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STA301 QUIZ FILE

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Subject Enrolment

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Final project (MTH620)

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STA301 FINAL TERM SOLVED MCQ's

1. A quantity obtained by applying certain rule or formula is known as Select correct option:

- **Estimator**

2. Criteria to check a point estimator to be good involves Select correct option:

- **Above**

3. The F-distribution always ranges from: Select correct option:

- **0to∞**

4. Parameter is a ..... quantity.

- **Constant**

5. To find the estimate of a parameter ..... methods are used.

- **Three**

6. A failing student is passed by an examiner. It is an example of:

- **Type II error**

7. For two mutually exclusive events A and B, P (A) = 0.2 and P (B) = 0.4, then P(AUB) is:

- **0.6**

8. 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: Select correct option:

- **Hypergeometric distribution**

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9. A standard deck of 52 cards is shuffled. What is the probability of choosing the 5 of diamonds:

- **5/52**

10. If P(AnB) = 0.12 P (A) = 0.3, find P (B) where 'A' and 'B' are independent:

- **0.4**

11. The mean deviation of the normal distribution is approximately: Select correct option:

- **4/5 the S.D**

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12. We use the Poisson approximation to the binomial when:

- **p is 0.05 Or less & n is 20 or more**

13. The conditional probability P (A\B) is:

- **P(A n B)/P(B)**

14. We use the General Rule of Multiplication to combine:

- **Events those are not independent**

15. Which statement is NOT CORRECT?

- **The sampling distribution describes how our estimate (answer) will vary if a new sample is taken**

16. Probability of an impossible event is always:

- **Greater than one**

17. The probability can never be: Select correct option:

- **-1/2**

18. The conditional probability P (A\B) is:

- **P (A n B)/P (B)**

19. A random sample of n=25 values gives sample mean 83. Can this sample be regarded as drawn from a normal population with μ= 80 and s= 7? In this question the alternative hypothesis will be:

- **H1: μ <80**

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

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- 0

21. The binomial distribution is negatively skewed when:

- p>q

22. If we roll three fair dices then the total number of outcomes is:

- 216

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23. When we draw the sample with replacement, the probability distribution to be used is:

- **Binomial**

24. The moment ratios of normal distribution come out to be:

- **0 and 3**

25. The probability of an event is always:

- **Between 0 and 1**

26. Symbolically, a conditional probability is: Select correct option:

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- P(A/B)

27. If P (A) = 0.3 and P (B) = 0.5, find P (A/B) where 'A' and 'B' are independent:

- 0.3

28. 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:

- Hypergrometric

29. If the second moment ratio is less than 3 the distribution will be:

- Platykurtic

30. For the independent events A and B if P (A) = 0.25, P (B) =0.40 then P (A and B) =……

- 0.1

31. A set of possible values that a random variable can assume and their associated probabilities of occurrence are referred to as

- Probability distribution

32. A random variable X has a probability distribution as follows: X | 0 1 2 3 P(X) | 2k 3k 13k 2k What is the possible value of;

- 0.05

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33. The probability of drawing any one spade card is: Select correct option:

- **13/52**

34. The function abbreviated to d.f. is also called the. Select correct option:

- **Probability distribution function**

35. Binomial distribution is skewed to the right if: Select correct option: p= q

- **P< q**

36. A discrete probability function f(x) is always: Select correct option: Zero

- **One**

37. For a binomial distribution, n= 10 & q= 0.6, the mean of the distribution is:

- **4**

38. In the FA examination, 24candidates offered Statistics. If the probability of passing the subject be 1/3, what will be the mean of the distribution?

- **8**

39. The probability that a certain machine will produce a defective item is 1/4. If a random sample of 6 items is taken from the output of this machine, what is the probability that there will be 5 or more defectives in the sample?

- **2187/4096**

40. Probability of type II error is

- **B (beta)**
-

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41. If the values of variables are increasing or decreasing in the same direction then such kind of correlation is referred as :

- **Perfect Correlation**

42. The best measure of variation is Select correct option: Range

- **Coefficient of variance**

43. Ms. Christian calculated a correlation coefficient of .75. Which of the following reflects the best interpretation of this?
Select correct option:

- **Strong positive.**

44. use the division of a circle into different sectors. Select correct option:

- **Sector graphs**

45. The measurement of measure of degree of to which any two variables vary together is called Select correct option:

Regression Coefficient
Correlation
Both (a) and (b)

- **None of these**

46. Analysis of Variance (ANOVA) is a test for equality of

- **variances**

47. For some data you are given Maximum value = 96 , Minimum Value = 23 , Range = 73, number of classes selected between 5 and 15 Then class width will be Select correct option:

15

8
5

- All options 1,2 ,3 are possible

48. If strength of the association between X and Y is very weak, then r = ?

- r=-1

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49. The moving averages of the Prices 90,70,30,110 are Select correct option:

- **63.33, 70**

50. With increase in sample size, distribution tends to be a.....

- **Normal**

51. In the central tendency Mean, Median and Mode

- **Mean is better than Median**

52. The degree to which numerical data tend to spread about an average is called :

- **The dispersion**

53. graphs are similar to bar graphs.

- **column**

54. A pattern of variation of a time series that repeats every year is called:

- **Seasonal**

55. You have measured the systolic blood pressure of a random sample of 22 employees of a company. A 95% confidence interval for the mean systolic blood pressure for the employees is computed to be (120,138). Which of the following statements gives a valid interpretation of this interval?

- **About 95% of the sample of employees has a systolic**

56. Assume that a population consists of 7 similar containers having the following weights (km): 9.8, 10.2, 10.4, 9.8, 10.0, 10.2, 9.6 What is the second moment about mean?

- **0.069kg**

57. How many numbers of parameter(s) are in t-distribution?

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- 1

58. With increase in sample size, distribution tends to be a.....

- Normal

59. F-distribution is a ..... distribution.

- Unimodel

60. Which one of the following sampling methods would give unbiased results, if you need to find out the number of people in your town liking vanilla or chocolate ice creams?

- Randomly select a few ice cream shops in town, and

61. A standard deviation obtained from sampling distribution of sample statistics is known as

- Standard error

62. If the regression line: Y= 3+5X meets y-axis at '8' units distance from origin then the value of x- intercept is

- 1

62. Sum of three terms whose mean is equal to 90 is

- 270

63. FREQUENCY Function calculates how often values occur within a range of values. Select correct option:

- true

64. Which of the following correlation coefficients represents the weakest correlation between two variables?

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- -1.00

65. If the value of r is 0.8 ,then the coefficient of determination is

- 80%

66. If the dependent variable increases with the independent variable then the coefficient of correlation is

- 0 to 1

67. F- distribution tends to normality, if

- Sample size is large

68. Consistency of an estimator can be checked by comparing

- Variance

69. A standardized estimate has mean and variance

- (0, 1)

70. A composite hypothesis comprises of ……

- Less than/greater

71. For a particular hypothesis test, a=0.05and B=0.05. The power of test is equal to:

- 0.95

73. In a t-distribution

- Mean=median=mode

74. If we reject the null hypothesis, we might be making

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- Type I error

75. The Central Limit Theorem is important in Statistics because it allows us to use the normal distribution to make inferences concerning the population mean:

- **Provided that the population is normally distributed and the population variance is known (for any sample size)**

76. Herbicide A has been used for years in order to kill a particular type of weed, but an experiment is to be conducted in order to see whether a new herbicide, Herbicide B, is more effective than Herbicide A. Herbicide A will continue to be used unless there is sufficient evidence that Herbicide B is more effective.
The alternative hypothesis in this problem is that

- **Herbicide B is more effective than Herbicide A**

77. A data in which we study about Regions is called ……
Select correct option: Qualitative

Geographical

78. If the median of an arrangement of numbers is equal to the mean of its middle terms then the arrangement contains Select correct option:

- **unlimited number of terms**

79. If the graph is very much scattered, then what can be the suitable value of r? Select correct option:

- **r=0.8**

80. In scatter diagram, clustering of points around a straight line indicates :

- **Curvilinear linear regression**

81. If the standard deviation of a population is 9, the population variance is Select correct option:

- 81

82. How many steps are involved in general procedure for testing hypothesis:

6

83. When testing for independence in a contingency table with 2 rows and 5 columns, there are degrees of freedom.

- r- 1*

84. The critical region is in:

- The tails of a distribution

85. T-distribution is used to test the hypothesis about.....

- Mean

86. The asymptotic distribution of t-statistic with n-degree of freedom is

- Normal

87. The value of chi square can never be :

- Negative

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

- Mean

89. We want to test H0: μ = 1.5 vs. H1: μ 6= 1.5 at _= .05. A 95% confidence interval for μ calculated from a given random sample is (1.4, 3.6)Based on this finding we:

- Cannot make any decision at all because the value of the test statistic is not available

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90. When we want to test the equality of two variances we usually use

- **F-test**

91. To find the estimate of a parameter …….methods are used.

- **Three**

91. In testing hypothesis, we always begin it with assuming that: Null hypothesis is true

- **Alternative hypothesis is true**

92. t-distribtion is applicable in case of

- **Normal populations**

93. When testing for independence in a contingency table with 3 rows and 4 columns, there are
Degrees of freedom.

- **6 (r-1)(c-1)=(3-1)(4-1)=6**

94. The location of the critical region depends upon:

- **Alternative hypothesis**

95. A random sample of n = 6 has the elements 6, 10,13,14,18 and 20. What is the point estimate of the population mean?

- **13.5**

96. ML estimators may not ……

- **Unbiased**

97. Which of the following reveals the weakest fact.

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- The measure of central tendency measures that value which depends only on the extreme values

99. The measure of central tendency measures the distance of values from means Frequency polygon is ……

- A line graph

100. A bar graph uses ……to show data.

- Bars

101. Geographical data deals with…

- Regions

102. Which one provides the basis for hypothesis testing?

- Null hypothesis

103. The test statistic to test the U1 = U2 (U represent the mean of population) for normal population for n>30.

- Z-test

104. In a t-distribution:

- Mean=median=mode

105. 1-a is the probability of .1....

- Acceptance region

106. Inferential statistics involves …….

- Testing

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107. Probability of type II error is a

- **B(beta)**

108. if the equation of regression line is y = 5, then what result will you take out from it? Select correct option:

- **The line is parallel to x-axis.**

109. If the estimating equation is Y = a – b X ,Which of the following is true

- **Slope of line is negative**

110. The variance of t-distribution, for v >2, is always:

- **Greater than one**

111. Alpha is the probability of .... Select correct option:

- **Rejecting H0**

112. What type of data is collected in population census?

- **Two Types**

113. The collection of all outcomes for an experiment is called

- **a sample space**

114. Which of the graph is used for a time series data:

- **Historigram**

115. A histogram is consists of a set of adjacent rectangles whose bases are marked off by:

- **Class boundaries**

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116. The value that has half of the observations above it and half the observations below it is known as:

- **Median**

117. The height of a student is 60 inches. This is an example of ?

- **Continuous data**

118. Range of the values -2,-3,-4,-3,-9,-2,-8,-1,0 is :

- **9**

119. If the both tails of the distribution are equal, then distribution is called:

- **Symmetrical**

120. Ranking scale also include the properties of which scale?

- **Nominal scale**

121. Range of the values -2.50,-3.70,-4.80,-3.10,-9.70,-2.20,-8.90,-1.60, 0.60 is :

- **10.30**

122. What is/are the mode for the following data: 1,m,d,n,,2,d,2,d,s,5,5,7 S

- **d**

123. If the standard deviation of a population is 5.5, the population variance is:

- **30.25**

124. What we commonly called a bell shaped distribution:

- **symmetrical**

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125. Range of the values -10,- 19, -9, -15, -28, -26, -25 is:

- **+19**

126. Which one of the following is less than median for a symmetrical distribution:

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- 4decile

127. The value of the middle term in a ranked (ordered) data set is called the

- median

128. Sum of absolute deviations of the values is least when deviations are taken from :

- mean

129. Statistic is a numerical quantity, which is calculated from

- Sample

130. The branch of Statistics that is concerned with the procedures and methodology for obtaining valid conclusions is called:

- descriptive

131. How to find the class midpoint?

- Half the sum of upper class limit and lower class limit

132. For given data, discuss the shape of the distribution: X f 0.2 8 1.2 15 2.2 23 3.2 40 :

- Negatively skewed

133. Data classified by attributes are called:

- qualitative

134. if '2' is a leading digit in 24335, than what are the trailing digits in the observation to display a 'Stem-and –Leaf display'.

- 4335

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135. A frequency polygon is obtained by plotting the class frequencies against what? Select correct option:

- **Mid Point**

136. When more values are lying at the start of the distribution, it is:

- **positive**

137. The data for an ogive is found in which distribution:

- **A cumulative frequency distribution**

138. Which one of the following is greater than median for a symmetrical distribution:

- **7th Decile**

139. Statistics deals with :

- **Aggregates of facts**
-

140. Data classified by attributes are called:

- **Qualitative data**

141. As a general rule, statisticians tends to use which of the following number of classes when arranging the data

- **Between 5 & 20**

142. The collection of all outcomes for an experiment is called

- **a sample space**

143. If P (E) is the probability that an event will occur, which of the following must be false:

- P(E)= -1

144. If we roll a die then probability of getting a '2' will be :

- 1/6
-

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145. In a multiplication theorem P (A n B) equals:

- **P (A) P (B)**

146. If Y=3X+5,then S.D of Y is equal to

- **3s.d(x)+5**

147. In regression line Y=a+bX, X is called:

- **Independent**

148. Symbolically, a marginal probability is:

- **P(A/B)**

149. Which formula represents the probability of the complement of event A:

- **1 - P (A)**

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150. If A and B are independent events with P(A) = 0.05 and P(B) = 0.65, then P(A|B) = ?

- **0.05**

151. The probability of drawing a 'white' ball from a bag containing 4 red, 8 black and 3 white balls is:

- **3/15**

Total ball= 4+8+3=15 P=3/15

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

- **Mean**

153. When we toss a fair coin 4 times, the sample space consists of….points.

- **16**

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154. 164. 5C5= ?

- **1**

155. In a probability distribution, the sum of the probabilities is equal to:

- **1**

156. The simultaneous occurrence of two events is called:

- **Joint probability**

157. Let E and F be events associated with the same experiment. Suppose the E and F are independent and that P(E) = 1/4 and P(F) = 1/2 Then P(E U F) is:

- **3/4**

158. Normal distribution is

- **Uni model**

159. The heights in centimeters of 5 students are:
165,175,176,159,170
The sample median and sample mean are respectively:

- **170,169**

160. If mean=median=mode then curve is symmetric.

- **True**

161. Distribution Function is also called the step function.

- **False**

162. In the case of sampling with replacement as well as in the case of sampling without replacement, we have:

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- True

163. The rejection region is also called the critical region.

- True

164. Mean of t-distribution will not exist when d.f (degree of freedom) will equal to:

- 1

165. Which of the following is not a criterion for a good problem situation?

- It must be dearly structured and defined

166. Which of the following statements is not an example of a continuous random variable?

- The time to failure for an electronic system

167. Consider a large population with a mean of 160 anda standard deviation of 20. A random sample of size 64 is taken from this population. What is the standard deviation of the sample mean?

- 2.500

168. Suppose 'X' is equal to the number of heads, when you throw a coin three times. The possible values of X are:

- 0,1,2,3

169. If we have f(x) = 4x $0 \leq x \leq 1$, then f(x) is a:

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- Probability density function

170. The sum of the probabilities of bivariate probabilities function f(X.Y) is ONE then what will be the value of sum of its marginal probability function f(x)?

- Will be one

171. If the second moment ratio is less than 3 the distribut on will be:

- Platykurtic

172. E(10X+3)=_____

- 10E(X)+3

173. Which of the probability distributions has three peramerters?

- Hypergeometric distribution

174. Let X and Yare TWO random variables. Which property of expectation is true?

- E(X+Y)= E(X)+E(Y)

175. If f(x) = 1/10. x = 10, then E(X) is:

- 1

176. Using the normal approximation to the binomial distribution with n= 3 and p= 0.0571 the value of meanis:

- 0.1713

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177. The mean deviation of the normal distribution is approximately:

- **4/5 of the S.D**

178. What does it mean when a data set has a standard deviation equal to zero:

- **All of the values in the data are same**

179. If the first moment ratio is equal to 0.then the distribution will be:

- **Symmetrical**

180. The two mutually exclusive outcomes in a Bernoulli trial are usually called:

- **Success and failure**

181. In a binomial experiment successive trials are:

- **Independent**

182. Which of the following Statements is not an example of a continuous random variable?

- **The time to failure for an electronic system**

183. If the sampled population has a normal distribution, when is the sampling distribution of the sample mean also a normal distribution?

- **Always**

184. If E(x) =15 then E(2X+3)=…….

- **6**

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185. We can obtain the individual probabilities of *x* and y from the joint probability function / distribution of f(x.y). Such individual probabilities are known as

- **Marginal probabilities**

186. Normal approximation to the binomial distribution is used when:

- **np>5**
- **nq>5**

- **Both of these**
-

187. We can apply binomial distribution formula, whenwe are drawing a sample from finite population without replacement and the sample size "n" not more then……of the population size N.

- **5%**

188. If E(X)=0.25 then E(2X+0)=……..

- **5**

189. In a normal distribution bow much area bes between $\mu \pm 2a$

- **95.45%**

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

- **V**

191. The value of x2can never be:

- **Negative**

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

- **Means**

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

- **3/4**

194. The critical region for *H*1 : μ < μ0 *when Alpha* = 0.05 is:

- **z > z0.05**

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

- **Non –negative**

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

- **0**

197. A random variable can be generated:

- **Manually & Mechanically**

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

- **Degree of freedom**

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

- **Dot plot**

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

- **0.6745ð**

201. 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?

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- It is a sample statistic.

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

- 0.5

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

- Harmonic Mean

204. For the independent events A and B if P (A) = 0.25, P (B) =0.40 then P (A □□B) =……

- □□□

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

- N^n

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

- f (0,0)+ f (0,1) + f (1,0)

207. The conditional probability function *f* (*x* |1) =?

- f (x,1)/ h(1)

208. In interval estimation, we always get:

- Range of values

209. Which of the following is an unbiased estimator of populations □□2 ?

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- □(x - x) 2 /(n -1)

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

- 1

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

- Either one or zero

212. If X is the mean of the n observations, then which test statistic will be used to calculate the confidence limits of the population variance □□2 ?

- x^2 statistics

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

- Positively skewed

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

- Degree of freedom

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

- 2k

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

- E(X) - E(Y)

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

- Neither X nor Y

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

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- n&p

219. The marginal p.d.f of any continuous variables is obtained by the other variable from the joint p.d.f.

- Integrating

220. In a normal distribution how much area lies between μ±*a*

- 68.26%

221. A correlation coefficient:

- tells you the direction of the slope of the scattergram

222. Which of the following is not a property of a binomial experiment?

- The probabilities of the two outcomes can change from one trial to the next

223. We can obtain the individual probabilities of x and y from the joint probability function/distribution of f{x,y). Such individual probability:

- Marginal probability

224. Assume a large distribution in which 6 = 6. What is the standard error of the mean based on samples for which n = IQ?

- 1.9

225. In a bivariate probability distribution of *X* and Y, If f(1,1}=4/157 g(1)=2/3 , h(l)=2/5, then

- X and Y are statistically independent
-

226. n binomial distribution, formula of calculating mean is:

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- μ=np

227. Which of the following is not a property of a binomial experiment?

- The probabilities of the two outcomes can change from one trial to the next

228. Poisson distributior can be used to approximate the hyper geometric distribution when;n <0.G5N, n>20 and

- P<0.05

229. The hypergeometric probability distribution has parameters:

- N,n,k

230. A random experiment is a one in which we repeat it a large number of times under similiar conditions an it produces:

- Different result

231. Giver below is the probability distribution of random variable X. What is the value of "k"

X	0	1	2	3	4
p(x)	0.5	0	2	0.07	k 0 03

- 0.20

232. Poisson distribution is never:

- Negatively skewed

233. If X and Y are independent, then Cov (X, Y) is equal to:

- 0

234. If E(x) = 3 then E(4X+3)=

- 15

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235. Which of the following is not a requirement of a binomial distribution?

- **Equally likelly outcomes**

236. If we are testing HO : mean = 250 against

HI : mean > 250 (exceeds 250) .Then rejection region will be:

- **On right side means**

237. Suppose HO: u1 < u 2 H1 :u 1> u 2 and Critical value is = 1.645 If calculated value of Z = 1 .88 then what will be your conclusion?

- **Reject H0**

238. The t-distribution can never become narrower than:

- **standard normal distribution**

239. t-distribution can be used to find the confidence interval for:

- **Population mean**

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

- **Test statistic**

241. For test of hypothesis Ho:p 1 = p 2 and HI:p1 < p2, the critical region at 0.05 level of significance and n > 30

- **Z<-1.645**

242. The test statistic to test the U1= U2 (U represent the mean of population)for normal population when n>30

- **Z- test**

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243. Suppose that the workers of factory B believe that the average income of the workers of factory A exceeds their average income; the null hypothesis will be:

- **Mean A ≤ MeanB**

244. Which of the following statements is NOT true?

- **As the degree of freedom get smaller , the t –distribution's dispersion gets smaller**

245. A is a range of numbers inferred from the sample that has a certain probability of including the population parameter over the long run:

- **Confidence interval**

246. The proportion of cigarette smokers in Pakistan is greater than 20%, the null hypothesis Ho is:

- **P≤0.20**
-

247. A null hypothesis is generally denoted by:

- **H0**

248. A deserving player was not selected in the cricket team. It is an example of:

- **Typ –I error**

249. As sample size goes up, what tends to happen to 95% confidence intervals?

- **They become more precise and narrow**

250. To determine a sample size which test we use:

- **Z**

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251. How can we interpret the 90%confidence interval for the mean of the normal population:

- **There are 90% chances of falling true value of the perametr**

252. For the smaller values of v; the t-distribution will be than the standard normal distribution:

- **More speed out**

253. If we are testing HO : mean = 50 against HI : mean < 50 then the rejection region will be:

- **on left side of mean**

254. If we are testing HO : P1 < P2(or) P1 - P2 < 0 against H1:P1 > P2{or) P1 - P2 > 0 and the tabulated value of Z = 1.645 and Z calculated value = 2.63 then what will bethe conclusion : \end{gathered} \]

- **Reject H0**

255. In Binomial distribution the sample size is considered to be sufficiently large, if both np and nq are greater than or equal to:

- **5**

256. If the NULL hypothesis says that the average height of Pakistani soldiers exceeds the average height of American soldiers by no more than 3 inches. What will be its ALTERNATIVE hypothesis?

- **P>3**

257. The critical region is computed from the value of:

- **Alpha**

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258. To test the hypothesis about the difference of means for large samples, what test statistic will be used?

- **Z**

259. When we start hypothesis testing, we always assume that:

- **H0 is true**

260. To test the hypothesis about the difference of means for small samples, test statistics will be used:

- **T-test**

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

- **0**

262. Conventionally, the probability of making a type-l error is denoted by which of the following symbol?

- **Alpha**

263. In a random sample of 500 men from Lahore city, 300 are found to be smokers: the proportion of smokers is equal to:

- **0.6**

264. If we are testing HO :P1 - P2 = 120 against HI : PI - P2 > 120 (exceeds 120) Then rejection region will be:

- **on right side of Z=0**

265. When sample size is to be considered large, population standard deviation can be replaced by:

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- Sample Standard Deviation

266. For a particular hypothesis test, Alpha= Q9 and Beta=0.03, what is The value ofType -I error?

- 0.09

267. Pairing is done only in case of observations:

- Dependent

268. How can we interpret the 90%confidence interval for the mean of thenormal population:

- There are 90%chances of falling true of the parameter

269. Alpha is the probability of:

- Committing Type- I error
- Reject HO/HO is true
- Type -I error

- All of these

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

- More likely to be rejected

271. He term 1- p is called

- Power of the test

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272. When examin ng group difference where no direction of the difference is specified, which of the following is used:

- **two-tailed test**

273. If we are testing HO: mean = 50 against H1: mean < 50 then the rejection region will be:

- **On left side mean**

274.A random sample of n=25 values gives sample mean 83Can this sample be regarded as drawn from a normal population with μ= 80 and s= 7? In this question the alternative hypothesis will b:

- **H1:μ≠80**

275. The t-test for independent samples assumes which of the following?

- **Scores are independent**

276. For a sample p1 = 0.2. n1= 100 and for secondsample p2= 0.5 and n2= 200. the pooled estimator
Pc is:

- **0.40**

277. The location of the critical region depends upon:

- **Alternative hypothesis**

278. Pairing is done only in case of observations:

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- Dependent

279. Mean of t-distribution will not exist when d.f (degree of freedom) will equal :

- 1

280. Which of the following is not a criterion for a good problem situation?

- It must be dearly structured and defined

281. Sample proportion is an/are ___ estimator of population mean.

- Unbiased

282. Which of the following is most important and most widely used method in point estimation?

- The method of maximum likelihood

283. A statistic whose standard error decreases with an increase in the sample size will be:

- Consistent

284. We can apply method of Maximum Likelihood on:

- Discrete as well as continuous variables

285. β is the probability of:

- Accept H0/H0 is false

286. Accept H0/H0 is false, is the _____.

- Type II error

287. Conventionally, the probability of making a type-II error is denoted by:

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- **Beta**

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288. _____ are equivalent:

- **Type-I error and level of significance**

289. In general, the estimators obtained by the method of moments are _____.

- **Inefficient**

290. The larger the n, the smaller the standard error, and so the narrower the:

- **Confidence interval source Google**

291. If we have the following information: p=0.16, q=0.84, z=1.96 and e=0.05, then sample size will be:

- **207 n = z2.p.q/ e2**

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

- **Confidence interval**

293. The maximum likelihood estimators (MLE) are ____ and ____ but not necessarily____.

- **Consistent, efficient, unbiased**

294. Inferential statistics involves

- **Testing of hypothesis**
- **Estimation**
- **Confidence interval**

- **All of above Lect. 36, page no. 272 handouts**

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295. Method of moments for estimation of parameters is based on the theory of

- None of the above (Not sure)

296. If Var (mean1) < Var (mean2) it implies

- Mean 1 is more efficient

297. An estimator is said to be efficient if it has

- Smallest variance

298. In binomial distribution the sample size is considered to the sufficiently large, if both np and nq are greater than or equal to:

- 5

299. Which of the following relationship exist between sampling distribution of samples mean and sampling distribution samples median?

- Var(mean)<var(median)

300. Alpha is probability of _____

- Making type I error

301. How can we interpret the 90% confidence interval for the mean of the normal population?

- There are 90% chances of falling true the value of the parameters (page no. 263 handouts)

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302. An estimator is said to be _____ if its expected value is equal to true value of its parameter.

- **Unbiased**

303. Sample proportion is a/an_____ estimator of population mean

- **Unbiased**

304. A static whose standard error decreases with an increase in the sample size will be___

- **Consistent**

305. To determine a sample size which test we use _____.

- **T**

306. If Var (T1) > Var (T2), where T1 and T2 are two unbiased estimators then;

- **T2 is more efficient**

307. The end points that bound the confidence interval are called

- **Lower and upper limits**

308. When sample size is to be considered large, population standard deviation can be replaced:

- **Sample standard deviation**

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309. The confidence intervals become wide and less precise by:

- **Decreasing sample size**

310. In a Poisson distribution, Maximum Likelihood Estimator (MLE) for meu (μ) is equal to:

- **Sample mean**

311. In a Geometric distribution, Maximum Likelihood Estimator (MLE) for proportion (p) is equal to:

- **Reciprocal of the mean**

312. In a random sample of 500 men from Lahore city, 300 are found to be the smokers, the proportion of smokers is equal to:

- **0.6**

313. Which of the following is not criterion for a good problem situation?

- **It must be clearly structured and defined (Confirmed from Riz Mughal File)**

314. The method of Maximum Likelihood (ML) is used to find out:

- **Point estimates**

315. If we draw a sample of size 'n' from a population the sample is called 'large sample' if

- **n>30**

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316. Sample mean is a/an _____ estimate of population mean

- Unbiased

317. The width of the confidence interval is called ____ of the estimate.

- Precision

318. The precision of an estimator can be increased by increasing the:

- Size of sample (Google)

319. "A failed student is passed by an examiner", is an example of:

- Type II error

320. An experiment was conducted to estimate the mean yield of a new variety of wheat. A sample of 20 plots gave a mean yield of 2.9, and a 95% confidence interval of (2.48, 3.32). This means:

- We are 95% confident that the true mean yield of this variety is between 2.48 and 3.32

321. An alternative hypothesis is generally denoted by:

- H1

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

- 0

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323. A _____ is a range of numbers inferred from the sample that has a certain probability of including the population parameter over the long run.

- **Confidence interval**

324. Conventionally, the probability of making a type-I error is denoted by which of the following symbol?

- **Alpha**

325. In interval estimation we obtained a ____ of values as an estimate of parameter.

- **Range**

326. As sample size goes up, what tends to happen to 95% confidence interval?

- **They become more precise and narrow**

327. A failing student is passed by an examiner. It is an example of:

- **Type II error**

328. The precision of an estimator can be increased by decreasing the:

- **Level of significance**

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

- **Highly peaked**

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330. A confidence interval has a specified probability _____ of containing the true value of parameter.

- **1 – α**

331. Interval estimation and Confidence interval are

- **Different**

332. From which of the following methods we can obtain point estimate of the population parameters.

- **All of the above**

333. Which of the following statements about confidence intervals is inaccurate? A confidence interval for a mean always contain the sample mean

- **If the population standard deviation increases, the confidence interval decreases in width**

334. A deserving player was not selected in the cricket team. It is an example of:

- **Type-I error**

335. An industrial designer wants to determine the average amount of time it takes an adult to assemble an "easy to assemble" toy. A sample of 16 times yielded an average time of 19.92 minutes, with a population standard deviation equal to 5.73. Assuming normality of assembly times, what is 95% (…)

- **(17.1123, 22.7277)**

336. In testing H0: μ =100 against H1: μ ≤ 100 at the 10% level of significance, H0 is rejected if:

- **100 is contained in 90% confidence interval**

337. Confidence interval is also known as:

- **None of these**

338. When an interval is constructed, what is the probability of occurrence of parameter in it?

- **Either 1 or 0**

339. The larger the standard error, the _____ the confidence interval.

- **Wider**

340. To determine a sample size in estimating population mean, we use the ____ value.

- **Z**

341. In the method of moments, how many equations are required for finding two unknown parameters.

- **2**

342. What is the rule of thumb for a sample size 'n' to be considered large?

- **n>30 or n=30**

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343. A null hypothesis is generally denoted by:

- **H0**

344. "To consider every possible value that the parameter might have, and for each value, compute the probability and THAT value of the parameter for which the probability of a given sample is greatest, is chosen as an estimate." This procedure is known as

- **The method of maximum likelihood**

345. Alpha is the probability of:

- **Type-I error**
- **Committing type-I error**
- **All of these**
- **Reject H0/H0 is true**

346. If P (6.2 < ? < 1.2) = 0.95 then

- **This is wrong statement**

347. The limitation of point estimation is that:

- **There is no way of ascertaining how close the point estimate to parameter? (Lecture no 35 Page no 259 Handouts)**

348.Tabulation is the process of arranging data into:

- **Rows and Columns**

349. A simple bar chart consists of:

- **Vertical or Horizontal bars**

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

- **No. of classes/Range**

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

- **Media**

352. For the independent events A and B if P (A) = 0.15, P (B) = 0.50 then P (A □□B) =…….

- **0.075**

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

- **Mode**

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

- **Equally likely**

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

- **Mean**

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

- **Mean**

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

- **$P(X \leq x)$**

358. In a one-way ANOVA:

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- An interaction effect can be tested

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

- n-1

360. 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:

- H0 : μ= 100

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

- C

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

- Joint distribution

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

- F- distribution

364.In normal distribution □2 =……..:

- 3

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

- 0

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

- Coefficient of variation

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367. If S.D(X) = 5 then S.D (2 *X* + 5/ 2)=……

- **7.5**

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

- **Skewness**

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

- **Correct decision**

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

- **0**

371. If the sampling distribution of *X* is normal, we would expect 99% of the sample means to be within the interval:

- **□*x* ± 2.58□ □*x***

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

- **v2 > 2**

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

- **Mean square error**

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

- **Normal distribution**

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

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

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

- **24**

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

- **0.25**

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

- **Efficient**

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

- **Consistent estimator**

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

- **Range**
-

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

- **U shape curve**

382. Which one is the measure of central tendency:

- **Average of the distribution**

383. The mean of the F–distribution is:

- $\frac{v_2}{v_2 - 2} \square\square for\ v_2 > 2$

384. The F-distribution always ranges from:

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- 0 to +∞

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

- It is bell-shaped

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

- □0.135

387. A good way to get a small standard error is to use a……

- Large sample

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

- Range

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

- Harmonic mean

390. Which one is the formula of mid range:

- $\frac{x_0+x_m}{2}$

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

- Normal

392. 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 sampling distribution

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393. By definition f(y | x)=……

- $\frac{f(X,Y)}{h(X)}$

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

- **Greater than one**

395. In the test of goodness of fit,……. the is used as a test statistic.

- x^2

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

- **7**

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

- **f(x,y)=g(x)h(y)**

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

- **Discrete uniform distribution**

399. Uniform distribution is defined by:

- **Largest and smallest value**

400. Quantitative variable is further divided into:

- **Continuous & Discrete variable**

401. Color of the dress is the example of:

- **Qualitative data**

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

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- Symmetrical

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

- 7/8

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

- Joint probability

405. What is the stem part of 243:

- 24

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

- Sample Statistic

407. 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:

- 1

3

2^*

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

- Mutually exclusive events

409. First moment about origin is always equals to:

- Zero

410. E(4X + 5) =…….

- 4 E (X) + 5

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□□□□□□□□2 is unknown, then we use Z-test if the sample size is: o o

- **n ≥30**

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

- **1/8**

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

- **Two**

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

- **Test-statistic**

415. 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:

- **H1 : μ≠ 100**

416. By definition f(xi|y j) =……

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

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

- **A binomial experiment**

418. An estimator which has the smallest standard error among all unbiased estimators fulfills the property of……..

- **Efficiency**

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

- **-0.5**

420. A set is any well-defined collection of

- **Distinct Objects**

421. Measure of dispersion is used to calculate the:

- **Scattered value**

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

- **Var(X) – Var(Y)**

423. How the standard error is decreased :

- **By increasing the sample size**

424. For □□□□0.01, the critical values of z for two tailed test are equal to:

- **1.96 and + 1.96**

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

- **Confidence interval**

426. The proportion of males in Pakistan is at least 0.48, the alternative hypothesis *H*1 is

- **P < 0.48**

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

- **F-Distribution**

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

- $0 \leq x2 \leq \infty$

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

- Fixed in advance

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

- r = 1.09

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

- 2

432. If P(B|A) = 0.25 and *P*(*A* Ç *B*) =0.20, then P(A) =……..

- 0.80

433. 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

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

- 0

435. Atmosphere pressure is the example of:

- Quantitative variable

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

- Ratio Scale

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437. Var (4X+ 5) =……..

- **4 Var (X) + 5**

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

- **Discrete variable**

439. 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:

- $\int_{-\infty}^{\infty} f(x, y)dx$

440. ……..is a range of numbers inferred from the sample that has a certain probability of including the population parameter over the long run.

- **Confidence interval**

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

- **Rejected**

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

- **2/52**

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

- **Class boundaries**

444. 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?

- **Frequency polgon**

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445. The probability of drawing a spade card is:

- **13/52**

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

- **Negatively skewed curve**

447. If A = (1 , 2, 3, 4, 5 , 10) and B = {1, 3, 5} then B□□A means:

- **B is contained in A.**

448. What is the mode in the word STATISTICS:

- **S and T**

449. In a symmetrical distribution, if *Q*1 = 20, *Q*2 = 30 *then Q*3 *is* :

- **50**

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

- **Quartile Deviation**

451. The sum of deviations from mean is:

- **Zero**

452. Mean deviation is always:

- **Less or equal to Standard Deviation**

453. The probability of an event always lies between:

- **0and 1**

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

- **13**

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

- **5**

456. In normal distribution: □1 =……

- **0**

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

- **Coefficient of variation**

458. 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?

- **Harmonic mean**

459. If S.D *(X)* = 5 then S.D (2X+5)/2=…….

- **7.5**

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

- **Positively skewed**

461. Which of the following is correct option to find *P(X +Y≤ 1)*?

- **f (0,0)+ f (0,1) + f (1,0)**

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

- **Less likely to be rejected**

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

- **Its variance**

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

- **Efficient**

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

- **Frequency polygon**

466. For positively skewed distribution : Mean…… Median…….. Mode:

- **<**

467. What is „ *fm* ‟ in the formula of mode:

- **Maximum Frequency**

468. In a set of 10 values all the values are 5, what will be the P50 ?

- **5**

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

- **mean = variance**

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

- **When A the two samples of data are not independent**

471. In the case of the sampling distribution of X , the finite population correction factor (fpc) is:

- $\sqrt{\frac{N-n}{N-1}}$

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

- **Population**

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

- **0**

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

- **mean= median = mode**

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

- **The number of observations in each class**

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

- **8**

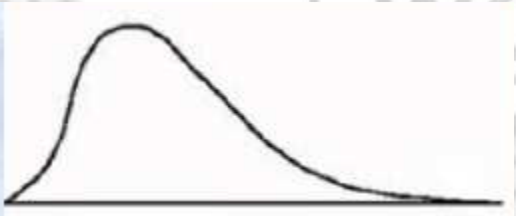
477. Which of the following scale has not true zero point?

- **Interval scale**

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

- **Secondary data**

479. what is the name of following curve?



- **Positively skewed curve**

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

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- Confidence limits

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

- E(X – 3Y) = 2E(X) - 3E(Y)

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

- To minimize variance

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

- Statistical hypothesis

484. A Bernoulli trial has:

- Two outcomes

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

- 1.198

485. 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:

- Double

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

- Degrees of freedom

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

- 1

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488. In a Normal distribution $N(\mu,\sigma^2)$, μ_4 is equal to

- $3\sigma^4$

489. Suppose that a population has mean μ= *24* what is the mean of the sampling A distribution of the mean for samples of size n=25?

- 4.8

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

- $\frac{p(1-p)}{n}$

491. From point estimation, we always get:

- Single value

492. F-distribution is…….

- Positively skewed

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

- 2/3

494. ……are the values that make the boundaries of the confidence interval.

- Confidence limits

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

- 0

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

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- $\frac{P(A \cap B)}{P(B)}$

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

- Least significant difference

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

- 5

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

- Dependent samples

500. Mean is affected by the change of:

- Origin and Scale

501. For two independent events A and B if P (A) = 0.2 and P(B) = 0.4 ,then what is P(A ∩B) ?

- 0.08

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

- 3

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

- 50%

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

- Independent

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

- **2**

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

- **□□**

507. In normal distribution M.D. =…….

- **0.7979σ**

508. …….is the standard deviation of a sampling distribution.

- **Standard error**

509. 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**

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

- **26/52**

511. Interval estimation and confidence interval are:

- **Different**

512. 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:

- **$\mu_P - \mu_A < 2^n$**

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

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- $P < 0.30$

514. For degree of freedom v £ 2 the variance of t-distribution:

- Does not exist

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

- Hypothetical population

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

- Minimum

517. The critical region for $H1 : \mu < \mu_0$ when α=0.01 is

- $z > z_{0.01}$

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

- Positively skewed

519. In measures of relative dispersion unit of measurement is:

- Vanish

520. The F-distribution always ranges from:

- 0 to+ ∞

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

- $0 \leq x^2 \leq \infty$

522. If X and Y are random variables, then $E\square X\ \square Y\ \square\square\square$is equal to:

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- E□X) □□E(Y □

523. If ŷ is the predicted value for a given x-value and b is the y-intercept then the equation of a regression line for an independent variable x and a dependent variable y is:

- ŷ =mx+b, where m=slope

523. The location of the critical region depends upon:

- Alternative Hypothesis

524. The t-Distribution is……. Spread out then the standard normal Distribution.

- More

525. To find the confidence internal for the ratio of two variances we use:

- F-distribution

526. The total number of samples when sampling is done with replacement:

- N^n

527. ANOVA was introduced by :

- R.A Fisher

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

- F

529. For testing of hypothesis about population proportion , we use:

- Z-test

530. An estimator T is said to be unbiased estimator of □□if:

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- E (T) =□

531. From point estimation, we always get:

- Single value

532. If f (x, y) is bivariate probability density function of continuous r.v.'s X and Y then $g(x)$ is:

- $\iint_{-\infty}^{\infty} f\ (x, y)dx\ dy$

533. In normal distribution Q.D =…….

- 0.6745□□

534. Which of the following is a systematic arrangement of data into rows and columns?

- Tabulation

535. The branch of Statistics that is concerned with the procedures and methodology for obtaining valid conclusions is called:

- Inferential Statistics

536. The analysis of variance technique is a method for :

- Comparing three or more means

537. The continuity correction factor is used when:

-
- A continuous distribution is used to approximate a discrete distribution

538. Stem and leaf is more informative when data is :

- Less than 100

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539. 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?

- **Frequency curve**

540. In normal distribution □□β_2□□□□□□□□□□□□□□□□□□

- □

541. Which one of the following statements is true regarding a population?

- **It must be a large number of values**

542. When *Q*1 □□2 *and* *Q*3 □□4,what is the value of Median, if the distribution is symmetrical:

- **2**

543. In a simple linear regression model, if it is assumed that the intercept parameter is equal to zero, then:

- **The slope of the line will also be equal to 0.**

544. In testing of hypothesis, we always begin it with assuming that:

- **Null hypothesis is true**

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

- **9**

546. Which one is the formula of range:

- x_m □x_0

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

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- E(X). E(Y)

548. Standard deviation of the data 7, 7, 7, 7, 7, 7, 7 is

- 0

549. When the random variable X and Y are independent, its covariance is:

- Zero

550. Which one is the poor measure of dispersion in open-end distribution?

- Range

551. Men tend to marry women who are slightly younger than themselves. Suppose that every man married a woman who was exactly 5 years younger than themselves.

- The correlation is 1

552. Which of the following is a critical value of Z when 1-$\alpha = 95\%$ for one tailed test:

- 1.96
-

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

- 5

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

- 13

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

- 13

556. For a particular hypothesis test, $\alpha = 0.05$, $\beta = 0.10$ The power of test equals to:

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- 0.90

557. In testing of hypothesis, we always begin it with assuming that:

- Null hypothesis is true

558. If a continuous probability distribution has $\beta_2 = 2.14$ then what will be peakedness of the distribution?

- Platykurtic

559. The difference between statistic and parameter is called:

- Bias

560. Mean deviation is always:

- Less or equal to S.D

561. The value of $\chi 2$ can never be:

- Negative

562. Evaluate: (9-4)!

- 120

563. Which formula represents the probability of the complement of event A:

- 1-P

564. Ideally the width of confidence interval should be:

- 0

565. If the sampling distribution of $\bar{X}$ is normal, the interval $\mu_{\bar{x}}$ □□$3\sigma_y$includes:

- 99.73% of the sample means

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566. The probability distribution of a statistic is called the:

- **Sampling distribution**

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

- **One**

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

- **Mean**

569. The*f* □*x* |1□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

- $\frac{f(x,1)}{h(x)}$

570. The area under a normal curve between 0 and -1.75 is

- **.4599**

571. The continuity correction factor is used when:

- **A continuous distribution is used to approximate a discrete distribution**

572. Which of the following is impossible in sampling:

- **Heterogeneous**

573. Which of the following is a systematic arrangement of data into rows and columns?

- **Tabulation**

574. Which one of the following statements is true regarding a sample?

- **It is a part of population**

575. The data for an ogive is found in which distribution?

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- A cumulative frequency distribution

576. 10! =…….

- 3628800

577. When E is an impossible event, then P(E) is:

- 0

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

- Degrees of freedom

579. In testing hypothesis, we always begin it with assuming that:

- Null hypothesis is true

580. For the Poisson distribution P(x) =…….

- 0.135

581. When two coins are tossed simultaneously, P (one head) is:

- ¾

582. From point estimation, we always get:

- Single value

583. When a fair die is rolled, the sample space consists of:

- 36 outcomes

584. When testing for independence in a contingency table with 3 rows and 4 columns, there are _____ degrees of freedom.

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- 6

585. The F- test statistic in one-way ANOVA is:

- MSE / MSW

586. The continuity correction factor is used when:

- A continuous distribution is used to approximate a discrete distribution

587. A uniform distribution is defined by:

- Its largest and smallest value

588. Which graph is made by plotting the mid-point and frequencies?

- Frequency polygon

589.In a set of 20 values all the values are 10, what is the value of median?

- 10

590. In an ANOVA test there are 5 observations in each of three treatments. The degrees of freedom in the numerator and denominator respectively are.....

- 2,12

591. A set that contains all possible outcomes of a system is known as:

- Universal Set

592. The number of telephone calls that pass through a switchboard has a Poison distribution with mean equal to 2 per minute. The probability that no telephone calls pass through the switchboard in two consecutive minutes is:

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- 0.0183

593. The range of the binomial distribution is:

- 0, 1, 2, …, n

594. Which of the following is NOT CORRECT about a standard normal distribution?

- (Z ≥-2.5) = .4938

595. The distribution function (df) is also known as cumulative distribution function (cdf).

- Yes

596. Which of the following pairs of events are mutually exclusive?

- A: the numbers above100; B: the numbers less than-200

597. Two events A & B are said to be independent if...

- P(A) * P(B)

598. The collection of all outcomes for an experiment is called:

- A sample spaces

599. Symbolically, a conditional probability is:

- P(A/B)

600. If one event is unaffected by the outcome of another event the two events are said to be:

- Independent

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601. Let X be a random variable with binomial distribution, that is (X=0, 1, n). The expected value E[X] is

- **np**

602. The sample mean is an unbiased estimator for the population mean. This means:

- **The average sample mean, over all possible samples, equals the population mean**

603.Probability of an impossible event is always:

- **Zero**

604. The function abbreviated to d.f. is also called the.....

- **Commutative distribution function**

605. For exhaustive events, the P(AUBUC) is equal to:

- **P(S)**

606. One card is drawn from a standard 52 card deck. In describing the occurrence of two possible events, an Ace and a King, these two events are said to be:

- **mutually exclusive**

607. If Y=bX, then variance of Y is

- **b var(x)**

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

- **3**

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

- **0**

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610. In regression line Y=a+bX, Y is called:

- **Dependent variable**

611. Probability of a sure event is

- **1**

612. If Y=3X+5, then S.D of Y is equal to

- **3s.d(x)+5**

613. If P (B|A) = 0.25 and P (A and B) =0.20, then P (A) is

- **0.80**

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

- **0.5**

Current solved paper (2021) Sta301

Question:01

Find $\hat{p}_c$ ***by using information.***

Solution:

We are given that

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$\hat{p}_1 = 0.31 \quad , \quad \hat{p}_2 = 0.24$

$n_1 = 100 \quad , \quad n_2 = 100$

$\hat{p}_c = ?$

We know that

$$\hat{p}_c = \frac{n_1 \hat{p}_1 + n_2 \hat{p}_2}{n_1 + n_2}$$

putting values,

$$\hat{p}_c = \frac{100(0.31) + 100(0.24)}{100 + 100}$$

$$\hat{p}_c = \frac{31 + 24}{200} = \frac{55}{200}$$

$$\hat{p}_c = 0.275$$

Question:02

If E(x)=0.25 then find E(2x)

Solution:

Given that ,

E(x) = 0.25

We have to find ,

E(2x) = ?

E(2x) =2E(x)

E(2x) = 2(0.25)

E(2x) = 0.5

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Question:03.

Given N=10,n=4 & k=5.then find E(x) and Var(x)

Solution:-

We know that the given data is in hypergeometric distribution.

So,

$$E(x)=\frac{nk}{N}$$

$$E(x)=\frac{4(5)}{10}=\frac{20}{10}$$

$$\Rightarrow E(x)=2$$

$$and,$$

$$Var(x)=\frac{nk}{N}\left(1-\frac{k}{N}\right)\left(\frac{N-n}{N-1}\right)$$

$$Var(x)=\frac{4(5)}{10}\left(1-\frac{5}{10}\right)\left(\frac{10-4}{10-1}\right)$$

$$Var(x)=2\left(\frac{5}{10}\right)\left(\frac{6}{9}\right)$$

$$Var(x)=\frac{6}{9}$$

$$\Rightarrow Var(x)=0.6667$$

Question:04.

Write the names of the measures of dispersion that are not based on all values?

Answer:

1) **Range.**

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2) Quartile deviation.

Question:05.

What is a poison distribution?

Answer:

A poison distribution is also known as rare events distribution.

Poison distribution is limiting form of binomial distribution under conditions.

These conditions are:

- **'n' trials are efficiently large.**
- **'p' very small →0 (approaches to 0).**
- **$0.05 \leq np \leq 20$**

The probability function of poison distribution is

$$P(X = x) = \frac{e^{-\mu}\mu^{x}}{x(\text{factorial})}$$

$$x = 0,1,2,3,.....,\infty$$

Question:06.

Write the range, parameters and formulas for hypergeometric distribution.

Answer:

Range:

The range of hypergeometric distribution is 0,1,2,⋯..n ≤ N.

Parameters:

The hypergeometric distribution has three Parameters.

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N, k, n.

Formulas:

The distribution function is

$$P(X = x) = \frac{\binom{k}{x}\binom{N-k}{n-x}}{\binom{N}{n}}$$

$$Mean = \frac{nk}{N}$$

$$Variance = \frac{nk}{N}\left(1-\frac{k}{N}\right)\left(\frac{N-n}{N-1}\right)$$

Question:07.

Write the range, parameters and formulas for binomial distribution.

Answer:

Range:

The range of binomial distribution is 0,1,2,…..,n

Parameters:

The binomial distribution have only 2 Parameters.

n, p.

Formulas:

The distribution function is

$$P(X = x) = \binom{n}{x} p^n . q^{n-x}$$

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$Mean = n.p$

$Variance = n.p.q$

Question:08

A continuous random variable X that can assume b/t x=1 and x=4 has a density function given by

F(x)=1/3.

a) ***Show that area under curve is equal to 1.***
b) ***Find p(1.5<x<3).***

Solution:

a) ***We have to show that***

$$\int_{-\infty}^{\infty} f(x)\,dx = 1$$

by putting values,

$$\int_1^4 \frac{1}{3}dx = 1 \quad , \quad \frac{1}{3}\int_1^4 dx = 1$$

$$\frac{1}{3}|x|_1^4 = 1 \quad , \quad \frac{1}{3}(4-1) = 1$$

$$\frac{1}{3}(3) = 1 \qquad \Rightarrow 1 = 1$$

proved.

b) ***We have to show that p(1.5<x<3).***

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$$p(1.5 < x < 3) = \int_{1.5}^{3} \frac{1}{3} dx$$

$$p(1.5 < x < 3) = \frac{1}{3}\int_{1.5}^{3} dx$$

$$= \frac{1}{3}|x|_{1.5}^{3} \quad , \quad = \frac{1}{3}(3 - 1.5)$$

$$= \frac{1}{3}(1.5)$$

$$\Rightarrow p(1.5 < x < 3) = 0.5$$

Proved.

Question:09.

Critical region for following hypothesis,

$H_2 : \sigma^2 = 25$, $H_1 : \sigma^2 \neq 25$

where,

$\alpha = 0.05$, $n = 25$

Solution:

Critical region

$|Z| < Z_{1-\alpha/2}$

$\Rightarrow \alpha / 2 = 0.025$

$\Rightarrow 1 - \alpha / 2 = 0.975$

$Z_{1-\alpha/2} = 1.96$

$\Rightarrow |Z| < 1.96$

Question:10.

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If E(x)=10 , E(y)=9 then find $E\left(\frac{5}{10}x+\frac{2}{6}y\right)$.

Solution:

We have to show that

$E\left(\frac{5}{10}x+\frac{2}{6}y\right)$

Now,

$=\frac{5}{10}E(\mathrm{x})+\frac{2}{6}E(\mathrm{y})$

by putting values,

$=\frac{5}{10}(10)+\frac{2}{6}(9)$

simplyfying,

$=5+3,=8$

$\Rightarrow E\left(\frac{5}{10}x+\frac{2}{6}y\right)=8$

Question:11

In a normal distribution how much data that fall in interval $\mu\pm3\sigma$.

Solution:

In normal distribution 99.73% data fall in the $\mu\pm3\sigma$ **interval .**

(we can also be written as $\mu\pm\sigma \; and \; \mu\pm2\sigma$ **and** $\mu\pm\sigma=68.27\%$, $\mu\pm2\sigma=95.45\%$**).**

Question:12

A random sample of size 12 is drawn from normal population with mean = $\mu_0=10.9$ ***and variance*** σ^2.

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If $S = 8, \bar{x} = 6.4$ ***.using information complete t-statistic.***

Solution:

As we know that

$$t = \frac{\bar{x} - \mu_0}{S/\sqrt{n}}$$

$$= \frac{6.4 - 10.9}{8/\sqrt{12}}$$

$$= \frac{-4.5}{2.309}, = -1.948$$

Question:13

Assume that X has a poison distribution with 2. Calculate P(X=2).

Solution:

As we know,

The distribution function of poison distribution is

$$P(\mathrm{X} = \mathrm{x}) = \frac{e^{-\mu}\mu^{x}}{x(\mathrm{fact})} \ldots\ldots\ldots(1)$$

Given,

Variance =2,

In poison distribution,

Variance=mean=μ=2

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$putting\ values\ in\ (1)$

$$P(X = x) = \frac{e^{-2}(2)^2}{2(fact)}$$

$$P(X = x) = \frac{(0.1353)4}{2}$$

$$P(X = x) = 0.2706$$

Question:14

Let T_1 and T_2 are two unbiased estimators, variance is $Var(T_1) = \frac{11}{9}\sigma^2 \ \ and \ \ Var(T_2) = \frac{13}{9}\sigma^2$ ***.Which estimator is more efficient and why?***

Solution:

We know that,

$$E_f = \frac{Var(T_2)}{Var(T_1)} = \frac{13\sigma^2/9}{11\sigma^2/9}$$

$$E_f = \frac{13\sigma^2}{9} \times \frac{9}{11\sigma^2} = \frac{13}{11}$$

13/11 is greater than 1.

Which shows that

Var(T_1) < Var(T_2) thus T_2 is more efficient than T_1.

Question:15

Find value of x^2 test statistic n=2.5, S^2 =3, $\sigma^2 = 18$**.**

Solution:

As we know that,

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$$x^2 = \frac{nS^2}{\sigma^2}$$

putting values,

$$x^2 = \frac{(2.5)3}{18}$$

$$x^2 = 0.4167$$

Question:16

Write the variance of hypergeometric distribution.

Ans:

$$Variance = \frac{nk}{N}\left(1-\frac{k}{N}\right)\left(\frac{N-n}{N-1}\right)$$

Question:17

find proportion of X_1 and X_2 if X_1 =300 , n_1 = 400

X_2 = 200 , n_2 = 300

Solution:

Proportion of X_1.

$$P_1 = \frac{X_1}{n_1} = \frac{300}{400} = \frac{3}{7}$$

$$\Rightarrow P_1 = 0.75 = 75\%$$

Proportion of X_2.

$$P_2 = \frac{X_2}{n_2} = \frac{200}{300} = \frac{2}{3}$$

$$\Rightarrow P_2 = 0.667 = 66.7\%$$

Question:18.

what is joint distribution?

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Solution:

The distribution of two or more random variables which are observed simultaneously when an experiment is performed is called Joint distribution.

Question:19

n = 1150 , x = 450 , P_0 = 0.39

H_0 : P_0 = 0.39 , α = 0.01

Stated hypothesis.

Solution:

1) ***Formulation:***

$H_0 = P_0 = 0.39$

$H_1 = P_0 \neq 0.39$

2) ***LOS***

α=0.01 , α/2=0.01/2=0.005,

1-α/2=0.995

3) ***Test statistic***

$$Z = \frac{X - np_0}{\sqrt{np_0q_0}}$$

$$Z = \frac{(x \pm 1/2) - np_0}{\sqrt{np_0q_0}} \ldots\ldots(A)$$

4) ***Critical region***

WORK.100%

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$$Z_{1-\alpha/2} = Z_{0.995} = 2.576$$
$$|Z|_c < 2.576$$

5) ***Calculation***

1st of all we find q_0 from the given values,

$q_0 = 1 - p_0$, $q_0 = 1 - 0.39$,
$q_0 = 0.61$

now Putting the values in eq.(A)

$$Z = \frac{(450 - 1/2) - 1150(0.39)}{\sqrt{(1150)(0.39)(0.61)}}$$

$$Z = \frac{4495 - 448.5}{16.540}$$

$$Z = \frac{1}{16.540} = 0.0604$$

$$\Rightarrow Z = 0.0604$$

6) ***Conclusion***

Since,

$$|Z|_c < 2.576$$

0.0604 < 2.576

It does not lies in rejection region. So we do not reject H_0 against H_1.

Question:20

What is the relationship b/w level of significance and critical region?

Ans:

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A critical region specifies a set of values of the test statistic for which null hypothesis is rejected.

The actual type I error that we get by using critical region it will be the level of significance.

Question:21

What is g(x) and h(y)?

Ans:

From the joint probability function for (x , y), we can obtain the individual probability functions of X and Y.

Such individual probability functions are called marginal probability function.

The marginal probability function of X :

g(x)=p(X=x)

The marginal probability function of Y :

h(y)=p(Y=y)

Question:22

Define point estimation.

Ans:

The object of point estimation is to obtain a single number from the sample of unknown true value of population parameter.

Question:23

Write 3 properties of normal distribution.

Ans:

1) Continuous distribution:

The normal probability distribution is a Continuous distribution that ranges from $-\infty$ to $+\infty$.

$R_x = \{x: -\infty < x < +\infty\}$

2) *Total distribution:*

The total area under the curve is unity.

That is $P(-\infty < x < +\infty) = 1$

3) *Symmetric distribution:*

The normal probability distribution is a Symmetric distribution.

- Mean =median=mode
- $X_{0.75} - \mu = \mu - X_{0.25}$
- $\mu_1 = \mu_3 = \mu_5 = ,\ldots\ldots\ldots , = 0$

Question:24

Why we use pooled proportion instead of individual Proportion?

Ans:

We use the pooled proportion instead of individual Proportion, because the pooled proportion estimate the standard error and individual not.

Question:25

What is difference b/w random design and random block design?

Ans:

Complete Randomized design:

A complete randomized(CR) design , which is the simplest type of the basic designs , may be defined as a design in which treatments are assigned to experimental units completely at random , that is the randomization done without any restriction.

Randomized Complete block design:

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A Randomized Complete block (RCB) design, may be defined as a design in which

I) **Experimental material is divided into groups or blocks.**
II) **Each block contains a complete set of treatments.**
III) **The treatments are assigned at random to the experimental units within restrictions.**

Question:26

How we can control type I error and type II error?

Answer:

To control type I error we can set a simple lower significance level.

While control type II error is impossible to control completely, the only possible chance to control the type II error by increasing sample size.

Question: 27

n=15, α = 95% then find $t_{\alpha/2\,;\,v}$?

Solution:

Given that

n =15 , α = 95% = 0.15

α/2 = 0.95/2 = 0.025

and,

v = n-1 = 15-1=14

so,

$t_{0.025\,;\,14}$ =2.145

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Question:28:

If TSS = 272.25 , $\sum_i \sum_j X^2 = 4953$ ***. Find (C.F) correction factor.***

Solution:

We know that

$$TSS = \sum_i \sum_j X_{ij}^2 - C.F$$

Putting values,

272.25 = 4953 - C.F

C.F = 4953 - 272.25

C.F = 4680.75

Question:29

what is relation between mean and variance in poison distribution.

Solution:

The mean and variance in the poison distribution are same i.e. μ.

Question:30

The department claim that the exceeds Rs = .2500 at the 0.05 level , then formulate null alternative hypothesis?

Solution:

Formulation

H_0 :μ < 2500

H_1 :μ > 2500

Question:31

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when expected frequency in any category is less then 5 what we use?

Solution:

If an expected frequency in any category is less than 5 , then we use Yate correction of continuity.

$$x^2 = \sum_{i=1}^{2} \frac{(|0-e|-1/2)^2}{e}$$

It is applied in the normal approximation to the binomial distribution.

Question:32.

If n=400, x=275. Then find 95% confidence interval for population proportion.

Solution:

We know that,

$$\hat{p} \pm Z_{\alpha/2}\sqrt{\frac{\hat{p}.\hat{q}}{n}} \text{.....(1)}$$

Now,

$$\hat{p} = \frac{x}{n} = \frac{275}{400} = 0.69$$

$$\hat{q} = 1 - \hat{p} = 1 - 0.69 = 0.31$$

$$1-\alpha = 0.95$$

$$\Rightarrow \alpha = 0.05 \ , \ \alpha/2 = 0.025$$

putting all values in eq.(1)

$$0.69 \pm Z_{0.025}\sqrt{\frac{(0.69)(0.31)}{400}}$$

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$0.69 \pm Z_{0.025}(0.023)$

$0.69 \pm (1.96)(0.023)$

0.69 ± 0.04508

$\Rightarrow 0.69 + 0.04508 \quad , \quad 0.69 - 0.04508$

$\Rightarrow 0.73508 \quad , \quad 0.645$

$\Rightarrow (0.645, 0.73508)$

Question:33.

Explain chi-square method.

Answer:

The chai-square distribution contains only one parameter, called the number of degree of freedom (d. f). where the term d. f represents the number of independent random variable that expresses the chai-square.

$$x^2 = \sum_{i=1}^{2} \frac{(|0-e|-e)^2}{e}$$

Question:34.

Why the statistics is called science of decision making. Explain it?

Answer:

In this it is called science of decision making because it is enabling us to establish numerical benchmarks and monitor and evaluate the progress of our policy or program.

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