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Paper Code		
2	5	6

(To be filled in the OMR Sheet)

O.M.R. Serial No.

प्रश्नपुस्तिका क्रमांक
Question Booklet No.

प्रश्नपुस्तिका सीरीज
Question Booklet Series
C

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

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, जिनमे से केवल 75 प्रश्नों के उत्तर परीक्षार्थियों द्वारा दिये जाने है। 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 जॉच कर देख लें कि प्रश्नपुस्तिका के सभी पृष्ठ भलीभॉति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्ष निरीक्षक को दिखाकर उसी सीरीज की दूसरी प्रश्नपुस्तिका प्राप्त कर लें।**

K-256

Rough Work / रफ कार्य

1. A normal random variable has mean =2 and variance = 4. Its fourth central moment $\mu_4$will be :

(A) 16

(B) 64

(C) 80

(D) 48

2. Binomial distribution $b(n,p)$ tends to Poisson distribution when :

(A) $n \to \infty,\ p \to 0$ and $np = \mu$ (finite)

(B) $n \to \infty, p \to \frac{1}{2}$and $np \to \mu$ (finite)

(C) $n \to 0, p \to 0, np \to 0$

(D) $n \to 20, p \to 0, np \to 0$

3. 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

4. A discrete random variable has pmf:$p(x) = Kq^x p;\ p + q = 1, x = 2, 3, 4 \ldots\ldots$the value K should be equal to :

(A) $\frac{1}{q^2}$

(B) $\frac{1}{p}$

(C) $\frac{1}{q}$

(D) $\frac{1}{pq}$

5. For Poisson distribution :

(A) Mean = Variance

(B) Mean = Standard deviation

(C) Mean > Variance

(D) Mean < Variance

6. The mean of a normal distribution is 50, its mode will be :

(A) 25

(B) 40

(C) 50

(D) None of the above

7. 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) $\frac{m+n}{mn}$

8. 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

9. 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)

10. 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) $n\binom{n-1}{K-1}x^{K-1}(1-x)^{n-K}, 0 < x < 1$

11. 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

12. 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

13. Let $X_{(1)} < X_{(2)} <\dots\dots< X_{(n)}$ 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

14. Let $X_{(1)} = Min(X_1, X_2, \dots\dots, X_n)$

$X_{(n)} = Max(X_1, X_2, \dots\dots, X_n)$

and $X_{(1)} < X_{(2)} <\dots\dots\dots\dots< X_{(n)}$

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) $X_{(n)} - X_{(1)}$

15. Ordered statistics is a sequence of :

(A) Observations

(B) Ranks

(C) Natural numbers

(D) Integers

16. 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

17. Let $X \sim N(\mu, \sigma^2)$ then the central moments of odd order are :

(A) One

(B) Zero

(C) Infinite

(D) Positive

18. Normal distribution was invented by :

(A) Laplace

(B) De-Moivre

(C) Gauss

(D) All the above

19. 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) $e^{-\mu t - \frac{1}{2} t^2 \sigma^2}$

20. 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) $Z = \frac{8-X}{8}$

21. 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) $\pm\sigma$

22. If $Y = 5X + 10$ and $X \sim N(10, 25)$ then mean of Y is :

(A) 135

(B) 50

(C) 70

(D) 60

23. The normal curve is asymptotic to the :

(A) Y − axis

(B) X − axis

(C) Along Y = X

(D) None of the above

24. The shape of the normal depends upon the value of :

(A) Standard deviation

(B) Q_1[Frist Quartile]

(C) Mean deviation

(D) Quartile deviation

25. The range of normal distribution is :

(A) 0 to n

(B) 0 to ∞

(C) -1 to 1

(D) $-\infty$ to ∞

26. The shape of the normal curve is :

(A) Bell shaped

(B) Flat

(C) Circular

(D) Spiked

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

(D) Any of the above

28. 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

29. 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) $K\left(\frac{x-\mu}{\alpha}\right)^{K} \exp\left[-\left(\frac{x-\mu}{\alpha}\right)^{K}\right]_{i}\ x > \mu, K > 0$

30. The Pareto distribution depends on :

(A) 1 parameter

(B) 2 parameters

(C) 3 parameters

(D) None of the above

31. A continuous random variable X is said to have a Pareto's distribution if tis 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

32. The Laplace distribution is also known as :

(A) Exponential

(B) Double exponential

(C) Double gamma

(D) None of the above

33. 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) $\frac{1}{2} \lambda e^{-\lambda|X-\mu|}$

34. 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) $\frac{1}{B(\alpha,\beta)} \frac{x^{\beta-1}}{(1+x)^{\alpha+\beta}}$, for $(0 \leq x \leq 1)$

(C) $\frac{1}{B(\alpha,\beta)} \frac{x^{\alpha-1}}{(1+x)^{\alpha+\beta}}$, for $0 \leq x \leq \propto$

(D) $\frac{1}{B(\alpha,\beta)} \frac{x^{\alpha-1}}{(1-x)^{\alpha+\beta}}$, for $0 < x < \propto$

35. 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) $\frac{1}{B(m,n)} x^{m-1}(1-x)^{n-1};\ 0 < x < 1$

36. The mean and variance for Gamma distribution with paramers 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) $E(X) = a\lambda, Var(X) = a\lambda^2$

37. The probability density functions of a random variable X distributed as Gamma variate with parameter n is given as :

(A) $\frac{1}{\Gamma n} X^{n-1} e^{-X}; \; n > 0, 0 < x < \propto$

(B) $\Gamma n \, X^{n-1} e^{X}; \; n > 0, \; 0 < x < \propto$

(C) $\frac{1}{\Gamma n} (1 - X)^{n-1} e^{-X}; \; n > 0, 0 < x < \propto$

(D) $\frac{1}{\Gamma n} e^{-\frac{1}{X}} X^{n-1}; \; n > 0, 0 < x < \propto$

38. The mean of exponential distribution with parameter λ is given as :

(A) $\frac{1}{\lambda}$

(B) λ

(C) λ^2

(D) $\frac{1}{\lambda^2}$

39. If $X \sim$ 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

40. 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) $(x + 1) P(x) - x P(x + 1) = 0$

41. For a poisson distribution $P(1) = P(2)$ then its variance is :

(A) 3

(B) 4

(C) 6

(D) 2

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

(A) 6

(B) 1.5

(C) 3

(D) None of the above

43. 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

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

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

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

45. 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) $\binom{n}{X} p^X q^{n-X}$

46. The moment generating function of Bernoulli distribution is :

(A) $(q + pe^t)^n$

(B) $(q + pe^t)^{-n}$

(C) $(q + pe^t)$

(D) $(q + pe^{-t})$

47. 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

48. In case of binomial distribution we see that :

(A) $mean > variance$

(B) $mean < variance$

(C) $mean = variance$

(D) None of the above

49. The mean of binomial distribution is :

(A) p

(B) np

(C) npq

(D) p^2

50. 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

51. 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

52. The straight line $Y = a + bX$ is fitted by the method of least squares from the data given below -

X = 1 2 3

Y = 3 6 9

The value of b is :

(A) 0

(B) 1

(C) 2

(D) 3

53. 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

54. Correlation coefficient was invented in the year :

(A) 1910

(B) 1890

(C) 1908

(D) None of the above

55. 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

56. For a 3×3 contingency table, the degrees of freedom is :

(A) 9

(B) 4

(C) 3

(D) 6

57. 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

58. 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

59. Coefficient of contingency is a measure of :

(A) Independence of attributes

(B) Dependence of attributes

(C) Correlation

(D) All of the above

60. 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

61. If there is perfect positive association between the two attributes Q would be :

(A) -1

(B) +0.99

(C) +1

(D) 0

62. 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) $(AB) \leq \frac{(A)\times(B)}{N}$

63. 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)

64. With two attributes one can have in all :

(A) Two class frequencies

(B) Four class frequencies

(C) Eight class frequencies

(D) Nine class frequencies

65. 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

66. 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

67. Measures of association usually deal with :

(A) Attributes

(B) Quantitative factors

(C) Variables

(D) Numbers

68. 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) $\frac{1}{3}n(n^2 - 1)$

69. 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) $1+\frac{6\sum d_i}{n(n^2-1)}$

70. Maximum value of rank correlation coefficient is :

(A) 0

(B) +1

(C) -1

(D) None of the above

71. Rank correlation is superior method of analysis in case of________ distribution.

(A) Qualitative

(B) Quantitative

(C) Frequency

(D) None of the above

72. Rank correlation was found by

(A) Galton

(B) Spearman

(C) Fisher

(D) Pearson

73. 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

74. 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°

75. 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

76. 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

77. The lines of regression intersect at the point :

(A) (X, Y)

(B) $(\bar{X}, \bar{Y})$

(C) $(0, 0)$

(D) $(1, 1)$

78. If $\beta_{YX} > 1$, then β_{XY} is :

(A) Less than 1

(B) Greater than 1

(C) Equal to 1

(D) Equal to 0

79. 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

80. In the regression line $Y = \beta_0 + \beta_1 X, \beta_0$ is the :

(A) Slope of the line

(B) Intercept of the line

(C) Both (A) and (B)

(D) Neither (A) nor (B)

81. 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

82. 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

83. Which of the following indicates a strong negative correlation ?

(A) $r = -0.793$

(B) $r = -0.846$

(C) $r = 0.913$

(D) $r = 0.45$

84. 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) $r = -1.0$

85. 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)

86. The range of the correlation coefficient is :

(A) $(-1, 1)$

(B) $[-1, 1]$

(C) $(0, 1)$

(D) None of the above

87. 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)

88. 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

89. 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

90. Regression equation is also named is :

(A) Prediction equation

(B) Estimating equation

(C) Line of average relationship

(D) All of the above

91. 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

92. The term regression was introduced by :

(A) R.A. Fisher

(B) Karl Pearson

(C) Sir Francis Galton

(D) None of the above

93. 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

94. 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

95. 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

96. $y = ab^x$ is a :

(A) Exponential curve

(B) Logistic curve

(C) Gomphertz curve

(D) None of the above

97. Given $(x_1, y_1), (x_2, y_2), \ldots\ldots\ldots, (x_n, y_n)$, 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) $\sum_{i=1}^{n} [y_i - \bar{y}]^2,\ \bar{y} = \frac{\sum_{i=1}^{n} y_i}{n}$

98. 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

99. 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

100. In a method of least squares, the sum of squares of residuals are :

(A) Maximised

(B) Minimised

(C) Zero

(D) None of the above

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