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OMR Sheet)

प्रश्नपुस्तिका क्रमांक
Question Booklet No.

O.M.R. Serial No.

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प्रश्नपुस्तिका सीरीज
Question Booklet Series

A

B.Sc.-Part-I (Second Semester) Examination, July-2022

B060201T

Statistics

[Descriptive Statistics (Bivariate) and Probability Distribution]

Time : 1:30 Hours

Maximum Marks-100

जब तक कहा न जाय, इस प्रश्नपुस्तिका को न खोलें

- K-256**
- निर्देश : –
1. परीक्षार्थी अपने अनुक्रमांक, विषय एवं प्रश्नपुस्तिका की सीरीज का विवरण यथास्थान सही- सही भरें, अन्यथा मूल्यांकन में किसी भी प्रकार की विसंगति की दशा में उसकी जिम्मेदारी स्वयं परीक्षार्थी की होगी।
 2. इस प्रश्नपुस्तिका में 100 प्रश्न हैं, जिनमें से केवल 75 प्रश्नों के उत्तर परीक्षार्थियों द्वारा दिये जाने हैं। प्रत्येक प्रश्न के चार वैकल्पिक उत्तर प्रश्न के नीचे दिये गये हैं। इन चारों में से केवल एक ही उत्तर सही है। जिस उत्तर को आप सही या सबसे उचित समझते हैं, अपने उत्तर पत्रक (O.M.R. ANSWER SHEET) में उसके अक्षर वाले वृत्त को काले या नीले बाल प्वाइंट पेन से पूरा भर दें। यदि किसी परीक्षार्थी द्वारा किसी प्रश्न का एक से अधिक उत्तर दिया जाता है, तो उसे गलत उत्तर माना जायेगा।
 3. प्रत्येक प्रश्न के अंक समान हैं। आप के जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
 4. सभी उत्तर केवल ओ०एम०आर० उत्तर पत्रक (O.M.R. ANSWER SHEET) पर ही दिये जाने हैं। उत्तर पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
 5. ओ०एम०आर० उत्तर पत्रक (O.M.R. ANSWER SHEET) पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाय।
 6. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी ओ०एम०आर० शीट उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें।
 7. निगेटिव मार्किंग नहीं है।

महत्वपूर्ण : – प्रश्नपुस्तिका खोलने पर प्रथमतः जाँच कर देख लें कि प्रश्नपुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्ष निरीक्षक को दिखाकर उसी सीरीज की दूसरी प्रश्नपुस्तिका प्राप्त कर लें।

Rough Work / रफ कार्य

1. In a method of least squares, the sum of squares of residuals are :
 - (A) Maximised
 - (B) Minimised
 - (C) Zero
 - (D) None of the above

2. By method of least squares, if number of equations is less than the number of unknowns then :
 - (A) Most plausible values can be obtained
 - (B) Infinite solution can be obtained
 - (C) Unique solution can be obtained
 - (D) None of the above

3. A Linear curve is defined as :
 - (A) $Y = a + bX$
 - (B) $Y = a + \frac{b}{X}$
 - (C) $Y = a + bX + cX^2$
 - (D) All of the above

4. Given $(x_1, y_1), (x_2, y_2), \dots, (x_n, y_n)$, best fitting data to $y = f(x)$ by least squares requires minimization of :
 - (A) $\sum_{i=1}^n [y_i - f(x_i)]$
 - (B) $\sum_{i=1}^n |y_i - f(x_i)|$
 - (C) $\sum_{i=1}^n [y_i - f(x_i)]^2$
 - (D) $\sum_{i=1}^n [y_i - \bar{y}]^2, \bar{y} = \frac{\sum_{i=1}^n y_i}{n}$

5. $y = ab^x$ is a :
 - (A) Exponential curve
 - (B) Logistic curve
 - (C) Gompertz curve
 - (D) None of the above

6. The function $Y = a + bX + cX^2 + dX^3$ represents :
- (A) A hyperbola
 - (B) A exponential curve
 - (C) A parabola
 - (D) All of the above
7. The equation $Y = \alpha\beta^{-X}$ for $\beta < 1$ represents :
- (A) Exponential growth curve
 - (B) Exponential decay curve
 - (C) A parabola
 - (D) None of the above
8. For fitting the curve $Y = a + bX + cX^2$, we have :
- (A) Two normal equations
 - (B) Three normal equations
 - (C) Four normal equations
 - (D) None of the above
9. The term regression was introduced by :
- (A) R.A. Fisher
 - (B) Karl Pearson
 - (C) Sir Francis Galton
 - (D) None of the above
10. If X and Y are two variates, there can be at most :
- (A) One regression line
 - (B) Two regression lines
 - (C) Three regression lines
 - (D) An infinite number of regression lines
11. Regression equation is also named is :
- (A) Prediction equation
 - (B) Estimating equation
 - (C) Line of average relationship
 - (D) All of the above

12. For estimating value of variable of X :
- (A) Regression equation of Y on X is used
 - (B) Regression equation of X on Y is used
 - (C) Both regression equations of Y on X and X on Y are used
 - (D) None of the above
13. Scatter diagram of the variate values (X,Y) gives the idea about :
- (A) Functional relationship
 - (B) Regression model
 - (C) Distribution of errors
 - (D) None of the above
14. The dots of scatter diagram follow some path, this path may be :
- (A) A line
 - (B) A curve
 - (C) A function
 - (D) Both (A) and (B)
15. The range of the correlation coefficient is :
- (A) $(-1, 1)$
 - (B) $[-1, 1]$
 - (C) $(0, 1)$
 - (D) None of the above
16. In the regression line $Y = \alpha + \beta X$, β is called the :
- (A) Slope of the line
 - (B) Intercept of the line
 - (C) Both (A) and (B)
 - (D) Neither (A) nor (B)
17. Which of the following can not be the possible value of a correlation coefficient ?
- (A) $r = 1.99$
 - (B) $r = 0$
 - (C) $r = -0.73$
 - (D) $r = -1.0$

18. Which of the following indicates a strong negative correlation ?
- (A) $r = -0.793$
 - (B) $r = -0.846$
 - (C) $r = 0.913$
 - (D) $r = 0.45$
19. In a scatter diagram, all the points lie on a rising straight line. It is indication of :
- (A) Perfect positive correlation
 - (B) Perfect negative correlation
 - (C) No correlation
 - (D) None of the above
20. The correlation measures the strength and direction of the nonlinear relationship between two variables :
- (A) Totally True
 - (B) Totally False
 - (C) Partially True
 - (D) Partially False
21. In the regression line $Y = \beta_0 + \beta_1 X$, β_0 is the :
- (A) Slope of the line
 - (B) Intercept of the line
 - (C) Both (A) and (B)
 - (D) Neither (A) nor (B)
22. If β_{YX} and β_{XY} are two regression coefficients, they have :
- (A) Same sign
 - (B) Opposite sign
 - (C) Either same or opposite signs
 - (D) Nothing can be said

23. If $\beta_{YX} > 1$, then β_{XY} is :
- (A) Less than 1
 - (B) Greater than 1
 - (C) Equal to 1
 - (D) Equal to 0
24. The lines of regression intersect at the point :
- (A) (X, Y)
 - (B) (\bar{X}, \bar{Y})
 - (C) $(0, 0)$
 - (D) $(1, 1)$
25. Given the two lines of regression as, $3X - 4Y + 8 = 0$ and $4X - 3Y = 1$, the means of X and Y are :
- (A) $\bar{X} = 4, \bar{Y} = 5$
 - (B) $\bar{X} = 3, \bar{Y} = 4$
 - (C) $\bar{X} = \frac{4}{3}, \bar{Y} = \frac{5}{4}$
 - (D) None of the above
26. If $4x - 5y + 33 = 0$ and $20x - 9y = 107$ are the two regression lines, then the correlation coefficient between x and y is :
- (A) $\frac{4}{5}$
 - (B) $\frac{9}{20}$
 - (C) $\frac{3}{5}$
 - (D) None of the above
27. The correlation coefficient between X and Y is zero, then the angle between two regression lines is :
- (A) 0°
 - (B) 45°
 - (C) 30°
 - (D) 90°

28. If S.D. of X is 25, coefficient of correlation is 0.2 and S.D. of Y is 10, then regression coefficient of X on Y will be :
- (A) 0.8
(B) 2.5
(C) 0.5
(D) 5.0
29. Rank correlation was found by
- (A) Galton
(B) Spearman
(C) Fisher
(D) Pearson
30. Rank correlation is superior method of analysis in case of _____ distribution.
- (A) Qualitative
(B) Quantitative
(C) Frequency
(D) None of the above
31. Maximum value of rank correlation coefficient is :
- (A) 0
(B) +1
(C) -1
(D) None of the above
32. Spearman's rank correlation coefficient is given by :
- (A) $1 + \frac{6 \sum d_i^2}{n(n^2-1)}$
(B) $1 - \frac{6 \sum d_i}{n(n^2-1)}$
(C) $1 - \frac{6 \sum d_i^2}{n(n^2-1)}$
(D) $1 + \frac{6 \sum d_i}{n(n^2-1)}$

33. In Spearman rank correlation coefficient, the maximum value of $\sum d_i^2$ in case of untied rank is :
- (A) $\frac{1}{2}(n^2 - 1)$
 - (B) $\frac{1}{4}n(n^2 - 1)$
 - (C) n
 - (D) $\frac{1}{3}n(n^2 - 1)$
34. Measures of association usually deal with :
- (A) Attributes
 - (B) Quantitative factors
 - (C) Variables
 - (D) Numbers
35. The notation (ABC) represents :
- (A) Combination of the attributes A, B and C
 - (B) Cell in a contingency table
 - (C) The frequency of the class ABC
 - (D) None of the above
36. The frequency of a class can always be expressed as a sum of frequencies of :
- (A) Lower order classes
 - (B) Higher order classes
 - (C) Zero order classes
 - (D) None of the above
37. With two attributes one can have in all :
- (A) Two class frequencies
 - (B) Four class frequencies
 - (C) Eight class frequencies
 - (D) Nine class frequencies

38. In case of two attributes A and B, the ultimate class frequencies are :
- (A) (AB), (Ab)
 - (B) (AB), (ab)
 - (C) (AB), (aB)
 - (D) (AB), (Ab), (aB), (ab)
39. Attributes A and B are positively associated if :
- (A) $(AB) = \frac{(A) \times (B)}{N}$
 - (B) $(Ab) > \frac{(A) \times (B)}{N}$
 - (C) $(AB) > \frac{(A) \times (B)}{N}$
 - (D) $(AB) \leq \frac{(A) \times (B)}{N}$
40. If there is perfect positive association between the two attributes Q would be :
- (A) -1
 - (B) +0.99
 - (C) +1
 - (D) 0
41. If (A)=55, (B)=70, N=100 then the lowest value of (AB) can be :
- (A) 0
 - (B) 55
 - (C) 25
 - (D) None of the above
42. Coefficient of contingency is a measure of :
- (A) Independence of attributes
 - (B) Dependence of attributes
 - (C) Correlation
 - (D) All of the above

43. A measure related to coefficient of contingency is :
- (A) Yule's coefficient
 - (B) Coefficient of correlation
 - (C) Tschuprow's coefficient
 - (D) All of the above
44. If for two attributes A and B, $N=140$, $(A)=100$, $(b)=105$, $(AB)=25$, the attributes A and B are :
- (A) Dependent
 - (B) Positively associated
 - (C) Negatively associated
 - (D) Independent
45. For a 3×3 contingency table, the degrees of freedom is :
- (A) 9
 - (B) 4
 - (C) 3
 - (D) 6
46. The geometric mean of the two regression coefficient β_{YX} and β_{XY} is equal to :
- (A) r
 - (B) r^2
 - (C) 1
 - (D) None of the above

47. Correlation coefficient was invented in the year :
- (A) 1910
 - (B) 1890
 - (C) 1908
 - (D) None of the above
48. If there are tied ranks in the data from two variables, what test should be used to examine the relationship between them ?
- (A) Spearman's correlation
 - (B) Pearson's correlation
 - (C) Kendall's Tau-b
 - (D) Biserial correlation
49. The straight line $Y = a + bX$ is fitted by the method of least squares from the data given below -
- $X = 1 \quad 2 \quad 3$
 $Y = 3 \quad 6 \quad 9$
- The value of b is :
- (A) 0
 - (B) 1
 - (C) 2
 - (D) 3
50. If the sum of squares of difference of ranks of 6 candidates in two criteria is 21, the rank correlation coefficient is :
- (A) 0.5
 - (B) 0.6
 - (C) 0.4
 - (D) 0.7

51. The outcomes of an experiment classified as success A or \bar{A} failure will follow a Bernoulli distribution *iff* :
- (A) $P(A) = \frac{1}{2}$
 - (B) $P(A) = 0$
 - (C) $P(A) = 1$
 - (D) $P(A)$ remains constant in all trials
52. The mean of binomial distribution is :
- (A) p
 - (B) np
 - (C) npq
 - (D) p^2
53. In case of binomial distribution we see that :
- (A) *mean* $>$ *variance*
 - (B) *mean* $<$ *variance*
 - (C) *mean* = *variance*
 - (D) None of the above
54. If for a binomial distribution, $b(n, p)$, $n = 4$ and also $P(X = 2) = 3P(X = 3)$, the value of p is :
- (A) $\frac{9}{11}$
 - (B) 1
 - (C) $\frac{1}{3}$
 - (D) None of the above
55. The moment generating function of Bernoulli distribution is :
- (A) $(q + pe^t)^n$
 - (B) $(q + pe^t)^{-n}$
 - (C) $(q + pe^t)$
 - (D) $(q + pe^{-t})$

56. Probability mass function for a binomial distribution with usual notations is :

(A) $\binom{n}{X} p^n q^{n-X}$

(B) $\binom{n}{X} p^n q^X$

(C) $\binom{n}{X} p^{n-X} q^X$

(D) $\binom{n}{X} p^X q^{n-X}$

57. The probability of hypergeometric variate X, with usual notations, is given as :

(A) $\binom{K}{X} \binom{N-K}{n-X} / \binom{N}{n}$

(B) $\binom{n}{K} \binom{N-K}{n-X} / \binom{N}{n}$

(C) $\binom{K}{X} \binom{N-K}{n-X} / \binom{N}{n}$

(D) $\binom{n}{X} \binom{n-K}{n-X} / \binom{N}{n}$

58. The probability mass function for the negative binomial distribution with parameters r and p is :

(A) $\binom{X+r-1}{r-1} p^r q^X$

(B) $\binom{-r}{X} (-1)^X p^r q^X$

(C) $\binom{-r}{X} p^r (-q)^X$

(D) All the above

59. For a poisson distribution $P(X = x) = \frac{e^{-3} 3^x}{x!}$, $x = 0, 1, 2, \dots$ the mean is :

(A) 6

(B) 1.5

(C) 3

(D) None of the above

60. For a poisson distribution $P(1) = P(2)$ then its variance is :
- (A) 3
(B) 4
(C) 6
(D) 2
61. The recurrence relation between $P(x)$ and $P(x + 1)$ in a poisson distribution with parameter λ is given by :
- (A) $P(x + 1) - \lambda P(x) = 0$
(B) $\lambda P(x + 1) - P(x) = 0$
(C) $(x + 1) P(x + 1) - \lambda P(x) = 0$
(D) $(x + 1)P(x) - xP(x + 1) = 0$
62. If $X \sim \text{Expo}(5)$, the probability density function of X is :
- (A) $5e^{-5X}$ for $X > 0$
(B) e^{-5X} for $X > 0$
(C) $\frac{1}{5}e^{-5X}$ for $X > 0$
(D) None of these
63. The mean of exponential distribution with parameter λ is given as :
- (A) $\frac{1}{\lambda}$
(B) λ
(C) λ^2
(D) $\frac{1}{\lambda^2}$
64. The probability density functions of a random variable X distributed as Gamma variate with parameter n is given as :
- (A) $\frac{1}{\Gamma(n)} X^{n-1} e^{-X}; n > 0, 0 < x < \infty$
(B) $\Gamma(n) X^{n-1} e^X; n > 0, 0 < x < \infty$
(C) $\frac{1}{\Gamma(n)} (1 - X)^{n-1} e^{-X}; n > 0, 0 < x < \infty$
(D) $\frac{1}{\Gamma(n)} e^{-\frac{1}{X}} X^{n-1}; n > 0, 0 < x < \infty$

65. The mean and variance for Gamma distribution with parameters a and λ are :
- (A) $E(X) = \frac{1}{\lambda}, Var(X) = \frac{a}{\lambda^2}$
- (B) $E(X) = \frac{a}{\lambda}, Var(X) = \frac{1}{\lambda^2}$
- (C) $E(X) = \frac{a}{\lambda}, Var(X) = \frac{a}{\lambda^2}$
- (D) $E(X) = a\lambda, Var(X) = a\lambda^2$
66. The probability density functions for Beta distribution of first kind with parameters $m, n > 0$ is :
- (A) $\frac{1}{B(m,n)} x^{m-1} (1+x)^{n-1}, 0 < x < 1$
- (B) $\frac{1}{B(n,m)} x^{m-1} (1-x)^{n+1}; 0 < x < 1$
- (C) $\frac{1}{B(m,n)} x^{m-1} x^n; 0 < x < 1$
- (D) $\frac{1}{B(m,n)} x^{m-1} (1-x)^{n-1}; 0 < x < 1$
67. The probability density function for Beta type II distribution with parameters $\alpha, \beta > 0$ is :
- (A) $\frac{x^{\alpha-1}}{(1+x)^{\alpha+\beta}}, x > 0$
- (B) $\frac{1}{B(\alpha,\beta)} \frac{x^{\beta-1}}{(1+x)^{\alpha+\beta}}, \text{ for } (0 \leq x \leq 1)$
- (C) $\frac{1}{B(\alpha,\beta)} \frac{x^{\alpha-1}}{(1+x)^{\alpha+\beta}}, \text{ for } 0 \leq x \leq \infty$
- (D) $\frac{1}{B(\alpha,\beta)} \frac{x^{\alpha-1}}{(1-x)^{\alpha+\beta}}, \text{ for } 0 < x < \infty$
68. The probability density function for Laplace variate $X \sim L(\mu, \lambda)$ is :
- (A) $\frac{1}{2} e^{-\lambda|X-\mu|}$
- (B) $\frac{1}{2} \mu e^{-\lambda|X-\mu|}$
- (C) $\frac{1}{2} \lambda e^{\lambda|X-\mu|}$
- (D) $\frac{1}{2} \lambda e^{-\lambda|X-\mu|}$

69. The Laplace distribution is also known as :
- (A) Exponential
 - (B) Double exponential
 - (C) Double gamma
 - (D) None of the above
70. A continuous random variable X is said to have a Pareto's distribution if its probability density function is given by :
- (A) $\theta A^\theta \cdot \frac{1}{x^{\theta+1}}$, for $x \geq A$
 - (B) $\theta A^{\theta-1} \cdot \frac{1}{x^{\theta+1}}$, for $x < A$
 - (C) $\theta A^\theta \cdot \frac{1}{x^\theta}$, for $x \geq A$
 - (D) None of the above
71. The Pareto distribution depends on :
- (A) 1 parameter
 - (B) 2 parameters
 - (C) 3 parameters
 - (D) None of the above
72. A random variable X has a Weibul distribution with parameters $K > 0, \alpha > 0$ and μ if its probability density functions is :
- (A) $\frac{K}{\alpha} \left(\frac{x-\mu}{\alpha}\right)^K \exp[-(x-\mu)^K]_i x > \mu, K > 0$
 - (B) $\frac{K}{\alpha} \left(\frac{x-\mu}{\alpha}\right)^{K-1} \exp\left[-\left(\frac{x-\mu}{\alpha}\right)^K\right]_i x > \mu, K > 0$
 - (C) $\frac{K^2}{\alpha^2} \left(\frac{x-\mu}{\alpha}\right)^K \exp\left[-\left(\frac{x-\mu}{\alpha}\right)^K\right]_i x > \mu, K > 0$
 - (D) $K \left(\frac{x-\mu}{\alpha}\right)^K \exp\left[-\left(\frac{x-\mu}{\alpha}\right)^K\right]_i x > \mu, K > 0$

73. If $X \sim C(-2, 3)$, the probability density function of the variate X is :

(A) $\frac{1}{3\pi\left[1-\left(\frac{X+2}{3}\right)^2\right]}$, for $-\infty < X \leq \infty$

(B) $\frac{1}{\pi\left[1+\left(\frac{X+2}{3}\right)^2\right]}$, for $-\infty < X < \infty$

(C) $\frac{1}{3\pi\left[1+\left(\frac{X+2}{3}\right)^2\right]}$, for $-\infty < X < \infty$

(D) All the above

74. If X is a random variable the probability density function of the variable $\log_e X \sim N(\mu, \sigma^2)$ is :

(A) $\frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2\sigma^2}(\log_e X - \mu)^2}$

(B) $\frac{1}{X\sqrt{2\pi}} e^{-\frac{1}{2\sigma^2}(\log_e X - \mu)^2}$

(C) $\frac{1}{\sigma X\sqrt{2\pi}} e^{-\frac{1}{2\sigma^2}(\log_e X - \mu)^2}$

(D) Any of the above

75. The shape of the normal curve is :

(A) Bell shaped

(B) Flat

(C) Circular

(D) Spiked

76. The range of normal distribution is :

(A) 0 to n

(B) 0 to ∞

(C) -1 to 1

(D) $-\infty$ to ∞

77. The shape of the normal depends upon the value of :
- (A) Standard deviation
 - (B) Q_1 [Frist Quartile]
 - (C) Mean deviation
 - (D) Quartile deviation
78. The normal curve is asymptotic to the :
- (A) Y – axis
 - (B) X – axis
 - (C) Along $Y = X$
 - (D) None of the above
79. If $Y = 5X + 10$ and $X \sim N(10, 25)$ then mean of Y is :
- (A) 135
 - (B) 50
 - (C) 70
 - (D) 60
80. If $X \sim N(\mu, \sigma^2)$, the points of inflexion of normal distribution curve are :
- (A) $\pm\mu$
 - (B) $\mu \pm \sigma$
 - (C) $\sigma \pm \mu$
 - (D) $\pm\sigma$
81. If $X \sim N(8, 64)$, then the standard normal variate Z will be :
- (A) $Z = \frac{X-64}{8}$
 - (B) $Z = \frac{X-8}{64}$
 - (C) $Z = \frac{X-8}{8}$
 - (D) $Z = \frac{8-X}{8}$

82. The M.G.F. of the normal distribution of a normal variate $X \sim N(\mu, \sigma^2)$ is :
- (A) $e^{\mu t - \frac{1}{2}t^2\sigma^2}$
 - (B) $e^{\mu t + \frac{1}{2}t^2\sigma^2}$
 - (C) $e^{-\mu t + \frac{1}{2}t^2\sigma^2}$
 - (D) $e^{-\mu t - \frac{1}{2}t^2\sigma^2}$
83. Normal distribution was invented by :
- (A) Laplace
 - (B) De-Moivre
 - (C) Gauss
 - (D) All the above
84. Let $X \sim N(\mu, \sigma^2)$ then the central moments of odd order are :
- (A) One
 - (B) Zero
 - (C) Infinite
 - (D) Positive
85. For a standard normal variate, the mean and variance are :
- (A) Mean = 1, Variance = 0
 - (B) Mean = 0, Variance = 0
 - (C) Mean = 0, Variance = 1
 - (D) Mean = 1, Variance = 1
86. Ordered statistics is a sequence of :
- (A) Observations
 - (B) Ranks
 - (C) Natural numbers
 - (D) Integers

87. Let $X_{(1)} = \text{Min}(X_1, X_2, \dots, X_n)$
 $X_{(n)} = \text{Max}(X_1, X_2, \dots, X_n)$
and $X_{(1)} < X_{(2)} < \dots < X_{(n)}$
Then the sample midrange defined as :
- (A) $\frac{X_{(1)}+X_{(n)}}{2}$
(B) $\frac{X_{(1)}-X_{(n)}}{2}$
(C) $X_{(1)} + X_{(n)}$
(D) $X_{(n)} - X_{(1)}$
88. Let $X_{(1)} < X_{(2)} < \dots < X_{(n)}$ be the order statistics and $F_X(x)$ be its distribution function then the *p. d. f.* of order statistics is given as:
- (A) $f_{X_{(r)}}(x) = \frac{n!}{r!(n-r)!} f_X(x) [F_X(x)]^{r-1}$
(B) $f_{X_{(r)}}(x) = \frac{n!}{(r-1)!(n-r)!} f_X(x) [F_X(x)]^{r-1} [1 - F_X(x)]^{n-r}$
(C) $f_{X_{(r)}}(x) = f_X(x) [F_X(x)]^{r-1} [1 - F_X(x)]^{n-r}$
(D) None of the above
89. For X_1, X_2, \dots, X_n iid continuous random variables with *pdf* $f(x)$ and distribution function $F(x)$, then the density of the minimum of X_i 's ($X_{(1)}$) is :
- (A) $n f(x) [1 - F(x)]^{n-1}$
(B) $f(x) [1 - F(x)]^n$
(C) $(n - 1) f(x) [1 - F(x)]^n$
(D) All the above
90. For X_1, X_2, \dots, X_n iid continuous random variables with *pdf* $f(x)$ and distribution function $F(x)$, then the density of the maximum of X_i 's ($X_{(n)}$) is :
- (A) $n f(x) [F(x)]^{n-1}$
(B) $(n - 1) f(x) [F(x)]^{n-1}$
(C) $f(x) [F(x)]^{n-1}$
(D) None of the above

91. Let X_1, X_2, \dots, X_n be independent identically distributed random variables with $U(0, 1)$ then the density of $X_{(K)}$ is given by :
- (A) $n \binom{n}{K} x^{K-1} (1-x)^{n-K}, 0 < x < 1$
- (B) $(n-1) \binom{n}{K} x^{K-1} (1-x)^{n-K}, 0 < x < 1$
- (C) $n \binom{n}{K} x^{K-1} (1-x)^{n-K}, 0 < x < \infty$
- (D) $n \binom{n-1}{K-1} x^{K-1} (1-x)^{n-K}, 0 < x < 1$
92. The abbreviation *iid* stands for ;
- (A) Identically and independently distributed
- (B) Independent and identically distributed
- (C) Both (A) and (B)
- (D) None of (A) and (B)
93. For an exponential distribution with probability density function, $f(x) = \frac{1}{2} e^{-x/2}; x \geq 0$ its mean is :
- (A) $\frac{1}{2}$
- (B) 2
- (C) $\frac{1}{3}$
- (D) 3
94. The mean of Beta distribution of first kind with parameters m and n is :
- (A) $\frac{m}{mn}$
- (B) $\frac{m}{m+n}$
- (C) $\frac{m}{m-n}$
- (D) $\frac{m+n}{mn}$
95. The mean of a normal distribution is 50, its mode will be :
- (A) 25
- (B) 40
- (C) 50
- (D) None of the above

96. For Poisson distribution :
- (A) Mean = Variance
 - (B) Mean = Standard deviation
 - (C) Mean > Variance
 - (D) Mean < Variance
97. A discrete random variable has $pmf: p(x) = Kq^x p$; $p + q = 1, x = 2, 3, 4, \dots$ the value K should be equal to :
- (A) $\frac{1}{q^2}$
 - (B) $\frac{1}{p}$
 - (C) $\frac{1}{q}$
 - (D) $\frac{1}{pq}$
98. If $X_1 \sim b(n_1, p_1)$ and $X_2 \sim b(n_2, p_2)$ then the sum of the variates $(X_1 + X_2)$ is distributed as :
- (A) Hypergeometric distribution
 - (B) Binomial distribution
 - (C) Poisson distribution
 - (D) None of the above
99. Binomial distribution $b(n, p)$ tends to Poisson distribution when :
- (A) $n \rightarrow \infty, p \rightarrow 0$ and $np = \mu$ (finite)
 - (B) $n \rightarrow \infty, p \rightarrow \frac{1}{2}$ and $np \rightarrow \mu$ (finite)
 - (C) $n \rightarrow 0, p \rightarrow 0, np \rightarrow 0$
 - (D) $n \rightarrow 20, p \rightarrow 0, np \rightarrow 0$
100. A normal random variable has mean = 2 and variance = 4. Its fourth central moment μ_4 will be :
- (A) 16
 - (B) 64
 - (C) 80
 - (D) 48

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