {1,2,3,4,5,6}, Let A be the event of getting an odd number, Let B be the event of getting a prime number. A = {1,3,5}, B = {2,3,5}, A ∩ B = {3, 5} conditional probability of event B given that event A has already occurred, P(B|A) = P(A∩B)/P(A)=(2/6)/(3/6)=2/3

191. The sample variance $S^2 = \frac{\sum (x - \bar{x})^2}{n}$ is:

- **Unbiased estimator of** σ^2 **PG # 264 (Lec # 34)**
- Biased estimator of σ^2
- Unbiased estimator of μ
- Biased estimator of μ

192. _____are the values that make the boundaries of the confidence interval.

- Confidence intervals
- **Confidence limits**
- Levels of confidence
- Margin of error

193. If $\sum_{i=1}^{5} (X_i - 20) = 0, then \overline{X}$ …….

- **0**
- 20
- 5
- 25

194. The conditional probability is P(A|B) is given by formula:

- $\frac{P(A \cup B)}{P(A)}$
- $\frac{P(A \cap B)}{P(B)}$ **PG # 159 (Lec # 20)**
- $\frac{P(A \cap B)}{P(A)}$
- $\frac{P(A \cup B)}{P(B)}$

195. In statistics LSD is the abbreviation of…….

- Large sample difference
- **Least significant difference** **PG # 328 (Lec # 44)**
- Least significant digit
- Low speed data

196. If the random variable X denotes the number of heads when three distinct coins are tossed, then X assumes the value

- **0, 1, 2, 3** **Click Here For Reference** **PG # 167**
- 1, 3,3, 1
- 1, 2, 3
- 3 only

197. In a set of 20 values all the values are 5, what will be the mean?

- 4
- **5**
- 10
- 20

198. E(4X + 5) =_____

- 12 E (X)
- **4 E (X) + 5** **PG # 192 (Lec # 25)**
- 16 E (X) + 5
- 16 E (X)

199. Which one of the following assumptions is not a requirement for ANOVA?

- **Dependent samples**
- Normal populations
- random samples
- Independent samples

Note: assumptions for ANOVA

Each group sample is drawn from a normally distributed population

- **All populations have a common variance**
- **All samples are drawn independently of each other**
- **Within each sample, the observations are sampled randomly and independently of each other**
- **Factor effects are additive**

200. Mean is affected by the change of:

- Origin only
- Scale only
- **Origin and Scale**
- Not affected

Note: For calculating the mean, changing the origin for your data means it will affect the mean.

201. For two independent events A and B if P (A) = 0.2 and P(B) = 0.4 ,then what is $P(A \cap B)$?

- 0.06
- **0.08**
- 0.02
- 0.04

Note: $P(A \cap B) = P(A) \times P(B) = 0.2 \times 0.4 = 0.08$

202. The number of parameters in hypergeometric distribution is (are):

- 1
- 2
- **3** **PG # 219 (Lec # 28)**
- 4

203. In a symmetric distribution, what percent of values are less than the median?

- 30%
- **50%**
- 70%
- 90%

Note: Symmetric distribution also called normal distribution The mean, median, and mode of a normal distribution are equal.

204. If the probability of one event does not affected by the occurrence of another event then both events are:

- Dependent
- Not Mutually Exclusive
- Mutually Exclusive
- **Independent**

Note: Independent Events
Two events are independent if the occurrence of one does not affect the probability of the other occurring.

205. For the Poisson distribution $P(X=1)=\frac{e^{-2}2^{1}}{1!}$ the mean value is:

- 1
- **2**
- 3
- 0

206. The degrees of freedom for a t-test with sample size 10 is:

- 5
- 8
- 9
- **10**

Note: The sum of all values in the data must equal *n* x mean, where *n* is the number of values in the data set.

207. In normal distribution M.D. =

- $0.5\ \sigma$
- 0.75σ
- $\mathbf{0.7979}\sigma$
- 0.6445σ

208. _____is the standard deviation of a sampling distribution.

- **Standard error**
- Sample standard deviation
- Replication error
- Sampling error

Note: Suppose that we draw all possible samples of size *n* from a given population. Suppose further that we compute a statistics e.g., a mean, proportion, standard deviation) for each sample. The probability distribution of this statistic is called a sampling distribution. And the standard deviation of this statistic is called the standard error.

209. For what condition of k, at least $1-1/k^2$ of the data-values fall within k standard deviations of the mean:

- **Greater than 1** **PG # 94 (Lec # 12)**
- Less than 1
- Greater or equal to 1
- Less or equal to 1

210. If a player well shuffles the pack of 52 playing card then the probability of a black card from 52 playing cards is:

- 1/52
- 13/52
- 4/52
- **26/52**

Note: Total pack of playing card is 52, 26 red cards and 26 black, or 52/2=26

211. Interval estimation and confidence interval are:

- Same
- **Different** **(PG # 264 Lec # 34)**
- Opposite
- Independent

Note: We will have no way of ascertaining how close this particular is to μ .Whereas a point estimate is a single value that acts as an estimate of the population parameter, interval estimation is a procedure of estimation the unknown parameter which specifies a range of values within which the parameter is expected to lie. A confidence interval is an interval computed from the sample observation x1,x2……xn, with a statement of how confident we are that interval does contain the population parameter.

212. The average height of Pakistani solders exceeds the average height of American solders by not more than 2 inches. The alternative hypothesis H_1 is

- $\mu_P - \mu_A = 2^n$
- $\mu_P - \mu_A \geq 2^n$
- $\mu_P - \mu_A > 2^n$
- $\mu_P - \mu_A < 2^n$ **(PG # 278 Lec # 36)**

213. The proportion of working females in Pakistan is at most 0.30, the alternative hypothesis.

- $P < 0.30$ **(PG # 278 Lec # 36)**
- $P = 0.30$
- $P \leq 0.30$
- $P > 0.30$

214. For degree of freedom $v \leq 2$ the variance of t-distribution:

- Is greater than zero
- Is less than one
- Is equal to one
- **Does not exist** **PG # 294 (Lec # 39)**

215. All possible trials by throwing a dice is an example of:

- Finite population
- Infinite population
- **Hypothetical population** **PG # 12 & 13**
- Limited population

216. The sum of squares of deviations from mean is:

- Undefined
- Maximum
- **Minimum** **Click Here For Detail**
- Zero

217. The critical region for $H_1 : \mu < \mu_0$ *when* $\alpha = 0.01$ is

- $z > z_{0.01}$ **PG # 281 (Lec # 37)**
- $|z| > z_{0.01}$
- $z < -z_{0.05}$
- $|z| > z_{0.05}$

Note: Give me a feedback and your Suggestion also If you find any mistake in mcqz plz inform me Via Contact us Page on our Site. And tell me your answer with references.