STATISTICS (Final)

1. If M_d, Q, D and P stands for Median, Quartile, Decile and Percentile respectively, then which of the following relation between them is true?

   A. $M_d = Q_2 = D_6 = P_{50}$

   B. $M_d = Q_3 = D_5 = P_{75}$

   C. $M_d = Q_2 = D_4 = P_{50}$

   D. $M_d = Q_2 = D_5 = P_{50}$

2. If the first Quartile $Q_1 = 20$ and third Quartile $Q_3 = 50$, then $Q.D$ is

   A. 35

   B. 15

   C. 2.5

   D. 0.8

3. Sum of squares of the deviation is minimum when the deviations are taken from

   A. mean
   B. median
   C. mode
   D. an arbitrary value

4. When the collected data is grouped with reference to time, we have

   A. quantitative classification
   B. qualitative classification
   C. geographical classification
   D. chronological classification

5. If the lower and upper limits of a class are 10 and 40 respectively, the midpoint of the class is

A. 15

B. 12.5

C. 25

D. 30

6. For a symmetrical distribution, the coefficient of skewness is

A. $\alpha_3 = 1$

B. $\alpha_3 = 3$

C. $\alpha_3 = 0$

D. $\alpha_3 = -1$

7. Sub divided bar diagram is also called ……. diagram

A. bar diagram
B. component bar
C. Pie diagram
D. histogram

8. …………… curve is a graphical method of studying dispersion.

A. Lorenz
B. Ogive
C. Frequency
D. Histogram

9. Ogives for more than type and less than type distributions intersect at

A. mean
B. median
C. mode
D. origin

10. Histogram is suitable for the data presented as

    A. continuous grouped frequency distribution
    B. discrete grouped frequency distribution
    C. individual series
    D. all of the above

11. Extreme value have no effect on

    A. average
    B. median
    C. geometric mean
    D. harmonic mean

12. Statistical results are

    A. absolutely correct
    B. not true
    C. true on average
    D. histogram

13. Data classified according to the attributes of the subjects or item is known as

    A. quantitative
    B. qualitative
    C. geographical
    D. chronological

14. Identify the scale of measurement for the variable "Temperature"

    A. ratio
    B. interval
    C. ordinal
    D. nominal

15. Formula for coefficient of variation is

A. $C.V = \frac{S.D}{mean} \times 100$

B. $C.V = \frac{mean}{S.D} \times 100$

C. $C.V = \frac{mean \times S.D}{100}$

D. $C.V = \frac{100}{mean \times S.D}$

16. If a constant value 5 is subtracted from each observation of a set, the variance is

A. reduced by 5
B. reduced by 25
C. unchanged
D. increased by 25

17. The average of the sum of squares of the deviation about mean is called

A. variance
B. absolute deviation
C. standard deviation
D. mean deviation

18. In an experiment to determine if antibiotics increase the final dressed weight of cattle, the following were measured on animal in the study.
Sex, initial weight, weight gain, grade of meat
Where grade is recorded as (A, B or C), the scale of measurement of these variable are

A. nominal, ratio, interval, nominal
B. nominal, ratio, ratio, nominal
C. nominal, ratio, ratio, ordinal
D. ordinal, ratio, ratio, ordinal

19. The first quartile divides a frequency distribution in the ratio

A. 4:1

B. 1:4

C. 3:1

D. 1:3

20. Geometric mean of two numbers 1/16 and 4/25 is

A. 1/10

B. 1/100

C. 10

D. 100

21. Sum of deviations about mean is

A. zero
B. minimum
C. maximum
D. one

22. The correlation between the variables is unity, there is

A. some correlation
B. perfect positive correlation
C. perfect negative correlation
D. no correlation

23. Classical probability is measured in terms of

A. an absolute value
B. a ratio
C. Both absolute value and ratio
D. None of the above

24. If A and B are two events, the probability of occurrence of either A or B is given as

A. $P(A) + P(B)$

B. $P(A \cup B)$

C. $P(A \cap B)$

D. $P(A)\ P(B)$

25. The limiting relative frequency approach of probability is known as

A. Statistical Probability
B. Classical Probability
C. Mathematical Probability
D. All of the above

26. If it is known that an event A has occurred, the probability of an event E given A is called

A. Empirical probability
B. A priori probability
C. Posterior probability
D. Conditional probability

27. If an event B has occurred and it is known that $P(B)=1$, the conditional probability $P(A|B)$ is known as

A. $P(A)$

B. $P(B)$

C. One

D. Zero

28. Given that $P(A)=1/3$, $P(B)=1/4$ and $P(A|B)=1/6$, the probability $P(B|A)$ is equal to

A. 1/4

B. 3/4

C. 1/8

D. 8/3

29. For two events, E_1, E_2 if $P(E_1)=1/2$ $P(E_2)=1/3$ $P(E_1 \cup E_2)=2/3$, then $P(E_1 \cap E_2)$ is equal to

A. 1/4

B. 1/6

C. 2/5

D. 1/3

30. In tossing three coins at a time, the probability of getting at most one head is

A. 3/8

B. 7/8

C. 1/2

D. 1/8

31. If two events A and B are such that $A \subset B$ and $B \subset A$, the relation between $P(A)$ and $P(B)$ will be

A. $P(A) \leq P(B)$

B. $P(A) \geq P(B)$

C. $P(A) = P(B)$

D. $P(A) \neq P(B)$

32. The idea of posterior probability was introduced by

A. Pascal
B. Peter and Paul
C. Thomas Bayes
D. M. Loe've

33. An event consisting of those elements which are not in A is called

A. Primary event
B. Derived event
C. Simple event
D. Complementary event

34. Mean is a measure of

A. Location (central value)
B. Dispersion
C. Correlation
D. None of the above

35. Which of the following represents median?

A. First quartile
B. Fiftieth percentile
C. Sixth deciles
D. None of the above

36. A sample of underweight babies was fed a special diet and the following weight gains (lbs) were observed at the end of three month.
6.7 2.7 2.5 3.6 3.4 4.1 4.8 5.9 8.3
The mean and standard deviation are

A. 4.67, 3.82

B. 3.82, 4.67

C. 4.67, 1.95

D. 1.95, 4.67

37. Find the standard deviation of the five observations of 5,5,5,5,5.

A. 5

B. 0

C. 25

D. 3125

38. If mean and standard deviation of a data are 48 and 12 respectively, the coefficient of variation is

A. 42

B. 25

C. 28

D. 48

39. If the coefficient of kurtosis of a distribution is zero, the frequency curve may be

A. reduced by 5
B. reduced by 25
C. symmetric
D. increased by 25

40. A study based on complete enumeration is known as

A. sample survey
B. pilot survey
C. census survey
D. none of the above

41. The range of correlation coefficient is

A. 0 to ∞

B. $-\infty$ to ∞

C. 0 to 1

D. –1 to 1

42. If $Cov(X,Y)=0$, then

A. X and Y are correlated
B. X and Y are uncorrelated
C. X and Y are linearly related
D. None of the above

43. The number of possible samples of size n out of N population units without replacement is

A. $\begin{bmatrix} N \\ n \end{bmatrix}$

B. $(N)_n$

C. n^2

D. $n!$

44. Probability of drawing a unit at each selection remains same in

A. SRSWOR
B. SRSWR
C. Both A and B
D. Neither B nor A

45. A selection procedure of a sample having no involvement of probability is known as

A. Purposive sampling
B. Judgement sampling
C. Subjective sampling
D. All of the above

46. The most important factor in determining the size of a sample is

A. the availability of resources
B. purpose of the survey
C. heterogeneity of population
D. none of the above

47. Circular systematic sampling is used when

A. N is a multiple of n
B. N is a whole number
C. N is not divisible by n
D. None of the above

48. If the respondents do not supply the required information, this problem is known as

A. the problem of the non-response
B. non-sampling error
C. both A and B
D. neither A nor B

49. A population consisting of all real numbers is an example of

A. an infinite population
B. a finite population
C. an imaginary population
D. none of the above

50. Selected units of a systematic sample are

A. not easily locatable
B. easily locatable
C. not representing the whole population
D. representing the population

51. The correlation coefficient provides

A. a measure of the extent to which changes in one variable cause changes in another variable
B. a measure of the strength of the linear association between two categorical variables
C. a measure of the strength of the association (not necessarily linear) between two categorical variables
D. a measure of the strength of the linear association between two quantitative variables

52. For children between the ages of 18 months and 29 months, there is approximately a linear relationship between "height" and "age". The relationship can be represented by: $Y = 64.93 + 0.63(X)$, where Y represents height (in centimeters) and X represents age (in months). Joseph is 22.5 months old and is 80 centimeters tall. What is Joseph's residual?

A. 79.1

B. –0.9

C. 0.9

D. 56.6

53. If $\sum x = 30,\ \sum y = 42,\ xy = 199,\ \sum x^2 = 184,\ \sum y^2 = 318$ and $n = 6$, then the regression coefficient b_{xy} is

A. –0.36

B. –0.46

C. 0.26

D. 0.38

54. Men tend to marry women who are slightly younger than themselves. Suppose that every man married a woman who was exactly 0.5 of a year younger than themselves. Which of the following is correct?

A. The correlation is –0.5
B. The correlation is 0.5
C. The correlation is 1
D. The correlation is –1

55. The two lines of regression are $13x - 10y + 11 = 0$ and $2x - y - 1 = 0$, then mean of x and y series are

A. 3, –5

B. 3, 5

C. –3, 10

D. –3, –5

56. If x and y are independent variables, then two lines of regression are

A. $x = 0, \; y = 0$

B. $x = 0, \; y = \text{constant}$

C. $x = \text{constant}, \; y = 0$

D. $x = \text{constant}, \; y = \text{constant}$

57. The term ANOVA was introduced by

A. Karl Pearson
B. R.A. Fisher
C. C.R. Rao
D. Spearman

58. The precision of a design is given by the formula

A. $\frac{1}{v(\bar{x})}$

B. $v(\bar{x})$

C. $\frac{v(\bar{x})}{v(\bar{y})}$

D. $\sqrt{v(\bar{x})}$

59. The data classified according to columns, rows and varieties and arranged in a square is known as

A. RBD
B. CRD
C. Latin Square Design
D. Z^2 factorial

60. The allocation of treatments to experimental unit with equal probability is known as

A. randomization
B. replication
C. local control
D. confounding

61. Errors in the statistical model are always taken to be

A. independent

B. distributed as $N\left(0, \sigma_e^2\right)$

C. both A and B

D. neither A nor B

62. In a fixed effect model the hypothesis about the treatments under test is

A. σ_r^2

B. $r_i = 0$

C. $\sum r_i = 0$

D. None of the above

63. Replication in an experiment means

A. the number of blocks
B. total randomized design
C. purposive design
D. all of the above

64. A Latin square design possesses

A. one way classification
B. two way classification
C. three way classification
D. no way classification

65. For a joint pdf $f\left(x,y\right)$, the marginal distribution of y given $X=x$ is given as

A. $\sum_{all\ x} f\left(x,y\right)$

B. $\int_{-\infty}^{\infty} f\left(x,y\right)dx$

C. $\int_{-\infty}^{\infty} f\left(x,y\right)dx\ dy$

D. $\int_{-\infty}^{\infty}\int f\left(x,y\right)dx$

66. $E\left(Y \mid X=x\right)$ is called

A. the regression curve of X on Y
B. the regression curve of Y on X
C. both A and B
D. neither A nor B

67. The height of fathers and their sons from bivariate variables are

A. continuous variable
B. discrete variables
C. pseodu variable
D. none of the above

68. The correlation coefficient ρ between two variable X_1 and X_2 for a bivariate population in terms of moment is

A. $\frac{\mu_{22}}{\sqrt{\mu_{20}.\mu_{02}}}$

B. $\frac{\mu_{11}}{\sqrt{\mu_{20}.\mu_{02}}}$

C. $\frac{\mu_{12}}{\sqrt{\mu_{11}.\mu_{22}}}$

D. $\frac{\mu_{12}}{\sqrt{\mu_{20}.\mu_{02}}}$

69. Variance of X in a bivariate distribution of X and Y in lines of moments is represented by

A. μ_{20}

B. μ_{02}

C. μ_{11}

D. μ_{00}

70. Two random variables X and Y are said to be independent if

A. $E(XY)=1$

B. $E(XY)=0$

C. $E(XY)=E(X)E(Y)$

D. $E(XY)=\text{any constant value}$

71. If X is a random variable with mean μ, the $E(X-\mu)^r$ is called

A. variance
B. r^{th} row moment
C. r^{th} central moment
D. none of the above

72. A family of parametric distribution in which mean is equal to variance is

A. Binomial distribution
B. Gamma distribution
C. Normal distribution
D. Poisson distribution

73. The family of parametric distribution for which the mean and variance do not exist is

A. Polya's distribution
B. Cauchy distribution
C. Negative binomial distribution
D. Normal distribution

74. If a variate $X \sim \gamma(\alpha, 1)$ the pdf of X is same as that of

A. Chi-square distribution
B. Exponential distribution
C. Normal distribution
D. Weibull distribution

75. A coin is tossed 6 times. Find the number of points in the sample space

A. 12

B. 16

C. 32

D. 64

76. The mean and variance of the binomial distribution are 8 and 4 respectively. Then $P(x=1)$ is equal to

A. $\frac{1}{2^{12}}$

B. $\frac{1}{2^{4}}$

C. $\frac{1}{2^{6}}$

D. $\frac{1}{2^{8}}$

77. The Jacobian transformation $J = \begin{vmatrix} \frac{\partial x}{\partial u} & \frac{\partial y}{\partial u} \\ \frac{\partial x}{\partial} & \frac{\partial y}{\partial v} \end{vmatrix}$ is written as

A. $\frac{\partial(x,y)}{\partial(u,v)}$

B. $\frac{\partial(u,v)}{\partial(x,y)}$

C. $\frac{d(u,v)}{d(x,y)}$

D. $\frac{d(x,y)}{d(u,v)}$

78. A random variable X has $E(x)=2$ and $E(x^2)=8$. Its variance is

A. 4

B. 6

C. 8

D. 2

79. The calculated value of Chi-square is

A. always positive
B. always negative
C. can be either positive or negative
D. none of the above

80. In a box, there are 8 red, 7 blue and 6 green balls. One ball is picked up randomly. What is the probability that it is neither red nor green?

A. 1/3

B. 3/4

C. 7/19

D. 8/21

81. The Central limit Theorem states that

A. if n is large, then the distribution of the sample can be approximated closely by a normal curve
B. if n is large, and if the population is normal, then the variance of the sample mean must be small
C. if n is large, then the sampling distribution of the sample mean can be approximated closely by a normal curve
D. if n is large and if the population is normal, then the sampling distribution of the sample mean can be approximated closely by a normal curve

82. For a Poisson distribution

A. mean > variance
B. mean = variance
C. mean < variance
D. mean $\neq$ variance

83. If $X_1 \sim G(\alpha_1, \beta)$ and $X_2 \sim G(\alpha_2, \beta)$, X_1 and X_2 are independent, then $X_1 + X_2$ follows

A. Exponential distribution (β)

B. Gamma distribution $(\alpha_1 + \alpha_2, \beta)$

C. Gamma distribution $(2\alpha, 2\beta)$

D. None of the above

84. The property sufficiency of an estimator is defined by

A. R.A. Fisher
B. C.R. Rao
C. Mahalanobis
D. None of the above

85. If an estimator T_n of population parameter θ converges in probability to θ as $n \to \infty$, then T_n is said to be

A. sufficient
B. efficient
C. consistent
D. unbiased

86. Factorisation theorem for sufficiency is known as

A. Rao-Blockwell theorem
B. Cramer-Rao theorem
C. Chapman-Robins theorem
D. Neyman-Fisher theorem

87. If $x_1 x_2 \ldots . x_n$ is a random sample from a population $\frac{1}{\theta\sqrt{2\pi}} e^{-x^2/2\theta^2}$, the maximum likelihood for θ is

A. $\sum x_i / n$
B. $\sum x_i^2 / n$
C. $\sqrt{\sum x_1 / n}$
D. $\sqrt{\sum x_i^2 / n}$

88. Least square estimators under linear set up are

A. unbiased
B. UMVUE's
C. BLUE's
D. all of the above

89. If the variance of an estimator attains the Cramer-Rao lower bound, the estimator is

A. most efficient
B. sufficient
C. consistent
D. admissible

90. Simple consistency of an estimator T_n of $\tau(\theta)$ means

A. $P_\theta\left\{\left|T_n - \tau(\theta)\right| > \varepsilon\right\} = 1$

B. $\underset{n\to\infty}{lt} P_\theta\left\{\left|T_n - \tau(\theta)\right| < \varepsilon\right\} = 1$

C. $\underset{n\to\infty}{lt} P_\theta\left\{\left|T_n - \tau(\theta)\right| < \varepsilon\right\} = 0$

D. All of the above

91. The value of coefficient of contingency lies between

A. 0 and ∞

B. 0 and 1

C. 0 to 100

D. –1 and +1

92. For a sample of n individuals formula for coefficient of contingency is

A. $C = \sqrt{\dfrac{\chi^2}{\chi^2 + (n-1)}}$

B. $C = \sqrt{\dfrac{\chi^2}{n\chi^2}}$

C. $C = \dfrac{\chi^2}{\chi^2 + n}$

D. $C = \sqrt{\dfrac{\chi^2}{\chi^2 + n}}$

93. The decision criteria in SPRT depends on the function of

A. Type I error
B. Type II error
C. Type I and II error
D. None of the two types of error

94. The value of statistic χ^2 is zero iff

A. $\sum_i O_i = \sum_i E_i$

B. $O_i = E_i$ for all I

C. E_i is large

D. All of the above

95. In testing the equality of several population means by F test, one of the assumptions is

A. population are continuous
B. population variance are homogeneous
C. population are correlate
D. all of the above

96. If $x_1 x_2 .... x_n$ be a random sample from an infinite population where $S^2 = \frac{1}{n}\sum_i \left(x_i - \overline{x}\right)^2$, the unbiased estimator for the population variance σ^2 is

A. $\frac{1}{n-1}s^2$

B. $\frac{1}{n}s^2$

C. $\frac{n-1}{n}s^2$

D. $\frac{n}{n-1}s^2$

97. Level of significance is the probability of

A. Type I error
B. Type II error
C. Not committing error
D. All of the above

98. Which of the following is not a necessary assumption underlying the use of the analysis of variance technique?

A. The samples are independent and randomly selected.
B. The populations are normally distributed.
C. The variances of the populations are the same.
D. The means of the populations are equal.

99. One of the assumptions of analysis of variance is that the population from which the samples are drawn is

A. Binomial
B. Poisson
C. Chi-square
D. Normal

100. The component of time-series attached to long term variation is termed as

A. Secular Trend
B. Seasonal Variation
C. Irregular Variation
D. Cyclic Variation

101. A time series consists of

A. two components
B. three components
C. four components
D. five components

102. The terms prosperity, recession, depression and recovery are in particular attached to

A. secular trend
B. seasonal fluctuations
C. cyclic movements
D. irregular variations

103. An additive model of time series with the components T, S, C and I is

A. $Y = T + S + C \times I$

B. $Y = T + S \times C \times I$

C. $Y = T + S + C + I$

D. $Y = T \times S + C \times I$

104. The equation $Y = \alpha\beta^{\gamma^x}$ stands for

A. Gompertz curve
B. Exponential curve
C. Both A and B
D. Neither A nor B

105. A trend is linear iff

A. growth or decay rate is constant
B. growth or decay follow geometric law
C. change is constant in the beginning but steps after some time
D. none of the above

106. Consumer price index is also known as

A. value index
B. cost of living index
C. quantity index
D. price index

107. Control charts in SQC are meant for

A. describing the pattern of variations
B. checking whether the variability in the product is within the tolerance limits or not
C. uncovering whether the variability in the product is due to assignable causes or not
D. all of the above

108. Chance or random variation in the manufactured product is

A. controllable
B. not controllable
C. both A and B
D. none of the above

109. A process is said to be out of control, if

A. the control chart cannot be prepared
B. all the points in the control chart are within control limits
C. all points in the control chart are above lower control limits
D. all points in the control chart are below the upper control limits

110. The probability of accepting a lot with fraction defective p_t is known as

A. Consumer's risk
B. Type II error
C. Producer's risk
D. Sampling error

111. The graph of the proportion of defectives in the lot against average sample number is

A. OC curve
B. ASN curve
C. Power curve
D. Lorentz curve

112. The curve showing the probability of accepting a lot is known as

A. OC curve
B. ASN curve
C. Compertz curve
D. AQL curve

113. In a sequential probability ratio test, the criterion for acceptance of the lot with usual notation is

A. $\lambda_m \leq \frac{\beta}{1-\alpha}$

B. $\lambda_m \geq \frac{\beta}{1-\alpha}$

C. $\lambda_m \leq \frac{1-\beta}{\alpha}$

D. $\lambda_m \geq \frac{1-\beta}{\alpha}$

114. When the lot contains all defectives, the OC function for $p = 1$ is

A. $L(p) = 0$

B. $L(p) = 1$

C. $L(p) = -\infty$

D. $L(p) = \infty$

115. In a sequential decision problem the total space is divided into …….. regions

A. two
B. three
C. four
D. one

116. In transportation problem, optimal solution can be obtained by using

A. north west corner rule
B. least cost method
C. Modi method
D. Matrix method

117. Mean or average number of items served per time period is called

A. mean service rate
B. mean arrival rate
C. average rate
D. none of the above

118. In M/M/1 model the number of server is

A. 1
B. M
C. 2
D. none of the above

119. The sampling inspection plan resulting into the lowest ASN curve is

A. worst
B. best
C. not determined
D. unexamined

120. Type B OC curve usually evaluate

A. consumer's risk
B. producer's risk
C. process risk
D. product risk

121. Bivariate normal distribution is also named as

A. Bravais distribution
B. Lalpace-Gauss distribution
C. Gaussian distribution
D. Laplace distribution

122. Which of the following statements is true?

A. An LPP has a basic feasible solution, if it has feasible solution
B. An LPP always has a feasible solution
C. An LPP has a unique optimal solution, if it has a feasible solution
D. None of the above

123. Control charts in SQC are meant for

A. describing the pattern of variantsions
B. checking whether the variability in the product is within the tolerance limits or not
C. uncovering whether the variability in the product is due to assignable causes or not
D. all of the above

124. The value of correlation ratio varies from

A. -1 to 0
B. -1 to 1
C. 0 to 1
D. 0 to ∞

125. If μ and σ are the process mean and S.D, then the control limits

A. modified control limits
B. natural control limits
C. specified control limits
D. none of the above

126. Which one of the following is not a property of Binomial experiment?

A. The experiment consists of a sequence of trials
B. Outcome is either a success or failure
C. Probability of success and failure change from trial to trial
D. Trials are independent

127. The measure of location most likely to be affected by extreme observations is

A. range
B. mean
C. median
D. mode

128. Which one of the following variable is not a categorical variable?

A. Age of a person
B. Gender
C. Choice of answer in multiple choice test
D. Marital status

129. If X is the number of successes in 10 Bernoulli trials, then X has

A. Normal distribution
B. Poisson distribution
C. Binomial distribution
D. Exponential distribution

130. One use of a regression of Y on X is

A. to predict the value of X
B. to describe the association of X and Y
C. to estimate the parameters
D. to predict the value of Y for given value of X

131. For the following probability distribution $P(-2)=0.3$; $P(0)=0.15$; $P(2)=0.45$ and $P(4)=0.1$, what is $E(X)$?

A. 1.00

B. 0.70

C. 1.08

D. 1.20

132. If X and Y are random variables with $E(X)=5$ and $E(Y)=8$, then $E[3X+3Y]$ is

A. 35

B. 28

C. 39

D. 40

133. Which of the following is not a characteristic of a Normal distribution?

A. It is a symmetric distribution
B. The mean is always zero
C. It is a bell shaped distribution
D. Mean, Median are the same

134. Which of the following distribution is suitable to model the length of time that elapses before the first employee comes to office?

A. Normal
B. Poisson
C. Uniform
D. Exponential

135. If $X \sim U(15,19)$ (uniformly distributed) what is the variance of X?

A. 3

B. 1.3

C. 2.1

D. 0.86

136. A point estimator is defined as

A. the average of sample values
B. a single value that is the best estimate of a population parameters
C. a statistics to estimate a sample statistic
D. none of the above

137. A 95% confidence interval for mean is given by (8, 16). If the interval is changed to 90%, the interval will

A. become narrower
B. remain the same
C. become wider
D. increase 5%

138. Inferential statistics is the

A. process of using parameter for taking samples
B. procedure that helps researchers to find population values
C. process that describes a sample
D. process of using sample statistics to estimate population parameters

139. Two events A and B are mutually exclusive. Then

A. they are independent
B. they are independent if $P(A) > 0$ and $P(B) > 0$
C. they are not independent
D. none of the above

140. Two cards are drawn successively from a pack of 52 cards without replacing the first card. What is the probability that both of them are of the same colour?

A. $\frac{26}{51}$

B. $\frac{25}{51}$

C. $\frac{13}{51}$

D. $\frac{21}{52}$

141. In a test consisting of multiple choice questions having 4 alternatives a student knows the answer with probability $\frac{1}{2}$. Given that he answers a question correctly, what is the probability that he knew the answer?

A. 1

B. $\frac{3}{5}$

C. $\frac{2}{5}$

D. $\frac{1}{2}$

142. A two dimensional random variable (X,Y) has a bivariate distribution given by $P(X = x,\ Y = y) = \frac{x^2 + y}{32},\ x = 0,1,2,3$ and $y = 0,1$. What is the marginal distribution of Y?

A. $\frac{1}{2},\frac{1}{2}$

B. $\frac{15}{32},\frac{17}{32}$

C. $\frac{7}{16},\frac{9}{16}$

D. 0, 1

143. Suppose the correlation coefficient between X and Y is 1. Which of the following relations is true?

A. $Y = \alpha X$
B. $Y = a + bX^2$
C. $Y = \alpha e^x$
D. $Y = A.B^X$

144. If X and Y are Poisson variables with mean μ and λ respectively

A. XY is Poisson

B. $X+Y$ is Poisson

C. X/Y is Poisson if X and Y are independent

D. $X+Y$ is Poisson if X and Y are independent

145. The meantime taken by students from 4 schools a, b, c, d to run a distance are equal with coefficient of variation 5.8, 6.9, 4.3, 7.2 respectively. If a student is to be selected at random for a tournament, which school is to be chosen to select the student?

A. a
B. b
C. c
D. d

146. Given X is a random variable with finite variance and $Y=(100-X)$, what is the correlation coefficient between $Z=(X+Y)X$ and X?

A. –1

B. 0

C. 0.1

D. 1.0

147. A random sample $x_1, x_2, \ldots x_n$ is taken from $N(\mu, \sigma^2)$ with σ^2 known. Which among the following are statistics?

(1) $\sum x_i^2$ (2) $\sum x_i^2 / \sigma^2$ (3) $\sum (x_i - \mu^2)$ (4) $\sum \frac{(x_i - \mu^2)}{\sigma^2}$

A. (1) and (2) only
B. (1), (2) and (3)
C. (3), (4)
D. All

148. The correlation coefficient of husbands and wife at the time of marriage with 100 coups is 0.71. All of them survive and celebrate silver jubilee of their marriage. What is the correlation coefficient of their ages now?

A. Less than .72
B. Greater than .72
C. Equal to .72
D. 1

149. Given N values, the geometric mean is

A. the third root of product of N observations
B. square root of product of N observation
C. root of product of the inverse of N observations
D. the N^{th} root of the product of N observations

150. A statistics is function of

A. population parameters
B. observations from the population
C. observations from a sample of observations
D. none of the above

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