							Code No.	R -	2119
En	Entrance Examination for Admission to the P.G. Courses in the Teaching Departments, 2023								
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ę	STATISTICS,	APPLI	ED ST	ATISTIC	CS AND	D DAT		YTICS	
			<u>Gener</u>	al Instru	<u>ctions</u>				
1. The	Question Pape	r is havin	ig 100 O	bjective	Questior	ns, each	carrying	one ma	rk.
2. The	answers are to	be (✔) 't	ick mark	ed' only	in the " F	Respon	se Sheet"	provide	ed.
3. <u>Neg</u>	ative marking	: 0.25 m a	arks will	be dedu	cted for	each wr	ong answ	er.	
Time : 2 I	Hours						Ma	ax. Mai	rks : 100
To be fill	ed in by the Ca	ndidate							
Register	in Figures								
Number	in words								

Choose appropriate answer from the options in the questions.

(100 × 1 = 100 marks)

- 1. If X and Y are two independent Poisson variates with parameters 3 and 4 respectively. What is the value of P(Y = 3 | X + Y = 8)?
 - a) 0.051 b) 0.037
 - c) 0.151 d) 0.245

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- 2. Which of the following is an example of ordinal variable?
 - a) Caste
 - b) Nationality
 - c) Annual income
 - d) Credit rating of a bank

- 3. The equations 2x + 5 = 5, x + 3y = 5, x 2y = 0 have _____ number of solutions.
 - a) zero b) one
 - c) two d) many
- 4. If F(x) is the distribution function of the random variable X, then for $a \le b$
 - a) P(a < X < b) = F(b) F(b)
 - b) P(a < X < b) = F(b) F(a) P(X = a)
 - c) P(a < X < b) = F(b) F(a) P(X = b)
 - d) P(a < X < b) = F(b) F(a) P(X = a) P(X = b)
- 5. Consider the following statements
 - I. If S is closed and δ is admissible, then every risk function is convex
 - II. If S is closed, then S will not have a limit point
 - III. If S is closed from below, then $S \notin E_k$

Which of the following is correct?

- a) Only I is correct b) Only II is correct
- c) Both I and II is correct d) Both II and III is correct

- 6. In the analysis of RBD with *b* blocks and *v* treatments, the error degrees of freedom are
 - a) b(v-1) b) v(b-1)
 - c) (b-1)(v-1) d) (b-v)
- 7. Consider the following statements :
 - I. A complete class of decision rules contains only admissible decision rules
 - II. A minimal complete class of decision rule contains only admissible decision rules
 - III. A minimal complete class of decision rule is always complete

Which of the following is correct?

- a) Only I is correct b) Only II is correct
- c) Both I and II is correct d) Both II and III is correct
- 8. Consider a lot consisting of 10 bulbs is inspected by taking at random 3 bulbs and testing them for defective or non-defective. If the number of defective bulbs in the lot is 4, what is Pr (2 defective bulbs)?
 - a) 0.2 b) 0.3
 - c) 0.4 d) 0.5
- 9. Variance of Hypergeometric distribution with N = 20, n = 5 and M = 12 is given by
 - a) 0.947 b) 1.245
 - c) 3.276 d) 4.563

- 10. Let $\{X_n, Y_n\}$, n = 1, 2, ..., be a sequence of random variables. Then $|X_n Y_n| \xrightarrow{p} 0$ and $Y_n \xrightarrow{L} Y$ implies
 - a) $X_n \xrightarrow{L} X$ b) $X_n \xrightarrow{L} Y$
 - c) $Y_n \xrightarrow{L} X$ d) $X_n Y_n \xrightarrow{L} Y$
- 11. The UCL and LCL of a basic mean chart is given as 12 and 8 respectively. If variance of the process is given as 16, then what is the sample size of the process?
 - a) 36 b) 28
 - c) 25 d) 18
- 12. If $X \sim \text{Poisson}$ (4) and $Y \sim \text{Poisson}$ (3), and X and Y are independent. What is the value of E[X | (X + Y)], if n = 10?
 - a) 3.45 b) 4.32
 - c) 5.23 d) 5.71
- 13. The value of *m* so that the vector (m, 3, 1) is a linear combination of the vectors (3, 2, 1) and (2,1, 0) is
 - a) 1 b) 3
 - c) 5 d) 7

- 14. Given the following statements about a one parameter exponential family of distribution
 - I. It always admits sufficient statistics
 - II. The moment estimator $\hat{\theta}$ based on sufficient statistics is CAN for θ
 - III. The asymptotic variance zero every time

Which of the following are correct?

- a) Only I and II are correct b) Only I and III are correct
- c) Only II and III are correct d) All are correct
- 15. If the mean value function of a renewal process is m(t) = 2t, $t \ge 0$, what is the value of M(T)?
 - a) 2 b) *t*
 - c) t^2 d) $2t^2$
- 16. The following statements given is respect of Maximum Likelihood Estimation (MLE)
 - I. MLE's are always unique
 - II. MLE's are not necessarily unbiased
 - III. MLE's satisfies invariance property, provided the transformation is one-toone

Which of the following are correct?

- a) Only I and II correct b) Only I and III are correct
- c) Only II and III are correct d) All are correct

- 17. Consider the following statements
 - I. Least square estimators are unbiased for all general linear models
 - II. Under fairly general conditions, the estimates obtained by method of moments will have asymptotically normal distribution for large *n*
 - III. The minimum chi-square estimators are not necessarily consistent Which of the following are correct?
 - a) Only I and II are correct b) Only I and III are correct
 - c) Only II and III are correct d) All are correct
- 18. The matrix $\begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix}$ isa) Positive definiteb) Negative definitec) Positive semi definited) Negative semi definite
- 19. Let N(t) be a Poisson process with constant intensity function on *R*. What is the covariance of N(s) and N(t)?
 - a) λs , if s < t b) $\lambda(t-s)$, if s < t
 - c) $\lambda(s-t)$, if (t < s) d) $\lambda(s+t)$
- 20. A bag contains 5 black, 6 red and 3 white balls. If a ball is drawn at random, what is the probability that it is not a white ball?
 - a) 11/14 b) 13/14
 - c) 38/55 d) 27/35

- 21. Every sequence $\{X_n\}$ of independent random variables with uniformly bounded variances obeys
 - a) Borel-Cantelli lemma b) Cauchy's criterion
 - c) WLLN d) SLLN
- 22. If V be a collection of vectors, then V is said to be subspace, if
 - a) V is closed under multiplication
 - b) V is closed under multiplication and addition
 - c) *V* is closed under scalar multiplication
 - d) V is closed under addition and scalar multiplication
- 23. Let X be a random variable with pgf P(S). Then the pgf of 3X 1 is
 - a) SP(S) b) S/P(S)c) P(S)/S d) $P(S^3)/S$
- 24. The AQL of a process is the
 - a) Lowest fraction defective that is acceptable to the customer
 - b) Lowest fraction defective that is unacceptable to the customer
 - c) Highest fraction defective that is unacceptable to the customer
 - d) Highest fraction defective that is acceptable to the customer
- 25. With the usual notations, find *p* for a binomial random variable *X*, if *n* = 6 and if 9P(X = 1) = P(X = 2)
 - a) 12/15 b) 18/23
 - c) 19/27 d) 9/14

- 26. The quadratic form $6x_1^2 + 3x_2^2 + 14x_3^2 + 4x_2x_3 + 18x_1x_3 + 4x_1x_2$ is
 - a) Negative definite b) Positive definite
 - c) Positive semi definite d) Negative semi definite
- 27. Let *T* be CAN for θ so that $T \sim AN(\theta, \sigma_{\tau}^2(\theta)/a_n^2)$ and let ψ be a differentiable function such that $\frac{d\psi}{d\theta}$ is continuous and non vanishing then $\psi(T)$ is CAN for $\psi(\theta)$ with asymptotic variance.
 - a) $\left(\frac{d\psi}{d\theta}\right)^2 \sigma_T^2(\theta)$ b) $\left(\frac{d\psi}{d\theta}\right)^2 a_n^2 \sigma_T^2(\theta)$

c)
$$\left(\frac{d\psi}{d\theta}\right)^2 \frac{\sigma_T^2(\theta)}{a_n^2}$$
 d) $\left(\frac{d\psi}{d\theta}\right)^2 \frac{\sigma_T^4(\theta)}{a_n^4}$

- 28. If the percent of trend for a year in a time series is greater than 100%, it indicates that
 - a) The actual time series value lies below the trend line and the relative cyclical residual is positive
 - b) The actual time series value lies below the trend line and the relative cyclical residual is negative
 - c) The actual time series value lies above the trend line and the relative cyclical residual is negative
 - d) The actual time series value lies above the trend line and the relative cyclical residual is positive

- 29. If 3, 8, 5, 4 and 10 are exponential samples with mean θ . The Fisher information function evaluated at $\theta = 2$ is
 - a) 0.50 b) 0.80
 - c) 1.20 d) 1.25
- 30. The ratio of number of replication required in CRD and RBD for the same amount of information is
 - a) 3:2 b) 5:3 d) 3:5
- 31. The number of monthly breakdowns of computers is a random variable having a Poisson distribution with a mean equal to 1.8. Find the probability that this computer will function for a Month without a breakdown.
 - a) 0.165 b) 0.265 c) 0.365 d) 0.465

32. If
$$A = \begin{bmatrix} 3 & -7 \\ -4 & 1 \end{bmatrix}$$
, then the determinant of $A^3 + 3A^2 + 12A$ is
a) -2900 b) -29500
c) -3000 d) -39500

- 33. The Cramer-Rao lower bound for $\psi(\theta) = e^{-\theta}$ in Poisson distribution with parameter θ is
 - a) $\frac{\theta}{n}e^{-2\theta}$ b) $\frac{n}{\theta}e^{-2\theta}$
 - c) $\frac{2\theta}{n}e^{-2\theta}$ d) $\frac{\theta^2}{n}e^{-2\theta}$

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34. Let $X_1, X_2, ..., X_n$ be iid Poisson (μ). Then the UMVUE of P(X = 0) is

a)
$$\left(1-\frac{1}{\overline{x}}\right)^n$$

b) $\left(1-\frac{n}{\overline{x}}\right)^n$
c) $\left(1-\frac{1}{n}\right)^{\Sigma x}$
d) $\left(1-\frac{1}{n}\right)^{\overline{x}}$

- 35. If 3, 8, 5, 4 and 10 are exponential samples with mean θ . Then the score function evaluated at $\theta = 4$ is
 - a) 0.36 b) 0.40
 - c) 0.56 d) 0.68
- 36. Consider the following statements :
 - I. For an estimator to be consistent, the unbiasedness of the estimator is necessary
 - II. If the variance of an estimator attains the Crammer-Rao lower bound, the estimator is consistent
 - III. A UMVUE is unique, if it exists

Which of the following are correct?

- a) Only I is correct b) Only II is correct
- c) Only III is correct d) None is correct
- 37. If 12, 18, 8, 22 and 15 are random samples from $N(\mu, \sigma^2)$. An unbiased estimator of σ^2 is given by
 - a) 20 b) 25
 - c) 29 d) 33

- 38. Basu's theorem is useful in determining the statistics V which is
 - a) Independent of sufficient statistic T
 - b) Linear function of U and T
 - c) Monotone in U for fixed t
 - d) None of these
- 39. The nonparametric test equivalent of a one-way ANOVA is
 - a) Wilcoxon Signed Rank Test b) Wilcoson Rank Sum Test
 - c) Kruskall-Wallis Test d) Ansari-Bradley Test
- 40. The summary of two variables are given as follows

 $\sum X_i = 53$, $\sum x_i^2 = 297$, $\sum y_i = 277.5$, $\sum y_i^2 = 9941.25$, $\sum x_i y_i = 1630$ and n = 12

What is the value of slope?

- a) 2.5 b) 3.6
- c) 4.8 d) 6.4

41. If n = 15, $\sum x = 480$, $\sum x^2$, then the standard deviation of y = 5x - 10 is

- a) 100 b) 96.82
- c) 47.56 d) 112.88

- 42. Let $X_1, X_2,...$ be iid Poisson (λ) random variables. If $S_n = \sum_{k=1}^n X_k$. If $\lambda = 1$ and n = 64, then the value of $P\{50 < S_n < 80\}$ is approximately
 - a) 0.7329 b) 0.8321
 - c) 0.7884 d) 0.9348

43. Consider a discrete classification with n_1 , n_2 , n_3 , n_4 as the number of observations in each cell such that $\sum_{i=1}^{3} n_i = n$. The cell probabilities are respectively given as θ^2 , $\theta[1-\theta]$, $\theta(1-\theta)$ and $(1-\theta)^2$. What is the MLE of θ is

a)
$$\frac{n_4}{2n}$$
 b) $\frac{2n_1 + n_2}{n_1 + n_3}$

c)
$$\frac{2n_1 + n_3}{n_1 + n_2 + n_4}$$
 d) $\frac{2n_1 + n_2 + n_3}{2n}$

44. Let X be a random variable having the probability function

$$f(x, \theta) = {n \choose x} \theta^{x} (1-\theta)^{n-x}, x = 0, 1, 2, ..., n$$

If $d(x) = \frac{x}{n}$, then the risk function $R(\theta, d)$ under squared error loss function is

a)
$$\frac{\theta(\theta-1)}{n}$$
 b) $\frac{\theta(\theta+1)}{n}$

c)
$$\frac{\theta(1-\theta)}{n}$$
 d) $\frac{\theta^2}{n}$

45. Let X_1, X_2, \dots be iid Bernoulli with parameter (λ) . If apriori it is known that $\lambda \in [1/4, 3/4]$. If $\overline{X} \ge \frac{3}{4}$. What is the MLE of λ ?

46. An inspection of 10 samples of size 400 each from 10 lots revealed the following defective units 17, 15, 14, 26, 9, 4, 19, 12, 9, 15. The upper control limit for number of defective is

a)	18.95	b)	21.45
c)	23.32	d)	25.03

- 47. The measure of Kurtosis of *t*-distribution is
 - a) $\frac{n-2}{n-3}$ b) $\frac{3(n-2)}{n-4}$

c)
$$\frac{3(n-2)}{n+4}$$
 d) $\frac{n+2}{n+4}$

48. If
$$A = \begin{bmatrix} 2 & -2 & -4 \\ -1 & 3 & 4 \\ 1 & -2 & x \end{bmatrix}$$
 is an idempotent matrix, then the value of x is
a) -1 b) -3

c) -5 d) 3

- 49. Let $X_1, X_2, ..., X_n$ be iid with $f(x) = \theta x^{\theta-1}, 0 < x < 1, \theta > 0$. Then the Cramer–Rao Lower Bound for estimating θ is
 - a) $n\theta$ b) $\frac{\theta}{n}$

c)
$$\frac{\theta^2}{n}$$
 d) $\frac{\theta^2}{n^2}$

50. If a fair coin is tossed two times and the characteristics of interest X is the number of heads. What is the value of value of E(2X-3)?

- 51. Degrees of freedom for Chi-square in case of contingency table of order (4 \times 3) are
 - a) 12 b) 9
 - c) 8 d) 6
- 52. A small sample has been taken from a normally distributed population and the sample mean has been found to be 62. The upper limit of a 95 percent confidence interval for population mean is 81.60. The population variance is known to be 2,400. What is the sample size?
 - a) 24 b) 30
 - c) 36 d) 64

53. Consider the following results on a correlation study :

Regression equations : 6y = 5x + 90 and 15x = 8y + 130 and variance of X = 4. What is the coefficient of correlation between X and Y?

a)	0.45	b)	0.67
a)	0.45	U)	0

- c) 0.78 d) 0.88
- 54. A magazine claims that 25% of its readers are college students. Of a random sample of 200 readers, 42 are college students. It is to be tested at a 0.10 level of significance whether the proportion of college students among all the readers of the magazine is not equal to 0.25. What is the conclusion?
 - a) The proportion of college students among the readers of the magazine is 0.25
 - b) The sample data are incorrect
 - c) The proportion of college students among the readers of the magazine is less than 0.25
 - d) The proportion of college students among the readers of the magazine is more than 0.25
- 55. The variance of Hyper geometric distribution with N = 20, n = 5 and M = 12 is given by

a)) 1.34	b)	1.28
/		/	

- c) 1.02 d) 0.95
- 56. A random sample of 100 articles are taken from a batch of 2000 articles shows that the average diameter of the articles is 0.354 and standard deviation 0.048. What is the 95% confidence interval for the average diameter of a batch?
 - a) (0.2934, 0.4235) b) (0.3448, 0.3632)
 - c) (0.3021, 0.3824) d) (0.3923, 0.4212)

57. A multiple regression relationship contains two independent variables. The standard error of estimate is 4.8 and error sum of squares is 576. What is the sample size?

- c) 26 d) 28
- 58. Given the following joint density function :

$$f(x, y) = \lambda^2 e^{-\lambda y}, \ 0 \le x \le y < \infty$$

What is E(Y | X)?

- a) $X + 1/\lambda$ b) $x 1/\lambda$
- c) $2x + \lambda$ d) $2x \lambda$
- 59. Let *X* has the distribution function

$$F(x) = \begin{cases} 0, \ x < 0 \\ x/2, \ 0 \le X \le 2 \\ 1, \ x > 2 \end{cases}$$

Let $Y = X^2$, then what is the value of $P(X \le 2Y)$?

- a) 1/2 b) 2/3
- c) 3/4 d) 4/7
- 60. The percent of total variation of the dependent variable *Y* explained by the set of independent variable *X* is measured by
 - a) Coefficient of correlation b) Coefficient of skewness
 - c) Coefficient of determination d) Standard error

- 61. While conducting a one way ANOVA, comparing five treatments with ten observations per treatment, let SST = 42.41 and MSE = 6.34. What is the value of F?
 - a) 42.41 b) 6.34
 - c) 1.67 d) 0.74
- 62. The algebraic expression for interaction ABC is 2³ experiment is
 - a) $\frac{1}{4}(a-1)(b+1)(c+1)$ b) $\frac{1}{4}(a-1)(b-1)(c+1)$ c) $\frac{1}{4}(a-1)(b-1)(c-1)$ d) None of the above
- 63. Relative efficiency of LSD over RBD when rows are taken as blocks is

a)
$$\frac{S_R^2 + (t-1)S_E^2}{tS_E^2}$$

b)
$$\frac{S_C^2 + (t-1)S_E^2}{tS_E^2}$$

c)
$$\frac{S_C^2 + S_R^2(t-1)S_E^2}{tS_E^2}$$

d) None of the above

- 64. An experiment is replicated more than once
 - a) to remove experimental error
 - b) to remove the effect of natural factors creating experimental error
 - c) to find the estimate of experimental error
 - d) None of the above
- 65. Experimental error is due to
 - a) Experimenter's mistakes
 - b) Extraneous factors
 - c) Variation in treatment effects
 - d) None of the above

- 66. Which of the following is a contrast?
 - a) $3T_1 + T_2 3T_3 + T_4$ b) $T_1 + 3T_2 3T_3 + T_4$
 - c) $-3T_1 T_2 + T_3 + 3T_4$ d) $T_1 + T_2 + T_3 T_4$
- 67. The formula for estimating one missing value in a RBD having b blocks and t treatments with usual notations.
 - a) $\frac{bT'+tB'-G'}{(b-1)(t-1)}$ b) $\frac{bB'+bT'-G'}{(b-1)(t-1)}$
 - c) $\frac{bB' + tT' G'}{(b-1)(t-1)}$ d) None of the above
- 68. While analyzing the data of a $k \times k$ Latin square, the error d.f. in analysis of variance is equal to.
 - a) (k-1)(k-2) b) k(k-1)(k-2)
 - c) $k^2 2$ d) $k^2 k 2$
- 69. If the responses for treatments in a factorial experiment with factors A and B each at two levels from three replications are (1)=18, (a)=17, (b)=25 and (ab)=30, the sum of squares for the interaction AB is equal to
 - a) 4 b) 3
 - c) 6 d) 7

- 70. The formula for estimating one missing value in a Latin square of order k with usual notations is
 - a) (R'+C'+T'-G')/(k-1)(k-2)
 - b) [k(R'+C'+T')-2G']/(k-1)(k-2)
 - c) $K(R'+C'+T'-2G')/(k^2-1)$
 - d) None of the above
- 71. Kalman Filter is a method of updating the best estimate of the 'signal' in a T.S.
 - a) When noise is absent
 - b) When noise is present
 - c) When random component is present
 - d) When cyclic component is present
- 72. Moving average is also a kind of 'Filtering' when the weights in the filter are chosen in such a way that their sum is
 - a) Zero b) Unity
 - c) Finite d) Convergent
- 73. In order to determine the order of an AR process for higher order the autocorrelation function may be
 - a) a mixture of sine and cosine curve
 - b) a mixture of exponential and sinusoidal curve
 - c) a mixture of damped exponential and sinusoidal curve
 - d) a mixture of damped exponential and sine curve

- 74. While constructing the 'cost of living index number using the aggregate expenditure method the weights to be assigned to various commodities are provided by the
 - a) Quantities consumed in the base year
 - b) Quantities consumed in the current year
 - c) Quantities consumed in the previous year
 - d) Quantities consumed in any year
- 75. The mean height of 10,000 children of age 6 years is 41.26" and the standard deviation is 2.24". Then the odds against the possibility that the mean of a random sample of 100 is greater than 41.7" is

a)	39:1	b)	1:39
c)	40:1	d)	1:40

76. Consider the following joint probability mass function and the statements

$\begin{array}{c} X \\ \downarrow \\ Y \longrightarrow \end{array}$	1	2	3
0	1/24	1/12	1/8
1	1/12	1/6	1/4
2	1/24	1/12	1/8

- I. The variables are *X* and *Y* are independent
- II. The marginal probability of *X* and *Y* are the same.

Which of the following are correct?

a) Only I is correct

- b) Only II is correct
- c) Both I and II are correct
- d) Neither I nor II is correct

- 77. Consider the following statements
 - If three coins are tossed together then the probability of getting at least three Ι. head is 3/8
 - The probability of drawing four aces from a pack of 52 cards is 1/52 П. Which of the following are correct?
 - Only I is correct a) b)
 - c) Both I and II are correct
- Only II is correct
- d) Neither I nor II is correct
- 78. The joint pmf of (X, Y) are given by

$\begin{array}{c c} X & \downarrow \\ Y & \longrightarrow \end{array}$	1	2	3
1	0.2	0.1	0.2
2	0.2	0.0	0.1
3	0.1	0.1	0.0

What is the value of correlation between X and Y?

- -0.11b) -0.23 a) c) -0.45 d) -0.66
- 79. The joint pmf of (X, Y) is given by

X	1	2	3
$ Y \longrightarrow$			
1	0.2	0.1	0.2
2	0.2	0.3	0.0

What is the value of P(X + Y = 4)?

- 0.3 a) b) 0.4
- c) 0.5 d) 0.6

80. The value of $\sum_{r=0}^{n} {\binom{n}{r}}^2$ is

a)	$\binom{2n}{r}$	b)	$\binom{2n}{n}$
c)	$\binom{n}{2r}$	d)	$\binom{n}{r}$

- 81. Which of the following is the appropriate measure of central tendency for knowing the average score obtained by 11 footballers in a goal shoot competition?
 - a) Arithmetic mean
 - b) Median
 - c) Mode
 - d) Harmonic mean
- 82. Suppose (X, Y) is a bivariate random variable where

$$Y = \begin{cases} 1, \text{ with probability } 1/8 \\ 2, \text{ with probability } 7/8 \end{cases}$$

and

$$X \mid Y = \begin{cases} 2Y, \text{ with probability } 3/4 \\ 3Y, \text{ with probability } 1/4 \end{cases}$$

What is the value of E(X | Y = 1)?

- a) 3/4 b) 5/7
- c) 8/3 d) 9/4

83. Given the following grouped frequency table, in which interval does the median fall?

	Class interval	Frequency
	0 – 9	2
	10 – 19	4
	20 – 29	10
	30 – 39	12
	40 – 49	8
0 – 9		b) 10–19
20 – 29		d) 30 – 39

84. Suppose a frequency distribution is skewed with median 75 and mode 80 which of the following is the possible value of mean.

a)	72.5	b)	80
c)	85	d)	88

- 85. Earthquake intensities are measured by a device called a seismograph which is designed to be most sensitive for earthquakes with intensities between 4.0 and 9.0 on the open ended Richter scale. Measurement of the 9 earthquakes gave the following readings : 4.5, L , 5.5, H, 8.7, 8.9, 6.0, H , 5.2. Here L indicates earthquake intensity is below 4 and H indicates that the earthquake intensity is above 9. The median earthquake intensity of the sample is
 - a) Cannot be computed as the data is not complete
 - b) 6

a)

c)

- c) 5
- d) 4

86. The following statistics were collected on two groups of cattle

	Group A	Group B
Sample size	45	30
Sample mean	1000 lbs	800 lbs
Sample std. Deviation	80 lbs	70 lbs

Which of the following statement is correct?

- a) Group A is less variable that group B because group A's standard deviation is larger
- b) Group A is relatively less variable than group B because group A's coefficient of variation is smaller
- c) Group A is less variable than group B because standard deviation per animal is smaller
- d) Group A is more variable than group B because sample mean is larger
- 87. If the correlation between two variables is zero it implies that
 - a) Two variables are independent
 - b) Two variables do not have negative correlation
 - c) Two variables are not linearly related
 - d) All the above
- 88. In order to measure the agreement/disagreement for three judges in a beauty contest related to some qualitative traits one must calculate
 - a) Karl Pearson correlation coefficient
 - b) Kendall's Tau
 - c) Spearman's Rank Correlation coefficient
 - d) Both (b) and (c)

89. The rank according to two attributes in a sample are given below :

R1	1	2	3	4	5
R2	5	4	3	2	1

Then rank correlation coefficient between them is

a) 0	b)	+1
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c) -1 d) 0.5

90. If r = 0.6 the coefficient of determination is

- a) 60% b) 36%
- c) 80% d) 40%
- 91. If X and Y are the original variables and U and V are two new variables obtained as U = (X - a)/h and V = (Y - b)/k where a, b, h, and k are some constants then which of the following is true?
 - a) $b_{xy} = b_{uv}$ b) $b_{xy} = (k/h)b_{uv}$
 - c) $b_{xy} = (h/k)b_{uv}$ d) $b_{yx} = (k/h)b_{uv}$
- 92. Find the mode from the following distributions

		Marks :	10	12	15	20	25	35	45	50	60
		No. of students :	4	6	10	14	20	19	10	6	3
a)	20				b) 3	35				
c)	25				d) 4	15				

93. The hourly wages of a sample of 130 system analysts are given below :

Range = 20 mode = 70 variance = 324 median = 74

The coefficient of variation equals

- a) 0.24% b) 2.4%
- c) 24% d) 54%
- 94. The 30 students in a class did a survey of their favourite movie series and recorded the results as follows :

Movies	Frequency
Twilight	10
Harry Potter	6
Narnia	2
High School Musical	9
Pirates of the Caribbean	3
Total	30

What was the relative frequency for High school musical?

a)	0.09	b)	0.3
c)	0.33	d)	0.43

95. The range of a sample gives an indication of the

- a) way in which the values cluster about a particular point
- b) number of observations bearing the same value
- c) maximum variation in the sample
- d) degree to which the mean value differs from its expected value

- 96. The mean of 11 numbers is 7. One of the numbers , 13, is deleted. What is the mean of the remaining 10 numbers?
 - a) 7.7 b) 6.4
 - c) 6.0 d) 5.8
- 97. The numerical value of the standard deviation can never be
 - a) larger than the variance b) zero
 - c) negative d) smaller than the variance
- 98. Which measure of dispersion is expressed in the same units as the units of the observations?
 - a) Variance b) Coefficient of variation
 - c) Standard deviation d) All the above
- 99. The second and fourth moments about mean are 4 and 48 respectively, then the distribution is
 - a) Platykurtic b) Leptokurtic
 - c) Positively skewed d) Mesokurtic

100. In order to specify "different types of cold drinks", the measurement scale used is

- a) Nominal b) Ordinal
- c) Ratio d) Interval

ANSWER SHEET

1	Α	В	С	D	Е
2	Α	В	С	D	Е
3	А	В	С	D	Е
4	Α	В	С	D	Е
5	А	В	С	D	Е
6	Α	В	С	D	Е
7	Α	В	С	D	Е
8	А	В	С	D	Е
9	Α	В	С	D	Е
10	Α	В	С	D	Е
11	Α	В	С	D	Е
12	Α	В	С	D	Е
13	Α	В	С	D	Е
14	Α	В	С	D	Е
15	Α	В	С	D	Е
16	Α	В	С	D	Е
17	Α	В	С	D	Е
18	Α	В	С	D	Е
19	Α	В	С	D	Е
20	Α	В	С	D	Е
21	Α	В	С	D	Е
22	Α	В	С	D	Е
23	Α	В	С	D	Е
24	Α	В	С	D	Е
25	Α	В	С	D	Е

26	А	В	С	D	Е
27	А	В	С	D	Ε
28	Α	В	С	D	Е
29	Α	В	С	D	Е
30	А	В	С	D	Е
31	А	В	С	D	Е
32	А	В	С	D	Е
33	А	В	С	D	Е
34	Α	В	С	D	Е
35	А	В	С	D	Е
36	А	В	С	D	Е
37	А	В	С	D	Е
38	А	В	С	D	Е
39	Α	В	С	D	Е
40	Α	В	С	D	Е
41	А	В	С	D	Е
42	Α	В	С	D	Е
43	Α	В	С	D	Е
44	Α	В	С	D	Е
45	Α	В	С	D	Е
46	Α	В	С	D	Е
47	А	В	С	D	Е
48	А	В	С	D	Е
49	Α	В	С	D	Е
50	Α	В	С	D	Е

51	Α	В	С	D	Е
52	Α	В	С	D	Ε
53	Α	В	С	D	Ε
54	Α	В	С	D	Е
55	Α	В	С	D	Е
56	Α	В	С	D	Е
57	А	В	С	D	Е
58	А	В	С	D	Е
59	Α	В	С	D	Е
60	Α	В	С	D	Е
61	А	В	С	D	Е
62	А	В	С	D	Е
63	А	В	С	D	Е
64	Α	В	С	D	Е
65	А	В	С	D	Е
66	Α	В	С	D	Е
67	А	В	С	D	Ε
68	Α	В	С	D	Ε
69	А	В	С	D	Е
70	Α	В	С	D	Е
71	Α	В	С	D	Е
72	Α	В	С	D	Е
73	Α	В	С	D	Е
74	Α	В	С	D	Е
75	Α	В	С	D	Е



ROUGH WORK

ROUGH WORK

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