Module Name : PhD Statistics-E
Exam Date : 19-Sep-2020 Batch : 12:30-14:30

Sr. No.	Client Question ID	Question Body and Alternatives	Marks	Negative Marks
Objective Question				
1	1	Identify the correct order from the following steps involved in phenomenological approach of research. A1 : Illumination, explication, incubation, creative synthesis, immersion A2 : Explication, immersion, creative synthesis, incubation, illumination A3 : Incubation, illumination, immersion, creative synthesis, explication A4 : Immersion, incubation, illumination, explication, creative synthesis	4.0	1.00
Objective Question				
2	2	In which sampling, a researcher includes those individuals who are willing and are readily avaiable? A1 : Simple Random Sampling A2 : Incidental Sampling A3 : Snowball Sampling A4 : Systematic Sampling	4.0	1.00
Objective Question				
3	3	The basic purpose of using Analysis of Variance in research studies is A1 : for equating groups on one or more variables A2 : for determining the significance of differences among means A3 : for measuring the proficiency level of students A4 : for determining the significance of differences among standard deviations	4.0	1.00
Objective Question				
4	4	In a research study, under the structured questionnaire, which of the following are considered for optimality issue in sampling techniques. (i) Minimizing time; (ii) Minimizing the Standard; (iii) maximizing the volatility; (iv) Minimizing the sample size;	4.0	1.00

		(v) Minimizing the cost; (vi) Maximizing the Precision A1: (i), (ii), (iii) and (vi) are relevant & (iv) , (v) and (vi) are irrelevant A2: (i), (iv), (v) and (vi) are irrelevant & (ii) and (iii) are relevant A3: (i), (iv), (v) and (vi) are relevant & (ii) and (iii) are irrelevant A4: (ii), (iii), (iv) and (vi) are relevant & (i), (iv) , and (v) are irrelevant		
Objective Question				
5	5	When the findings of an experimental research are generalized to target population, the research is said to possess A1: Internal validity A2: Concurrent validity A3: External validity A4: Predictive validity	4.0	1.00
Objective Question				
6	6	For a linear regression model with 20 observations and 6 independent variables satisfying the usual assumptions, the residual sum of squares is found to be 160. Then the maximum likelihood estimate of the error variance is A1: 10 A2: 8 A3: 32 A4: 8.42	4.0	1.00
Objective Question				
7	7	The variance of the OLS estimator of the regression parameters in an underfitted linear model will _____________ when compared with that of the full model. A1: be large A2: be small A3: remain the same	4.0	1.00

		A4 : be half		
Objective Question				
8	8	One indicator for the presence of collinearity among regressors in a linear regression model is that A1 : Individually the regressors will be insignificant but collectively they are significant A2 : Individually the regressors will be significant but collectively they are insignificant A3 : Individually as well as collectively the regressors will be insignificant A4 : Individually as well as collectively the regressors will be significant	4.0	1.00
Objective Question				
9	9	Consider an intercept free linear regression model with 4 independent variables. The total number of subset models that can be formed is A1 : 16 A2 : 4 A3 : 1 A4 : 15	4.0	1.00
Objective Question				
10	10	A large studentized residual value associated with an observation in a linear regression model indicate that the observation A1 : is an outlier A2 : is an inlier A3 : has large leverage value A4 : has small leverage value	4.0	1.00
Objective Question				
11	11	Ridge regression estimator for the regression parameters in a linear model is A1 : is an unbiased estimator A2 : is a biased estimator	4.0	1.00

		A3 : is biased estimator having larger mean square error than the variance of OLS estimator A4 : is biased estimator having smaller mean square error than the variance of OLS estimator		
Objective Question				
12	12	If for a linear regression model with 10 observations and 3 regressors, R^2 is found to be 0.75, then the value of the test statistic for testing the overall significance of the slope parameters is A1 : 3 A2 : 0.33 A3 : 6 A4 : 1	4.0	1.00
Objective Question				
13	13	Distribution free methods A1 : do not depend on the distribution of the random variable on which sample observations are made A2 : do not assume any distribution of the random variable on which sample observations are made A3 : do not make any assumptions on the distribution of the random variable on which sample observations are made A4 : make normality assumption on the distribution of the random variable on which sample observations are made	4.0	1.00
Objective Question				
14	14	Compared to parametric tests, non-parametric tests in general A1 : are more powerful A2 : are less powerful A3 : have same power A4 : none of these	4.0	1.00
Objective Question				
15	15	The distribution of the sign test statistic is A1 : Normal	4.0	1.00

		A2: Bernoulli A3: Binomial A4: Hyper geometric		
Objective Question				
16	16	A design is said to be orthogonal if A1: Treatment contrasts are correlated with block contrast A2: Treatment contrasts are uncorrelated A3: Block contrasts are correlated A4: Treatment contrasts are uncorrelated with block contrast	4.0	1.00
Objective Question				
17	17	Two contrasts $c_i^T\hat{\beta}$ and $c_j^T\hat{\beta}$ are said to be orthogonal if A1: $c_i^T c_j = 1$ A2: $c_i^T c_j = 0$ A3: $c_i^2 = 1$ A4: $c_j^2 = 0$	4.0	1.00
Objective Question				
18	18	In a 2^5 factorial experiment with block size 8, confounding the interactions ABE and ACD, the generalized interaction is A1: ABDE A2: BCDE A3: ABCE A4: ABCD	4.0	1.00
Objective Question				
19	19	For a spilt plot experiment conducted with 5 concentration of an insecticide in main plots and 4 varieties of gram in sub-plots and having 3 replications, main plot error degrees of freedom will be	4.0	1.00

		A1 : 8 A2 : 10 A3 : 24 A4 : 6		
Objective Question				
20	20	A Balanced Incomplete Block Design (BIBD) with parameters (v, b, r, k, λ) is A1 : Connected, Balanced, Orthogonal A2 : Connected, Not Balanced, Orthogonal A3 : Connected, Balanced, Non-Orthogonal A4 : Not Connected, Balanced, orthogonal	4.0	1.00
Objective Question				
21	21	In conducting a 2^4 experiment with 4 factors A, B, C, D, if blocks of size 4 only are available and the effects ABC, BCD, AD are confounded then the composition of key block is A1 : '1', bc, abd, acd A2 : '1', ad, bc, abcd A3 : '1', ad, cd, ac A4 : '1', ab, cd, abcd	4.0	1.00
Objective Question				
22	22	In a 3^3 factorial with factors A, B and C each at 3 levels, the interaction A^2BC^2 is same as the interaction A1 : ABC A2 : AB^2C A3 : AB^2C^2 A4 : A^2BC	4.0	1.00

Objective Question

23	23	A Balanced Incomplete Block Design (BIBD) with 4 treatments arranged in 6 blocks of size 2 each, has an efficiency factor equal to A1 : 4/5 A2 : 3/4 A3 : 2/3 A4 : 1/2	4.0	1.00

Objective Question

24	24	A sufficient estimator of θ based on a random sample of size n from Uniform distribution U(0, θ) is given by A1 : $\frac{1}{n}\sum_{i=1}^{n} X_i$ A2 : $\sqrt{\sum_{i=1}^{n} X_i^2}$ A3 : $Max.(X_1, \dots, X_n)$ A4 : $Min.(X_1, \dots, X_n)$	4.0	1.00

Objective Question

25	25	Suppose $X_1, \dots, X_{10}; Y_1, \dots, Y_{10}$ are independent random variables where X_i's have density $f_X(x) = \frac{1}{\lambda}\, e^{-\frac{x}{\lambda}}; x > 0$ and Y_i's have density $f_Y(y) = \frac{1}{2\lambda}\, e^{-\frac{y}{2\lambda}}; y > 0$. The maximum likelihood estimator of λ based on all X_i's and Y_i's is A1 : $\frac{\bar{X}+\bar{Y}}{2}$ A2 : $\frac{\bar{X}+\bar{Y}}{3}$ A3 : $\frac{2\bar{X}+\bar{Y}}{4}$ A4 : $\frac{\bar{X}+2\bar{Y}}{5}$	4.0	1.00

Objective Question

26	26		4.0	1.00

		Let $\begin{pmatrix} X_1 \\ X_2 \end{pmatrix} \sim N\left[\begin{pmatrix} 2 \\ 3 \end{pmatrix}, \begin{pmatrix} 1 & 1/2 \\ 1/2 & 3 \end{pmatrix}\right]$. Then $Y_1 = X_1 + X_2$ and $Y_2 = aX_1 + bX_2$ are independent if and only if A1 : $a + b = 0$ A2 : $3a + 7b = 0$ A3 : $2a + 3b = 0$ A4 : $3a + b = 0$		
Objective Question				
27	27	The dispersion matrix of a random vector $(X_1, X_2, X_3)'$ is $\begin{pmatrix} 10 & 5 & 5 \\ 5 & 9 & a \\ 5 & a & 16 \end{pmatrix}$. The value of a, so that $X_1 + X_2 + X_3$ and $X_1 - 2X_2 + X_3$ are uncorrelated is A1 : 8 A2 : 21 A3 : 13 A4 : 15	4.0	1.00
Objective Question				
28	28	The correlation structure between the x-variates in a dimensionality reduction can be obtained in A1 : Canonical Correlation Analysis A2 : Factor Analysis A3 : Cluster Analysis A4 : Discriminant Analysis	4.0	1.00
Objective Question				
29	29	Which of the following is not a test that can be used to evaluate the overall model fit for logistic regression models? A1 : Change in likelihood A2 : Hosmer-Lomeshow goodness fit A3 Cox and Snell R squared	4.0	1.00

		A3 : A4 : Wald test		

Objective Question

30	30	Suppose $n_1 = 19$, $n_2 = 21$ and $n_3 = 23$ for a one factor Analysis of Variance (ANOVA), the degrees of freedom for total (df_{total}) would be A1 : 2 A2 : 3 A3 : 60 A4 : 62	4.0	1.00

Objective Question

31	31	The probability distribution function which is not a member of exponential family but satisfies monotonic likelihood ratio property is A1 : Binomial A2 : Poisson A3 : Normal A4 : Hypergeometric	4.0	1.00

Objective Question

32	32	If the p-component vector Y is distributed according to N $(0, \Sigma)$ and Σ is non-singular then $Y^T\Sigma^{-1}Y$ is distributed according to A1 : χ^2 distribution with p degrees of freedom A2 : χ^2 distribution with (p-1) degrees of freedom A3 : $N_P(0, Y^T\Sigma Y)$ A4 : $N_P(0, Y^T\Sigma^{-1} Y)$	4.0	1.00

Objective Question

33	33	You are given that $\mu_X = 14, \sigma_X^2 = 36, \mu_Y = 14, \sigma_Y^2 = 49$ and Y = 14 in the prediction equation for predicting Y from X. Which of the following is the variance of the predicted values of Y?	4.0	1.00

		A1: 0 A2: 14 A3: 36 A4: 49		
Objective Question				
34	34	If the relationship between two variables is linear, then which one of the following is correct? A1: All the points must fall on a curve line A2: The relationship is best represented by a curved line A3: All the points must fall on straight line A4: The relationship is best represented by a straight line	4.0	1.00
Objective Question				
35	35	For any non-negative random variable X, which one of them is true? A1: $E\,X + E\left(\frac{1}{X}\right) > 2$ A2: $E\,X - \ E\left(\frac{1}{X}\right) > 2$ A3: $E\,X + E\left(\frac{1}{X}\right) \geq 2$ A4: $E\,X + E\left(\frac{1}{X}\right) \leq 2$	4.0	1.00
Objective Question				
36	36	The p.d.f. of a Normal distribution is given by $f(x) = \frac{8}{\sqrt{2\pi}}e^{-4(x-1)};\ -\infty < x < \infty$.Then the mean and standard deviation is A1: (1/2, 1/8) A2: (1/8, 1/2) A3: (1/3, 3/8) A4: (3/8, 1/3)	4.0	1.00

Objective Question

37	37	The distribution function of a random variable X is given by $$F(x) = \begin{cases} 0; & x \le 1 \\ \frac{1}{16}(x-1)^4; & 1 \le x \le 3 \\ 1; & x > 3 \end{cases}$$ Then E(X) is equal to A1 : 12/5 A2 : 11/5 A3 : 13/5 A4 : 17/5	4.0	1.00

Objective Question

38	38	The m.g.f. of a certain continuous distribution is $e^{2t+\frac{3t^2}{2}}$. Then the mean and variance are A1 : (2, 3) A2 : $(2, \sqrt{3})$ A3 : (2, 1/3) A4 : $(2, 1/\sqrt{3})$	4.0	1.00

Objective Question

39	39	A discrete random variable X has the following p.m.f.	4.0	1.00

x	-1	1
p(x)	1/2	1/2

Then the characteristic function $\phi_X(t)$ is equal to

A1 : *sin t*

A2 : *cos t*

A3 : *tan t*

A4 : *cot t*

Objective Question

40	40	If $G_X(s)$ denote the p.g.f. of a random variable X, then the p.g.f. of the r.v. $aX + b$ is A1 : $s^b\, G_X(s^a)$ A2 : $s^a\, G_X(s^b)$ A3 : $ab\, G_X(s)$ A4 : $a/b\, G_X(s)$	4.0	1.00

Objective Question

41	41	Suppose X1, . . . , Xn are i.i.d random variables of size 100 which have uniform distribution on [a − 2, a + 2], where ‘a’ is unknown. Suppose the random sample produces sample mean equal to 3. Then the 95% confidence interval for a will be? A1 : (2.73, 3.27) A2 : (2.37, 3.77) A3 : (2.05, 3.27) A4 : (2.37, 3.07)	4.0	1.00

Objective Question

42	42	Let φ be a test function having maximum power at each $\theta \in \Theta_1$ from among the tests in $\mathcal{U}_\alpha$ then such test is called as A1 : Most Powerful test A2 : Uniformly Most Powerful test A3 : Uniformly Most Powerful Unbiased test A4 : Uniformly Most Powerful Similar test	4.0	1.00

Objective Question

43 | 43 | Let the distribution of a random variable X under H_0 and H_1 be | 4.0 | 1.00

X	1	2	3	4	5	6
$f_0(x)$	0.01	0.01	0.01	0.01	0.01	0.95
$f_1(x)$	0.05	0.04	0.03	0.02	0.01	0.85

Obtain the power of the test for size 0.03 for testing $H_0: f=f_0$ Vs $H_1: f=f_1$

A1 : 0.15

A2 : 0.12

		A3 : 0.85 A4 : 0.88		
Objective Question				
44	44	Let $X_1, X_2, \ldots, X_n$ be a random sample of size n from $N(\mu,1)$, $\mu \in \mathbb{R}$. The likelihood ratio test for testing the $H: \mu \leq \mu_0 \; vs \; K: \mu > \mu_0$ is A1 : $e^{\frac{n}{2}(\bar{x}-\mu_0)^2}$ A2 : $e^{-\frac{n}{2}(\bar{x}+\mu_0)^2}$ A3 : $e^{-\frac{n}{2}(\bar{x}-\mu_0)^2}$ A4 : $e^{\frac{n}{2}(\bar{x}+\mu_0)^2}$	4.0	1.00
Objective Question				
45	45	If $X_1, X_2, \ldots, X_n$ are i.i.d $N(N(\theta,\sigma^2)$, σ^2 is unknown. Then the likelihood ratio test for testing $H_0: \theta = \theta_0 \; vs \; H_1: \theta \neq \theta_0$ leads to A1 : One sided Chi-Square test A2 : One sided student's t-test A3 : Two sided student's t-test A4 : Two sided chi-square test	4.0	1.00
Objective Question				
46	46	The variance of the moving average M_i is A1 : $\frac{\sigma^2}{w}$ A2 : $\frac{\sigma^2}{w-1}$ A3 : σ^2 A4 : $\frac{\sigma^2}{n} - 1$	4.0	1.00
Objective Question				
47	47	One of the approach to using an $\bar{x}$ chart to monitor the fraction of nonconforming units, or the fraction of units exceeding specifications, is called _______________	4.0	1.00

		A1 : Modified control chart A2 : Acceptance control chart A3 : Relative range control chart A4 : Cusum chart		
Objective Question				
48	48	In single sampling plan, let 'p' be the quality and P_a be the probability of lot acceptance, then the average total inspection (ATI) per lot will be A1 : ATI = n + (P_a)(N-n) A2 : ATI = n + (1-P_a) A3 : ATI = n + (1-Pa)(N-n) A4 : ATI = (1-P_a)(N-n)	4.0	1.00
Objective Question				
49	49	In sequential sampling plan, the expression to determine 's' in constructing the limit lines is A1 : $s = log[(1-p_1)(1-p_2)]/k$ A2 : $s = log[(p_1)(1-p_2)]/k$ A3 : $s = log[(1-p_1)/(p_2)]/k$ A4 : $s = log[(1-p_1)/(1-p_2)]/k$	4.0	1.00
Objective Question				
50	50	For estimating the population proportion P in a population having N units, the variance of the estimator *p* of *P*, based on a sample of size *n*, is A1 : $\frac{N}{N-1}.\frac{PQ}{n}$ A2 : $\frac{N}{N-1}.\frac{PQ}{N}$ A3 : $\frac{N-n}{N-1}.\frac{PQ}{n}$ A4	4.0	1.00

		: $\frac{N-1}{N-n} \cdot \frac{PQ}{n}$		
Objective Question				
51	51	If larger units have greater probability of their inclusion in the sample it is known as A1 : selection with replacement A2 : selection with probability proportional to size A3 : selection with constant probability A4 : probability selection	4.0	1.00
Objective Question				
52	52	The name “Two- Stage Sampling" is due to __________ A1 : Cochran A2 : Fisher A3 : Midzuno A4 : Mahalanobis	4.0	1.00
Objective Question				
53	53	Random sampling error A1 : is the difference between a survey that includes only those who responded and a survey that also includes those who failed to respond. A2 : is a function of sample size. A3 : results from the nature of a study's design and the inappropriate or random administration of the sampling process. A4 : does not occur in non-probability samples.	4.0	1.00
Objective Question				
54	54	Which of the following best describes why quota sampling is widely used in market research? A1 : It allows the interviewer to choose who should be interviewed A2 : It is easier to use quotas to allocate fieldwork to interviewers A3 Achieving a representative sample is not usually important	4.0	1.00

		: A4 : The client and/or the research supplier have extensive knowledge of the relevant characteristics of the population of interest on which to base quotas		

Objective Question

55	55	A simple random sample of size n is drawn from a finite population of N units with replacement. The probability that the ith $(1 \le i \le N)$ unit is included in the sample is A1 : $\left(\frac{N-1}{N}\right)^n$ A2 : $1-\left(1-\frac{1}{N}\right)^n$ A3 : n/N A4 : $\frac{n(n-1)}{N(N-1)}$	4.0	1.00

Objective Question

56	56	For a random variable X degenerate at $a \in R$ A1 : $P(X=a)= 0$ A2 : $P(X=a)=\infty$ A3 : $P(X=a)=-\infty$ A4 : $P(X=a)= 1$	4.0	1.00

Objective Question

57	57	If A and B are two events such that P(A)= P(B)=1/3 and P(A/B) =1/6, what is P(A' $\cap$ B')? A1 : 7/18 A2 : 1/6 A3 : 1/3 A4 : 1/2	4.0	1.00

Objective Question

58	58	Strong Law of Large Numbers is based on the concept of A1 : Weak convergence	4.0	1.00

A2: Almost sure convergence

A3: Convergence in probability

A4: Convergence in r^{th} mean

Objective Question

59	59	The percentile point function of the Weibull distribution is A1: $G(p) = \left(-ln(1+p)\right)^{1/\gamma}; 0 \le p < 1 ; \gamma > 0$ A2: $G(p) = \left(ln(1-p)\right)^{1/\gamma}; 0 \le p < 1 ; \gamma > 0$ A3: $G(p) = \left(-ln(1-p)\right)^{1/\gamma}; 0 \le p < 1 ; \gamma > 0$ A4: $G(p) = \left(-ln(1-p^2)\right)^{1/\gamma}; 0 \le p < 1 ; \gamma > 0$	4.0	1.00

Objective Question

60	60	The three-parameter Weibull distribution reduces to the two parameter Exponential distribution, when β takes the value A1: $\beta < 1$ A2: $\beta = 1$ A3: $\beta > 1$ A4: $\beta = 0$	4.0	1.00

Objective Question

61	61	Consider the vector space V of real polynomials of degree less than or equal to n. Fix distinct real numbers as $a_0, a_1, \ldots, a_k$. For p∈V, max $\{\lvert p(a_j)\rvert : 0 \le j \le k\}$ defines norm on V A1: only if k < n A2: only if k ≥ n A3: if k + 1 > n A4: if k + 1 ≤ n	4.0	1.00

Objective Question				
62	62	Let W_1, W_2, W_3 be three distinct subspaces of R^{10} such that W_i has dimension 9. Let $W_1 \cap W_2 \cap W_3$. Then we can conclude that A1: W may not be a subspace of R^{10} A2: $\dim(W) \leq 8$ A3: $\dim(W) \leq 5$ A4: $\dim(W) \leq 6$	4.0	1.00
Objective Question				
63	63	Let A be n×n matrix with real entries. Define $(x,y)_A = (Ax, Ay)$, $x, y \in R^n$. Then $(x,y)_A$ defined as inner product if and only if A1: $\mathrm{Ker}(A) = \{0\}$ A2: rank (A) =1 A3: all eigen values of A are positive A4: all eigen values of A are negative	4.0	1.00
Objective Question				
64	64	Let A_{3x4} be a real matrix of rank 2. Then the rank of A^TA is A1: exactly 2 A2: exactly 3 A3: exactly 4 A4: exactly 1	4.0	1.00
Objective Question				
65	65	Let f be a non-zero symmetric bilinear form on R^3. Suppose that there exist linear transformation $T_i: R_3 \rightarrow R$, i=1,2 such that for all $\alpha, \beta \in R^3$, $f(\alpha,\beta) = T_1(\alpha)T_2(\beta)$. Then (i) rank(f)=1 (ii) f is a positive semi-definite or negative semi-definite (iii) $\{ \alpha \in R^3 : f(\alpha,\alpha)=0\}$ is a linear subspace of dimension 2 Which of the statements is correct? A1: (i) only	4.0	1.00

		A2: (ii) only A3: (iii) only A4: (i), (ii) and (iii)		

Objective Question

66	66	Consider the AR(1) model with disturbances having zero mean and unit variance $$y_t = 0.2 + 0.4y_{t-1} + u_t$$ The value of the autocorrelation function at lag 3 for the above model will be A1: 0.4 A2: 0.064 A3: 0 A4: 0.076	4.0	1.00

Objective Question

67	67	For a stationary autoregressive process, shocks will A1: eventually die away A2: persist indefinitely A3: grow exponentially A4: never occur	4.0	1.00

Objective Question

68	68	If the Engel-Granger test is applied to the residuals of a potentially cointegrating regression, what would be the interpretation of null hypothesis? A1: The variables are cointegrated. A2: The variables are not cointegrated. A3: Both variables are stationary. A4: Both variables are not stationary.	4.0	1.00

Objective Question				
69	69	Autocovariance measure is A1: linear dependence between multiple points on different series observed at different times. A2: quadratic dependence between two points on the same series observed at different times. A3: linear dependence between multiple points on different series observed at same times. A4: linear dependence between two points on the same series observed at different times.	4.0	1.00

Objective Question				
70	70	Which of the following is not a necessary condition for weakly stationary time series? A1: Mean is constant and does not depend on time. A2: Time series under considerations is finite variance process. A3: Time series is Gaussian. A4: Autocovariance depends on moments in time through their difference.	4.0	1.00

Objective Question				
71	71	Index numbers are tools, over a period of time, for measuring A1: changes of variables A2: changes of attributes A3: changes of mean A4: changes of standard error	4.0	1.00

Objective Question				
72	72	Existence of alternative optimal basic feasible solution is indicated as A1: The net evolution of none of the non basic variable is zero on par with basic variables in the final simplex table A2: The net evolution of all non basic variable should be negative on par with basic variables in the final simplex table A3: The net evolution all basic variables are negative on par with non basic variables in the final simplex table A4 The net evolution of at least one non basic variable should be zero on par with basic variables in the final simplex table	4.0	1.00

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Objective Question				
73	73	When both primal and dual Linear Programming Problems (LPP) possesses the optimal basic feasible solution, then A1: The value of the objective functions in both problems are not necessarily equal A2: The value of the objective functions in primal LPP is more than its corresponding dual LPP A3: The value of the objective functions in primal LPP is less than its corresponding dual LPP A4: The value of the objective functions in both problems are equal	4.0	1.00
Objective Question				
74	74	When the demand over certain period of time is not known with certainty, then the those inventory models may be classified as A1: Probabilistic Models A2: Deterministic Models A3: Static Models A4: Constant Rate Models	4.0	1.00
Objective Question				
75	75	The value of optimal ordering interval (t*) in economic lot size system with uniform demand is _________________ A1: Is directly proportional to the square root of holding cost A2: Is directly proportional to the square root of set up cost A3: Is inversely proportional to the square root of holding cost A4: Is inversely proportional to the square root of set up cost	4.0	1.00
Objective Question				
76	76	Let T be CAN for θ so that $T \sim AN(\theta, \sigma_T^2(\theta)/a_n^2)$ and let Ψ be a differentiable function such that $\frac{d\psi}{d\theta}$ is continuous and non vanishing then Ψ(T) is CAN for Ψ(θ) with asymptotic variance: A1: $\left(\frac{d\psi}{d\theta}\right)^2 \sigma_T^2(\theta)$	4.0	1.00

		A2: $\left(\frac{d\psi}{d\theta}\right)^2 a_n^2\sigma_T^2(\theta)$ A3: $\left(\frac{d\psi}{d\theta}\right)^2 \frac{\sigma_T^2(\theta)}{a_n^2}$ A4: $\left(\frac{d\psi}{d\theta}\right)^2 \frac{\sigma_T^4(\theta)}{a_n^4}$		
Objective Question				
77	77	If $X \sim f(x), y \sim g(y)$, then the distribution of Z=X +Y is A1: $P(Z=z)=\sum_{c=-\infty}^{\infty}P(X=c)P(Y=c)$ A2: $P(Z=z)=\sum_{c=-\infty}^{\infty}P(X=c)P(Y=z-c)$ A3: $P(Z=z)=\sum_{c=-\infty}^{\infty}P(X=c+y)P(Y=x+c)$ A4: $P(Z=z)=\sum_{c=-\infty}^{\infty}P(X=x)P(Y=c)$	4.0	1.00
Objective Question				
78	78	The quadratic form $6x_1^2+3x_2^2+14x_3^2+4x_2x_3+18x_1x_3+4x_1x_2$ is A1: Positive definite A2: Negative definite A3: Positive semi definite A4: Negative semi definite	4.0	1.00
Objective Question				
79	79	The probability density function of a Markov process is A1: $P(X_1,X_2,X_3.......X_N) = P(X_1)P(X_2/X_1)P(X_3/X_2).......P(X_N/X_{N-1})$	4.0	1.00

		A2: $P(X_1,X_2,X_3.......X_N) = P(X_1)P(X_1/X_2)P(X_2/X_3).......P(X_{N-1}/X_N)$ A3: $P(X_1,X_2,X_3.......X_N) = P(X_1)P(X_2)P(X_3).......P(X_N)$ A4: $P(X_1,X_2,X_3......X_N) = P(X_1)P(X_2 * X_1)P(X_3 * X_2)........P(X_N * X_{N-1})$		
Objective Question				
80	80	If calls arrive at a telephone exchange such that the time of arrival of any call is independent of the time of arrival of earlier or future calls, the probability distribution function of the total number of calls in a fixed time interval will be A1: Poisson A2: Gaussian A3: Exponential A4: Gamma	4.0	1.00
Objective Question				
81	81	Dual Simplex method is used to solve a Linear Programming Problem when A1: The solution is non-optimum and infeasible. A2: The solution is optimum and infeasible. A3: The solution is non-optimum and feasible. A4: The solution is optimum and degenerate.	4.0	1.00
Objective Question				
82	82	In post-optimality analysis of Linear Programming Problem, the feasibility condition is affected due to (i) Changes in the cost vector (ii) Changes in the requirement vector (iii) Addition and deletion of linear constraints Choose the correct option. A1: (i) A2: (i) and (ii) A3: (i) and (iii) A4: (ii) and (iii)	4.0	1.00

Objective Question				
83	83	The mean of non-central F distribution with n_1 and n_2 degrees of freedom and non-centrality parameter λ_1 is A1: $\frac{n_1}{n_2}\frac{n_2-2}{n_1+\lambda_1}$ A2: $\frac{n_1}{n_2}\frac{n_2-2}{n_1}$ A3: $\frac{n_2}{n_1}\frac{n_1+\lambda_1}{n_2-2}$ A4: $\frac{n_1+\lambda_1}{n_2-2}$	4.0	1.00
Objective Question				
84	84	Let $X_1, X_2, \ldots, X_n$ be i.i.d random variables with mean μ and variance σ^2 . If $\frac{X_1^2+X_2^2+\ldots+X_n^2}{n} \xrightarrow{p} c$, where c is a positive constant. The value of c is A1: μ A2: $\mu+\sigma$ A3: σ^2 A4: $\mu^2 + \sigma^2$	4.0	1.00
Objective Question				
85	85	The probability density function of a Poisson distribution with parameter θ, truncated at origin is A1: $\frac{e^{-\theta}\theta^x}{x!}\frac{1}{1-e^{-\theta}}$ A2: $\frac{e^{-\theta}\theta^x(1-e^{-\theta})}{x!}$ A3: $\frac{1}{1-e^{-\theta}}$ A4: $1-e^{-\theta}$	4.0	1.00
Objective Question				
86	86	If X and Y are two independent random variables with cumulative distribution functions F_1 and F_2, then the convolution (F) of F_1 and F_2 is given by A1: $F(x) = \int_{-\infty}^{\infty} F_1(x-y)dF_2(y)$	4.0	1.00

		A2 : $F(x) = \int_{-\infty}^{\infty} F_1(x) dF_2\,(y)$ A3 : $F(x) = \int_{-\infty}^{\infty} F_1(x) dF_2\,(x-y)$ A4 : $F(x) = \int_{-\infty}^{\infty} F_2(x-y) dF_2\,(y)$		

Objective Question

87	87	Let $(X_1, X_2, \ldots X_n)$ be a random sample of observations with mean μ and finite variance. Then for estimating μ, the statistic $T_n = 2\sum_{i=1}^{n} i X_i / n(n+1)$ is A1 : unbiased and consistent A2 : biased and consistent A3 : unbiased but not consistent A4 : biased and not consistent	4.0	1.00

Objective Question

88	88	If a sequence of random variables is convergent in probability then as $n \to \infty$, $P(\lvert X_n - X \rvert < \epsilon)$ tends to A1 : 1 A2 : 0 A3 : ∞ A4 : $-\infty$	4.0	1.00

Objective Question

89	89	A hypothesis is rejected at the level of significance $\alpha = 5\%$ by a test. Then which one of the following statements is true regarding the p-value of the test. A1 : $p = 5\%$ A2 : $p < 5\%$ A3 : $p > 5\%$ A4 : Any one of the three can be true	4.0	1.00

Objective Question				
90	90	If Type-I and Type-II errors are kept fixed, then the power of the test increases, A1 : if there is an increase of sample size A2 : if sample size remains unchanged A3 : if there is a decrease of sample size A4 : if the test is unbiased	4.0	1.00
Objective Question				
91	91	Let ${}_nD_x$ be the number of deaths in the age group (x, x+n) and ${}_nP_x$ be the total population of the age group x to x+n, then the age specific death rate for the age group x to x+n (${}_nm_x$) is given by A1 : $\frac{{}_nD_x}{{}_nP_x} X1000$ A2 : $\frac{{}_nP_x}{{}_nD_x} X1000$ A3 : $\frac{{}_nP_x}{{}_nD_x} X100$ A4 : $\frac{{}_nD_x}{{}_nP_x} X100$	4.0	1.00
Objective Question				
92	92	In R program, list is an object that contains A1 : only numeric vectors A2 : only matrices A3 : only logical vectors A4 : either numeric vectors or matrices or logical vectors	4.0	1.00
Objective Question				
93	93	What will be the output if the following source code is run in R program? mean (c(10, 5, 15, NA, 6, NA)) A1 : 9 A2 : NA	4.0	1.00

		A3 : 6 A4 : 0		
Objective Question				
94	94	In the context of cluster validity measures, which among the following is true for F-measure? A1 : it is the arithmetic mean of precision and recall A2 : it is the geometric mean of precision and recall A3 : it is the harmonic mean of precision and recall A4 : it is product of precision and recall	4.0	1.00
Objective Question				
95	95	Single linkage method in agglomerative clustering makes use of ______ A1 : the average distance among pairs of objects between two clusters A2 : the Minimum distance among pairs of objects between two clusters A3 : the Maximum distance among pairs of objects between two clusters A4 : the Distance between two cluster centers	4.0	1.00
Objective Question				
96	96	In which phase of a clinical trial, Maximum Tolerance Dose is achieved? A1 : Phase I A2 : Phase I and III A3 : Phase III A4 : Phase II	4.0	1.00
Objective Question				
97	97	In parallel line assay, the intercept is A1 : $\beta + \log \rho$	4.0	1.00

		A2 : $\alpha + \beta \log \rho$ A3 : $\alpha + \beta\, \rho$ A4 : $\beta \log \rho$		
Objective Question				
98	98	In which of the following design samples are collected over time A1 : Simple randomized design A2 : Fixed sample design A3 : Sequential design A4 : Cross over design	4.0	1.00
Objective Question				
99	99	Unique feature is that model includes people who do not have the event-incomplete data on survival time A1 : Censoring A2 : Symmetry A3 : Truncation A4 : Uncensoring	4.0	1.00
Objective Question				
100	100	The probability density function of X is $f(x) = \begin{cases} \frac{1}{4}, & \lvert x \rvert < 2 \\ 0 & otherwise \end{cases}$ then P(2X +3 > 5) is equal to A1 : 1/3 A2 : 1/2 A3 : 1/7 A4 : 1/4	4.0	1.00