Department of Statistics

Question Bank

Sem 5 (ATKT)

Paper 1 (Code – USST501)

SR. No.	QUESTION TEXT	OPTION 1	OPTION 2	OPTION 3	OPTION 4
1	The result of an experiment is known as ____________	Outcome	Sample Space	Event	Random experiment
2	The set of all possible outcomes of a random experiment is known as ___________	Event	Outcome	Sample Space	Random Experiment
3	Any particular performance of a random experiment is called as	Sample Point	Sample Space	Event	Trial
4	Any subset of sample space of an experiment is called as	Event	Outcome	Sample Space	Random Experiment
5	Events A and B are said to be mutually exclusive if and only if	$P(A \cap B) = 1$	$P(A \cap B) = \emptyset$	$P(A \cup B) = 1$	$P(A \cup B) = \emptyset$
6	Events A and B are said to be mutually exhaustive if and only if	$P(A \cup B) = S$	$P(A \cap B) = \emptyset$	$P(A \cup B) = 1$	$P(A \cup B) = \emptyset$
7	If $S = \{A_1, A_2, \ldots\ldots, A_n\}$, where n is finite then $\sum_{i=1}^{n} P(A_i) =$	0	1	-1	2
8	An old man says that chances of rain on a particular day is 60%. It is an example of	Statistical definition of probability	Mathematical definition of probability	Axiomatic definition of probability	Subjective probability
9	If P(A) = 0.3, P(B) = 0.2 and P(A∩B) = 0.3 then P(AUB) =	0.2	0.8	0.11	0.6

10	If P(A) = 0.7, P(B) = 0.25 and P(A∩B) = 0.15 then P(AUB) =	0.95	1	0.8	0.85
11	Two dice are thrown simultaneously. The probability of getting a sum of 9 is	$\frac{1}{10}$	$\frac{3}{10}$	$\frac{1}{9}$	$\frac{4}{9}$
12	If P(A) =1 , the event A is called as	Impossible event	Mutually exclusive event	Mutually exhaustive event	Certain event
13	P (A / B) =	$\frac{P(A \cap B)}{P(B)}$	$\frac{P(A \cap B)}{P(A)}$	$\frac{P(A \cup B)}{P(B)}$	$\frac{P(A \cup B)}{P(A)}$
14	P (B / A) =	$\frac{P(A \cap B)}{P(B)}$	$\frac{P(A \cap B)}{P(A)}$	$\frac{P(A \cup B)}{P(B)}$	$\frac{P(A \cup B)}{P(A)}$
15	The number of arrangements in which we can put ‘r’ indistinguishable balls in ‘n’ different cells is given by	$\binom{n}{r}$	$\binom{n+r-1}{r}$	$\binom{n-1}{r}$	$\binom{n}{r-1}$
16	The number of arrangements of putting ‘r’ (r>n) indistinguishable balls in ‘n’ cells such that no cell is empty is given by	$\binom{r-1}{n-1}$	$\binom{r-1}{n-1}$	$\binom{r-2}{n-1}$	$\binom{r}{rn-1}$
17	When we distribute ‘r’ balls at random to ‘n’ cells then each arrangement has probability	$\frac{2}{n^r}$	$\frac{1}{n^r}$	n^r	$2n^r$
18	If two events A and B are mutually independent then P(A∩B) =	P(A) + P(B)	P(A) - P(B)	P(A) × P(B)	P(A) ÷ P(B)
19	If A and B are two events, then probability of occurrence of atleast one event is represented as	$P(A \cap B)$	$P(A \cup B)$	$P(A/B)$	$P(A+B)$
20	If A and B are two events, then probability of occurrence of both the events simultaneously is represented as	$P(A \cap B)$	$P(A \cup B)$	$P(A/B)$	$P(A+B)$
21	Probability lies between	-1 to 1	0 to 1	-1 to 0	0 to 2
22	Probability of the impossible event is	0	1	-1	0.5
23	$A \cup \bar{A} =$	1	0	S	S-1
24	$P(\bar{A} \cap B) =$	$P(B) - P(A \cap B)$	$P(B) - P(A \cup B)$	$P(A) - P(A \cap B)$	$P(A) - P(A \cup B)$
25	$P(A \cap \bar{B}) =$	$P(B) - P(A \cap B)$	$P(B) - P(A \cup B)$	$P(A) - P(A \cap B)$	$P(A) - P(A \cup B)$
26	$A \cap \bar{A} =$	0	S	ϕ	1
27	$A \cup \bar{A}$ are _________ events	Mutually Exclusive	Certain	Mutually Exhaustive	Impossible

28	$P(A \cup B) =$	$P(A) - P(B) - P(A \cap B)$	$P(A) - P(B) + P(A \cap B)$	$P(A) + P(B) - P(A \cap B)$	$P(A) + P(B) + P(A \cap B)$
SR. No.	QUESTION TEXT	OPTION 1	OPTION 2	OPTION 3	OPTION 4
1	If X is a non-negative variable, then for any a (a>0) then	$P(X \leq a) \leq \frac{E(X)}{a}$	$P(X \leq a) = \frac{E(X)}{a}$	$P(X \leq a) \geq \frac{E(X)}{a}$	$P(X \leq a) \neq \frac{E(X)}{a}$
2	If X is a non-negative variable, then for any a (a>0) then	$P(X \geq a) \leq \frac{E(X)}{a}$	$P(X \geq a) = \frac{E(X)}{a}$	$P(X \geq a) \geq \frac{E(X)}{a}$	$P(X \geq a) \neq \frac{E(X)}{a}$
3	If X is a non-negative variable, then for any a (a>0) then	$P(\|X\| \geq a^r) \leq \frac{E(X)}{a^r}$	$P(\|X\| \geq a^r) \geq \frac{E(X)}{a^r}$	$P(\|X\| \geq a^r) = \frac{E(X)}{a^r}$	$P(\|X\| \geq a^r) \neq \frac{E(X)}{a^r}$
4	If X is a random variable with mean μ and variance σ^2, then for any positive number k, we have	$P\{\|X-\mu\| \geq k\sigma\} \geq \frac{1}{k^2}$	$P\{\|X-\mu\| \geq k\sigma\} \leq \frac{1}{k^2}$	$P\{\|X-\mu\| \geq k\sigma\} \neq \frac{1}{k^2}$	$P\{\|X-\mu\| \geq k\sigma\} = \frac{1}{k^2}$
5	If X is a random variable with mean μ and variance σ^2, then for any positive number k, we have	$P\{\|X-\mu\| < k\sigma\} \geq 1 - \frac{1}{k^2}$	$P\{\|X-\mu\| < k\sigma\} \leq \frac{1}{k^2}$	$P\{\|X-\mu\| < k\sigma\} \neq 1 - \frac{1}{k^2}$	$P\{\|X-\mu\| < k\sigma\} = \frac{1}{k^2}$
6	Chebyshev's inequality states that	$P\{\|X-\mu\| < C\} \geq 1 - \frac{1}{C^2}$	$P\{\|X-\mu\| < C\} \leq \frac{1}{C^2}$	$P\{\|X-\mu\| < C\} \neq 1 - \frac{1}{C^2}$	$P\{\|X-\mu\| < C\} = \frac{1}{C^2}$
7	Boole's inequality states that, for n events $A_1, A_2, \ldots\ldots, A_n$	$P\left(\bigcup_{i=1}^{n} A_i\right) \geq \sum_{i=1}^{n} P(A_i)$	$P\left(\bigcup_{i=1}^{n} A_i\right) \neq \sum_{i=1}^{n} P(A_i)$	$P\left(\bigcup_{i=1}^{n} A_i\right) \leq \sum_{i=1}^{n} P(A_i)$	$P\left(\bigcup_{i=1}^{n} A_i\right) = \sum_{i=1}^{n} P(A_i)$
8	Cauchy-Schwartz inequality states that, it X and Y are random variables having real values then	$[E(XY)]^2 \leq E(X^2)E(Y)$	$[E(XY)]^2 \leq E(X)E(Y^2)$	$[E(XY)]^2 \leq E(X)E(Y)$	$[E(XY)]^2 \leq E(X^2)E(Y^2)$
9	WLLN stands for	Weak Law of Linear Numbers	Weak Law of Least Numbers	Weak Law of Large Numbers	Weak Law of Log Numbers

SR. No.	QUESTION TEXT	OPTION 1	OPTION 2	OPTION 3	OPTION 4
1	If X is a random variable having probability function function f(x) then its M.G.F. is given by	$E(e^{tx})$	$E(e^{x})$	$E(e^{t})$	$E(e^{tx}+1)$
2	If X is a discrete random variable, its M.G.F. is given by	$\sum_x e^{tx}\, P(x)$	$\sum_x e^{tx}\, P(x)dx$	$\int e^{tx}\, f(x)\, dx$	$\int e^{tx}\, f(x)$
3	If X is a continuous random variable, its M.G.F. is given by	$\sum_x e^{tx}\, P(x)$	$\sum_x e^{tx}\, P(x)dx$	$\int e^{tx}\, f(x)\, dx$	$\int e^{tx}\, f(x)$
4	M.G.F. stands for	Mean Generating Function	Mode Generating Function	Median Generating Function	Moment Generating Function
5	$M(t_1,t_2)$ represents	M.G.F. of X and Y	M.G.F. of X	M.G.F. of Y	M.G.F. of $t_1$and t_2
6	If X and Y are discrete random variables, then its joint M.G.F. is given by	$\sum\sum e^{t_1x+\,t_2y}\, P(x,y$	$\int\int e^{t_1x+\,t_2y}\, f(x,y)\, d$	$\sum\sum e^{t_1x+\,t_2y}\, P(x,y)$	$\int\int e^{t_1x+\,t_2y}\, f(x,y)\, dx\, d$
7	If X and Y are continuous random variables, then its joint M.G.F. is given by	$\sum\sum e^{t_1x+\,t_2y}\, P(x,y$	$\int\int e^{t_1x+\,t_2y}\, f(x,y)\, d$	$\sum\sum e^{t_1x+\,t_2y}\, P(x,y)$	$\int\int e^{t_1x+\,t_2y}\, f(x,y)\, dx\, d$
8	$M(t_1,0)$ represents	M.G.F. of X and Y	M.G.F. of X	M.G.F. of Y	M.G.F. of t_1
9	$M(0,t_2)$ represents	M.G.F. of X and Y	M.G.F. of X	M.G.F. of Y	M.G.F. of t_2
10	The necessary and sufficient condition for the variables X and Y to be independent is	$M(t_1,t_2) = M(t_1,0) \times M(0,t_2)$	$M(t_1,t_2) = M(t_1,0) - M(0,t_2)$	$M(t_1,t_2) = M(t_1,0) + M(0,t_2)$	$M(t_1,t_2) = M(t_1,0) \div M(0,t_2)$
11	Trinomial distribution is an extension of	Poisson Distribution	Exponential Distribution	Binomial Distribution	Multinomial Distribution
12	Multinomial distribution is an extension of	Binomial Distribution	Normal Distribution	Poisson Distribution	Exponential Distribution
13	Trinomial distribution is	Discrete Distribution	Continuous Distribution	Random Distribution	Discrete continuous Distribution
14	If X and Y jointly follows Trinomial distribution then only X follows	$X \sim B(p_2,p_1)$	$X \sim B(q_1,p_1)$	$X \sim B(n,p_2)$	$X \sim B(n,p_1)$
15	If X and Y jointly follows Trinomial distribution then only Y follows	$Y \sim B(p_2,p_1)$	$Y \sim B(q_1,p_1)$	$Y \sim B(n,p_2)$	$Y \sim B(n,p_1)$
16	If	np_1	np_1q_1	np_2	np_1q_2

	$(X,Y)\sim Trinomial then\ E(X) is\ given\ by$				
17	If $(X,Y)\sim Trinomial then\ E(X) is\ given\ by$	np_1	np_1q_1	np_2	np_1q_2
18	For Trinomial distribution	$p_1+p_2=1$	$p_1+p_3=1$	$p_1+p_2+p_3=1$	$p_2+p_3=1$
19	For Trinomial distribution, the correlation coefficient is	$\rho=-\sqrt{\frac{p_1q_2}{q_1p_2}}$	$\rho=-\sqrt{\frac{q_1q_2}{p_1p_2}}$	$\rho=-\sqrt{\frac{q_1p_2}{p_1q_2}}$	$\rho=-\sqrt{\frac{p_1p_2}{q_1q_2}}$
20	$M(t_1,t_2)$ represents joint M.G.F. of X and Y then $E(X^2)=$	$\left[\frac{d^2}{dt_1^2}M(t_1,t_2)\right]$ at $t_1=0$	$\left[\frac{d^2}{dt_1^2}M(t_1,0)\right]$ at $t_1=0$	$\left[\frac{d^2}{dt_2^2}M(0,t_2)\right]$ at $t_2=0$	$\left[\frac{d^2}{dt_2^2}M(t_1,t_2)\right]$ at $t_2=0$
21	$M(t_1,t_2)$ represents joint M.G.F. of X and Y then $E(Y)=$	$\left[\frac{d}{dt_2}M(t_1,t_2)\right]$ at $t_2=0$	$\left[\frac{d}{dt_2}M(t_1,0)\right]$ at $t_2=0$	$\left[\frac{d}{dt_1}M(t_1,t_2)\right]$ at $t_1=0$	$\left[\frac{d}{dt_2}M(0,t_2)\right]$ at $t_2=0$
22	$M(t_1,t_2)$ represents joint M.G.F. of X and Y then $E(XY)=$	$\left[\frac{d}{dt_1}\frac{d}{dt_2}M(t_1,t_2)\right]$ at $t_1=0,t_2=0$	$\left[\frac{d}{dt_2}M(t_1,0)\right]$ at $t_2=0$	$\left[\frac{d}{dt_1}\frac{d}{dt_2}M(t_1,t_2)\right]$ at $t_1=0$	$\left[\frac{d}{dt_1}\frac{d}{dt_2}M(0,t_2)\right]$ at $t_2=0$
23	$M(t_1,t_2)$ represents joint M.G.F. of X and Y then $E(X^2Y)=$	$\left[\frac{d^2}{dt_1{}^2}\frac{d}{dt_2}M(t_1,t_2)\right]$ at $t_1=0,t_2=0$	$\left[\frac{d^2}{dt_1{}^2}\frac{d}{dt_2}M(t_1,0)\right]$ at $t_2=0$	$\left[\frac{d}{dt_1}\frac{d}{dt_2}M(t_1,t_2)\right]$ at $t_1=0$	$\left[\frac{d^2}{dt_1{}^2}\frac{d}{dt_2}M(0,t_2)\right]$ at $t_2=0$
24	$M(t_1,t_2)$ represents joint M.G.F. of X and Y then $E(XY^2)=$	$\left[\frac{d^2}{dt_1{}^2}\frac{d}{dt_2}M(t_1,t_2)\right]$ at $t_1=0,t_2=0$	$\left[\frac{d^2}{dt_1{}^2}\frac{d}{dt_2}M(t_1,0)\right]$ at $t_2=0$	$\left[\frac{d}{dt_1}\frac{d}{dt_2}M(0,t_2)\right]$ at $t_1=0$	$\left[\frac{d}{dt_1}\frac{d^2}{dt_2{}^2}M(t_1,t_2)\right]$ at $t_1=0,t_2=0$
25	$M(t_1,t_2)$ represents joint M.G.F. of X and Y then $E(X^mY^n)=$	$\left[\frac{d^m}{dt_1{}^m}\frac{d}{dt_2}M(t_1,t_2)\right]$ at $t_1=0,t_2=0$	$\left[\frac{d^n}{dt_1{}^n}\frac{d}{dt_2}M(t_1,0)\right]$ at $t_2=0$	$\left[\frac{d}{dt_1}\frac{d}{dt_2}M(0,t_2)\right]$ at $t_1=0$	$\left[\frac{d^m}{dt_1{}^m}\frac{d^n}{dt_2{}^n}M(t_1,t_2)\right]$ at $t_1=0,t_2=0$

SR. No.	QUESTION TEXT	OPTION 1	OPTION 2	OPTION 3	OPTION 4
1	In order statistics, if $X_1,X_2,\ldots\ldots,X_5$ denote a random sample of size 5, then $x_{(1)}$ is called as	Order statistics	First order statistics	Last order statistics	Largest order statistics
2	In order statistics, if $X_1,X_2,\ldots\ldots,X_7$ denote a random sample of size 7, then $x_{(7)}$ is called as	Order Statistics	First order statistics	Smallest order statistics	Largest order statistics
3	In order statistics, if $X_1,X_2,\ldots\ldots,X_{10}$ denote a random sample of size 10, then $x_{(1)}$ is called as	Order statistics	First order statistics	Last order statistics	Largest order statistics

4	In order statistics, if $X_1, X_2, \ldots\ldots, X_{20}$ denote a random sample of size 20, then $x_{(20)}$ is called as	Order Statistics	First order statistics	Smallest order statistics	Largest order statistics
5	In order statistics, if $X_1, X_2, \ldots\ldots, X_n$ denote a random sample of size n, then their order statistics are arranged as per their	Occurrence	Sequence	Magnitude	Sample size
6	Order statistics is applicable only for	Continuous distribution	Discrete distribution	Random distribution	Probability distribution
7	When the range of variable depends on the parameter, then we introduce	Order statistics	Probability	M.G.F	C.G.F
8	In order statistics, ordered variables are	Independent	Dependent	Random	Decreasing
9	If $y_1, y_2, \ldots\ldots, y_n$ represents order statistics, then the joint pdf of all 'n' order statistics is given by	$n! \prod_{i=1}^{n} f(y_i)$	$\prod_{i=1}^{n} f(y_i)$	$n! \prod_{i=1}^{n} f(x_i)$	$\prod_{i=1}^{n} f(x_i)$
10	If $y_1, y_2, \ldots\ldots, y_n$ represents order statistics, then the range is defined as	$R = y_2 - y_1$	$R = y_1 - y_2$	$R = y_n - y_1$	$R = y_1 - y_n$
11	If $y_1, y_2, \ldots\ldots, y_{15}$ represents order statistics, then the range is defined as	$R = y_2 - y_1$	$R = y_1 - y_2$	$R = y_{15} - y_1$	$R = y_1 - y_{10}$
12	If $X \sim U(a, b)$, then distribution function F(X) is	$\frac{1}{b-a}$	$\frac{x-a}{b-a}$	$\frac{x-b}{b-a}$	$\frac{x-a-b}{b-a}$
13	If $X \sim U(0, \theta)$, then distribution function F(X) is	$\frac{1}{\theta}$	$\frac{x-a}{2\theta}$	$\frac{x}{\theta}$	$\frac{x-\theta}{2\theta}$
14	If $X \sim U(0,1)$, then distribution function F(X) is	x	$\frac{1}{x}$	x^2	$\frac{1}{x^2}$
15	If $f(u, v)$ represents joint pdf of u and v, then marginal pdf of u can be obtained	Integrating $f(u, v)$w.r.t u	Differentiating $f(u, v)$w.r.t. v	Integrating$f(u, v)$w.r.t. v	Differentiating $f(u, v)$w.r.t. u
16	If $X \sim \exp(parameter = \theta)$, then distribution function F(X) is given by	$\theta e^{-\theta x}$	$1 - \theta e^{-\theta x}$	$e^{-\theta x}$	$1 - e^{-\theta x}$
17	When sample size n is odd, median is the observation at________ position.	$\left(\frac{n}{2}\right)^{th}$	$\left(\frac{n+2}{2}\right)^{th}$	$\left(\frac{n+1}{2}\right)^{th}$	$\left(\frac{n-1}{2}\right)^{th}$
18	When sample size n is even, median is the observation at________ position.	$\left(\frac{n}{2}\right)^{th}$	$\left(\frac{n+2}{2}\right)^{th}$	$\left(\frac{n+1}{2}\right)^{th}$	$\left(\frac{n-1}{2}\right)^{th}$
19	Random variables U and V are said to be independent if and only if	$f(u, v) = f(u + v)$	$f(u, v) = f(u - v)$	$f(u, v) = f(u) \times f(v)$	$f(u, v) = f(u) + f(v)$
20	Let $y_1, y_2, \ldots\ldots, y_9$ represents order statistics, the marginal pdf of y_2 (r < s) can be obtained using	p.d.f. of r^{th} order statistics	p.d.f. of r^{th} and s^{th} order statistics	p.d.f. of range	p.d.f. of median

21	Let $y_1, y_2, \dots\dots, y_{15}$ represents order statistics, the joint pdf of y_5 and y_{10} (r < s) can be obtained using	p.d.f. of range	p.d.f. of r^{th} order statistics	p.d.f. of median	p.d.f. of r^{th} and s^{th} order statistics
22	If $X \sim U(0,1)$, then r^{th} order statistics follows	Beta distribution of type I	Normal distribution	Beta distribution of type II	Gamma Distribution

<u>Question Bank</u>

<u>Sem V (ATKT)</u>

<u>Paper II (Code – USST502)</u>

	Unit 1				
Sr. No.	Question	Option A	Option B	Option C	Option D
1.	Any observable function of a random variable which does not contain any unknown parameter is known as	Population	Statistic	Parameter	Sample
2.	Value taken by an estimator on the basis of selected sample is known as	Statistic	Sample	Estimate	Parameter
3.	If T is an unbiased estimator of θ, then	$E(T) = \theta$	$E(T) = 0$	$E(T) - \theta = 1$	$E(\theta) = T$
4.	If $X \to U(0,\theta)$, then an unbiased estimator of θ is	$\bar{x}$	$2x$	$2\bar{x}$	x

5.	An estimator is consistent if its bias and variance both tends to zero as the sample size tends to	0	1	-1	∞
6.	If $X \sim N(\theta, 1)$, then which of the following is consistent but not unbiased?	$x+2$	$\bar{x}+\frac{1}{n}$	$x+\frac{1}{n}$	$2x$
7.	Cramer-Rao inequality is valid even if we deal with ________ distribution.	Discrete	Probability	Unbiased	Consistent
8.	If $X \sim P(\lambda)$, then Cramer-Rao lower bound for λ is	λ^2	λ	$\frac{\lambda}{n}$	$\frac{n}{\lambda}$
9	A random variable X follows exponential distribution with mean θ. Based on a random sample of size *n*, MVUE of θ is	$2\bar{x}$	$\bar{x}$	$\bar{x}+1$	$2\bar{x}+1$
10	_________ equality gives lower bound for the variance of unbiased estimator.	Cramer-Rao	Fisher	Neyman	Pearson
11	Neyman's factorization theorem is related to	Unbiasedness	Consistency	Sufficiency	Efficiency
12	Which of the following is not the property of a good estimator?	Unbiasedness	Effectiveness	Sufficiency	Efficiency
13	If T is biased for θ, then the bias is given by	$E(T)-\theta$	$E(T)=\theta$	$E(T)=\theta+1$	$E(\theta)-T$
14	If $X \sim P(\lambda)$, then $E(\bar{x}) =$ ____	$\lambda-1$	λ^2	λ	1-λ

15	If $X \sim N(\mu, 1)$, then _____ is an unbiased estimator of μ.	X^2	$2X$	$2X + 1$	X
16	If $X \sim N(\theta, 1)$, then which of the following is unbiased but not consistent estimator of θ?	$2X$	X	X^2	$2X + 1$
17	If X follows exponential distribution with parameter θ, then sufficient estimator of θ is ______.	$2\sum x_i$	$3\sum x_i^3$	$\sum x_i$	$\bar{x} + 1$
18	If MVUE exists, it is always	Consistent	Zero	Unity	Unique
19	If MVUE exists, then the necessary and sufficient condition for its existence is	$\frac{\partial \log L}{\partial \theta} = \frac{T - \theta}{K(\theta)}$	$\frac{\partial^2 \log L}{\partial \theta^2} = \frac{T - \theta}{K(\theta)}$	$\frac{\partial \log L}{\partial \theta} = \frac{T - \theta}{K^2(\theta)}$	$\frac{\partial^2 \log L}{\partial \theta^2} = \frac{T - \theta}{K^2(\theta)}$
20	If X follows exponential distribution with mean θ, then consistent estimator of θ is	$\bar{x}$	$\frac{1}{\bar{x}}$	$\frac{1}{2}\bar{x}$	$\frac{1}{n}\bar{x}$
21	If $X \sim N(\theta, 1)$, then which of the following is neither unbiased nor consistent estimator of θ?	x	$x - \frac{1}{n}$	$x + \frac{1}{n}$	$\frac{x}{n}$
22	If $X \sim P(2\lambda)$, then $E(\bar{x}) =$ ____	λ	2λ	$\lambda - 1$	$\lambda + 1$
23	If $X \sim Bin(n, p)$, then X is an unbiased estimator of	npq	np^2	$n(n-1)p$	np
24	__________ is a large sample property.	Consistency	Sufficiency	Efficiency	Unbiasedness

25	In which of the following case, T_2 is said to be more efficient than T_1?	$V(T_2) > V(T_1)$	$V(T_2) < V(T_1)$	$V(T_2) = V(T_1)$	$V(T_2) \geq V(T_1)$
26	If X~N(θ,1) then which is consistent but not unbiased	$\bar{x} + \frac{1}{n}$	$\bar{x}$	$2\bar{x} + 1$	$\bar{x} + 1$
27	If X~N(0, σ^2) then sufficient estimator of σ^2 is:	$\bar{x}$	$2\bar{x}$	$\sum x_i^2$	$\sum x_i^2 + 1$
28	__________ is a large sample property.	Consistency	Sufficiency	Efficiency	Unbiasedness
29	If $X \sim P(\lambda)$, then Cramer-Rao lower bound for λ is	λ^2	λ	$\frac{\lambda}{n}$	$\frac{n}{\lambda}$
30	Estimation is of two types	One sided and two sided	Type I and Type II	Point estimation and Interval Estimation	Biased and unbiased.
31	Neyman's factorization theorem is related to	Unbiasedness	Consistency	Sufficiency	Efficiency
32	If T is biased for θ, then the bias is given by	$E(T) - \theta$	$E(T) = \theta$	$E(T) = \theta + 1$	$E(\theta) - T$
33	Statistic defines characteristics of	Sample	Population	Parameter	Interval
34	Any observable function of a random variable which does not contain any unknown parameter is known as	Population	Statistic	Parameter	Sample
35	An estimator T_n based on a sample of size n is considered to be the best estimator of θ if:	$P\{\|T_n - \theta\| < \varepsilon\} \geq P\{\|T_n^* - \theta\| < \varepsilon\}$	$P\{\|T_n - \theta\| > \varepsilon\} \geq P\{\|T_n^* - \theta\| > \varepsilon\}$	$P\{\|T_n - \theta\| < \varepsilon\} = P\{\|T_n^* - \theta\| < \varepsilon\}$	none of the above

36	If $X_1, X_2, \ldots, X_n$ is a random sample from a population $N(0, \sigma^2)$, the sufficient statistic for σ^2 is:	ΣX_i	ΣX_i^2	$(\Sigma X_i)^2$	none of the above
37	If $X_1, X_2, \ldots, X_n$ be a random sample from an infinite population where $S^2 = \frac{1}{n}\sum_i (X_i - \bar{X})^2$, the unbiased estimator for the population variance σ^2 is:	$\frac{1}{n-1}S^2$	$\frac{1}{n}S^2$	$\frac{n-1}{n}S^2$	$\frac{n}{n-1}S^2$
38	If $X_1, X_2, \ldots, X_n$ is a random sample from an infinite population, an estimator for the population variance σ^2 such as:	$\frac{1}{n}\sum(X_i - \bar{X})^2$ is an unbiased estimator of σ^2	$\frac{1}{n}\sum(X_i - \bar{X})^2$ is a biased estimator of σ^2	$\sum(X_i - \bar{X})^2$ is an unbiased estimator of σ^2	none of the above
39	The lower bound for the variance of an estimator T_n under amended regularity conditions of Crammer-Rao was given by:	R.A. Fisher	A. Bhattacharyya	Silverstone	all the above
40	If $x_1, x_2, \ldots, x_n$ be a random sample from a $N(\mu, \sigma^2)$ population, the sufficient statistic for μ is:	$\Sigma(x_i - \bar{x})$	$\bar{x}/n$	Σx_i	$\Sigma(x_i - \bar{x})^2$
41	If the sample mean $\bar{x}$ is an estimate of population mean μ, then $\bar{x}$ is:	unbiased and efficient	unbiased and inefficient	biased and efficient	biased and inefficient
42	For the distribution, $f(x;\theta) = \frac{1}{\theta}; 0 \le x \le \theta$ a sufficient estimator for θ, based on a sample $X_1, X_2, \ldots, X_n$ is,	$\Sigma X_i / n$	$\sqrt{\Sigma X_i^2}$	$\max(X_1, X_2, \ldots, X_n)$	$\min(X_1, X_2, \ldots, X_n)$
	Unit 2				
1	If X follows exponential distribution with parameter θ, then MLE of θ is	$\bar{x}$	$\frac{1}{\bar{x}}$	$\frac{n}{\bar{x}}$	$2\bar{x}$

2	Given $f(x) = \lambda(1-\lambda)^x; \quad x = 0,1,2,\ldots.$ $= 0 \quad ; \quad otherwise$ MLE of λ is	$\frac{1}{x+1}$	$x+1$	$\frac{1}{\bar{x}+1}$	$\bar{x}+1$
3	MLE may not be	Efficient	Consistent	Maximum	Minimum
4	If $X \sim N(\mu, \sigma^2)$, σ^2 is known, then MLE of μ is	$\bar{x}$	$\bar{x}+1$	$2\bar{x}$	$x+1$
5	If $X \sim P(\theta)$, then MLE of θ is	$2\bar{x}$	$\bar{x}$	$\frac{1}{2}\bar{x}$	$\bar{x}^2$
6	MLE may or may not be	Zero	Unity	Unique	Variance
7	If X follows exponential distribution with parameter θ, then estimate of θ using method of moments is ______.	$\frac{1}{\bar{x}}$	$\bar{x}$	$2\bar{x}$	$3\bar{x}$
8	If $X \sim P(2\lambda)$, then estimate of λ using method of moments is	$2\bar{x}$	$\frac{1}{2}\bar{x}$	$2\bar{x}+1$	$3\bar{x}$
9	Method of moments can be used to find	Regression estimate	Interval estimate	Point estimate	Ratio estimate
10	If MLE exists, then it is a function of	Efficient Statistic	Consistent Statistic	Sufficient Statistic	Unbiased Statistic
11	__________ is less efficient estimator than those obtained by MLE.	Method of chi-square	Method of moment	Consistency	Efficiency
12	MLE may not be _______.	Efficient	Maximum	MVUE	Minimum

13	If X follows exponential distribution with parameter θ, then MLE of θ is	$\bar{x}$	$\frac{1}{\bar{x}}$	$\frac{n}{\bar{x}}$	$2\bar{x}$
14	If MLE exists, then it is a function of____	Efficient Statistic	Consistent Statistic	Sufficient Statistic	Unbiased Statistic
15	Method of minimum Chi-square is suggested by	Karl Pearson	Neyman Pearson	Cramer-Rao	Fisher
16	If $X \sim N(\mu, \sigma^2)$, σ^2 is known, then MLE of μ is	$\bar{x}$	$\bar{x}+1$	$2\bar{x}$	$x+1$
17	If $X \sim P(2\lambda)$, then estimate of λ using method of moments is	$2\bar{x}$	$\frac{1}{2}\bar{x}$	$2\bar{x}+1$	$3\bar{x}$
18	If $X_1, X_2, \ldots, X_n$ is a random sample from the population having the density function, $f(x;\theta) = \frac{1}{\sqrt{2\pi\theta}} e^{-\frac{1}{2}\frac{x^2}{\theta}}$, then the maximum likelihood estimator for θ is:	$\sqrt{\Sigma X_i^2/n}$	$\Sigma X_i^2/n$	$\sqrt{\Sigma X_i^2/n}$	$\Sigma X_i^2/\sqrt{n}$
19	Minimum Chi-square estimators are:	Consistent	Asymptotically normal	efficient	All of the above
20	If $X_1, X_2, \ldots, X_n$ is a random sample from a population $\frac{1}{\theta\sqrt{2\pi}} e^{-x^2/2\theta^2}$, the maximum likelihood for θ is:	$\Sigma X_i/n$	$\Sigma X_i^2/n$	$\sqrt{\Sigma_i X_i^2}/n$	$\sqrt{\Sigma X_i^2/n}$

	Unit 3				
1	Estimation is of two types	One sided and two sided	Type I and Type II	Point estimation and Interval Estimation	Biased and unbiased.
2	If $X \sim P(\theta)$, then estimate of θ using method of moments is	$\bar{x}$	$2x$	x^2	$x+1$
3	Method of moments is less effective estimator than those obtained by	Consistency	Chi-square	MLE	Efficiency
4	Method of minimum Chi-square is suggested by	Karl Pearson	Neyman Pearson	Cramer-Rao	Fisher
5	In case of Absolute Error Loss Function, Baye's estimator is the ______ of the posterior distribution of θ.	Mean	Mode	Variance	Median
6	Bayes estimator of θ as a function of y sample is :	$E(y/\theta)$	$E(\theta y)$	$E(\theta/y)$	$E(\theta^2 y)$
7	The _________ that minimizes the risk is called Bayes decision function.	Decision function	Risk function	Prior function	Posterior function
8	_______ estimate gives measure of accuracy of the point estimate by providing an interval that contain possible values.	Ratio	Regression	Point	Interval
9	In Bayes estimation, the parameters are not totally ________	Unknown	Known	Biased	Unbiased

10	________ is defined as an error committed in estimating parameters.	Decision function	Loss function	Prior distribution	Posterior distribution
11	_______ is one based guessed of true value of parameter.	Point estimate	Statistic	Sample	Interval estimate
12	Interval estimate is determined in terms of	Sampling error	Error of estimation	Degrees of freedom	Confidence coefficient
13	If $k(\theta/y)$ is *p.d.f.* of θ after the observations of y, then $k(\theta/y)$ is called	Prior distribution	Posterior distribution	Mean of posterior distribution	Median of posterior distribution
14	The expected value of loss function is called _______.	Decision function	Posterior distribution	Sample function	Risk function
15	Prior distribution of θ is _____ to the observation.	Posterior	Prior	Sample	Risk
16	In case of SELF Baye's estimator is the ______ of the posterior distribution.	Sample	Parameter	Median	Mean
17	If $L[W(Y),\theta]= [W(Y) - \theta]^2$ then it is called :	AELF	Risk	Decision	SELF
18	A function whose distribution is independent of parameter is called:	Biased	Unbiased	Pivot	Decision
19	The end point of a confidence interval are called :	Confidence coefficient	Confidence limits	Error of estimation	Parameters

20	The ________ that minimizes the risk is called Bayes decision function.	Decision function	Risk function	Prior function	Posterior function
21	______ estimate gives measure of accuracy of the point estimate by providing an interval that contain possible values.	Ratio	Regression	Point	Interval
22	In case of Absolute Error Loss Function, Baye's estimator is the _____ of the posterior distribution of θ.	Mean	Mode	Variance	Median
23	Bayes estimator of θ as a function of y sample is	$E(y/\theta)$	$E(\theta y)$	$E(\theta/y)$	$E(\theta^2 y)$
24	In Bayes estimation, the parameters are not totally _______	Unknown	Known	Biased	Unbiased
25	Formula for obtaining 95% confidence limits for the mean μ of a normal population $N(\mu, \sigma^2)$ with known σ are:	$-1.96 \leq \frac{\bar{x}-\mu}{\sigma/\sqrt{n}} < 1.96$	$P\left(-Z_{\alpha/2} \leq \frac{\bar{x}-\mu}{\sigma/\sqrt{n}} \leq Z_{\alpha/2}\right) = 0.95$	$\bar{x} \mp 1.96 \frac{\sigma}{\sqrt{n}}$	All of the above
26	Formula for the confidence interval with $(1-\alpha)$ confidence coefficient for the variance of the normal distribution $N(\mu, \sigma^2)$, when μ is known, is given as:	$-1.96 \leq \frac{\bar{x}-\mu}{\sigma/\sqrt{n}} < 1.96$	$P\left[\frac{ns^2}{\chi^2_{\alpha/2}} \leq \sigma^2 \leq \frac{ns^2}{\chi^2_{1-\alpha/2}}\right] = 1-\alpha$	$P\left[\frac{ns^2}{\chi^2_{\alpha/2}} \leq \sigma^2 \leq \frac{ns^2}{\chi^2_{1-\alpha/2}}\right] = 1-\alpha$	None of the above
	Unit 4				

1	A general linear model can be expressed as	$Y = X\beta$	$Y = \beta + \in$	$Y = X + \in$	$Y = X\beta + \in$
2	For model $Y = X\beta + \in$, an unbiased estimator of β is	$X\beta$	$\hat{\beta}$	$\hat{\beta} + e$	$E(\beta)$
3	For a model $Y = X\beta + \in$, estimate of β using method of least squares is	$(X'X)(X'Y)^{-1}$	$X(X'Y)$	$(X'X)^{-1}(X'Y)$	$(X'X)Y$
4	In linear model $Y = X\beta + \in$, $V(\hat{\beta}) =$ ___	$(X'X)^{-1}\sigma^2$	$(X'X)\ \ \sigma^2$	σ^2	$(X'Y)^{-1}\sigma^2$
5	In linear model $Y = X\beta + \in$, $E(e) =$ __	1	0	-1	2
6	For estimating β, ESS is _______	Minimizes	Maximizes	Equated to zero	Equated to one
7	In a linear model Y=Xβ+ε	σ^2	σ	$2\sigma^2$	$\frac{1}{\sigma^2}$
8	For a model Y=Xβ+ε,rank of $X_{n\,X\,p}$ is:	nk	p	n	np
9	In a interval estimation the level of confidence is denoted by:	α	β	1-α	1-β
10	The end point of a confidence interval are called :	Confidence coefficient	Confidence limits	Error of estimation	Parameters
11	For model $Y = X\beta + \in$, an unbiased estimator of β is	$X\beta$	$\hat{\beta}$	$\hat{\beta} + e$	$E(\beta)$

12	In linear model $Y = X\beta + \in$, $E(e) =$ ___	1	0	-1	2
13	For estimating β, ESS is _______	Minimizes	Maximizes	Equated to zero	Equated to one

Question Bank

Sem V Paper III (ATKT) (Code - USST503)

Sr. No.	QUESTION	OPTION 1	OPTION 2	OPTION 3	OPTION 4
1	Contagious diseases are also called	Infectious diseases	Risky diseases	Harmful diseases	Contact diseases
2	The person carrying the infectious material is a	Susceptible	Diseased person	Infected person	Immune person
3	The period from receipt of infection and appearance of symptoms is	Infectious period	Incubation period	Serial interval	Incubation period
4	The period of internal development of a disease	Latent period	Infectious period	Incubation period	Serial interval

	without any emission of infectious material is				
5	The period of passing of infection from an infected person to a susceptible is called	Latent period	Infectious period	Incubation period	Serial interval
6	The period from observation of symptoms in one case to the observation of symptoms in second case directly infected from the first is called	Infectious period	Incubation period	Serial interval	Incubation period
7	Simple epidemic model applies to diseases which are	Seriously fatal	Not fatal	Fatal for adults	Fatal for children
8	The size of the population in the Simple epidemic model with 1 infective at the start is	$n+1$	n	$2n$	$n/2$
9	The size of the population in the Simple epidemic model with a infective at the start is	$n + 1$	$n + a$	n	a
10	In Simple epidemic model, with X and Y as the No. of susceptibles and infectives, the rate of new infection $w$is given by	$W = XY$	$W = X + Y$	$W = X/Y$	$W = dX/dY$
11	In Simple epidemic model, with X and Y as the No. of susceptibles and infectives, the graph of the rate of new infection w Vs time is	An increasing curve	An decreasing curve	A exponential curve	A symmetric curve
12	Individuals who spread the infection but do not show any symptoms of the disease are called	Susceptibles	hosts	Carriers	infectives

13	The epidemic model in which infectious period is very small and the infection spreads only among family members is called	Simple epidemic model	Carrier model	Chain Binomial model	General epidemic model
14	Green Wood model is an example of	General epidemic model	Chain Binomial model	Simple epidemic model	Carrier model
15	Reed Frost model is an example of	Carrier model	General epidemic model	Simple epidemic model	Chain Binomial model
16	Number of chains in a household of size 2 with single introduction is	1	2	3	4
17	Number of chains in a household of size 3 with single introduction is	2	3	4	1
18	Number of chains in a household of size 3 with double introduction is	2	1	3	5
19	Number of chains in a household of size 4 with single introduction is	8	4	6	3
20	Number of chains in a household of size 4 with double introduction is	2	3	1	4
21	Number of chains in a household of size 4 with triple introduction is	1	2	5	4
22	Reed Frost probability of chain is given by	$r_tCs_t\ (1 - q^{St})^{St}\ (q^{St})^{rt}$	$r_tCs_{t+1}\ (1 - q^{St})^{St+1}$	$r_tCs_{t+1}\ (1 - q^{St})^{St}\ (q^{St})^{rt+1}$	$r_tCs_{t+1}\ (1 - q^{St})^{St+1}\ (q^{St})^{rt}$

			$(q^{St})^{rt+1}$		
23	Green Wood probability of chain is given by	$r_{t+1}Cs_{t+1}\ p^{St+1}$ $q^{rt-st+1}$	$r_tCs_{t+1}\ p^{St}$ $q^{rt-st+1}$	$r_tCs_{t+1}\ p^{St}$ $q^{rt-st+1}$	$r_{t+1}Cs_{t+1}\ p^{St}$ q^{rt}
24	Clinical Trials are conducted on	Animals	Humans	Both humans and animals	Insects
25	Total number of phases of clinical trials is	One	Four	Three	Two
26	The first phase of Clinical trials is carried on	Healthy volunteers	Patients	Both Healthy persons and patients	Healthy animals
27	In the first phase of Clinical trials, drugs are tested for	Efficacy	Safety	Potency	All three
28	Full form of MTD is	Minimum Treatable dose	Minimum Tolerated Dose	Maximum Tolerated dose	Maximum Treatable dose
29	Technique of performing a given experiment in a controlled environment is called	In vivo	In vitro	In voice	In visage
30	Technique of performing a given experiment inside an organism is called	In vivo	In vitro	In voice	In visage
31	Highest dose of a drug that can be tolerated with an acceptable or manageable level of toxicity is called	Minimum Treatable dose	Minimum Tolerated Dose	Maximum Tolerated dose	Maximum Treatable dose
32	Pharmakinetics is study of	What drugs are safe for the body	What the body does to the drug	What the drug does to the body	What both body and drug do to each other
33	Pharmacodynamics is study of	What drugs are safe for the body	What the body does to the drug	What the drug does to the body	What both body and drug do to each other

34	A document that describes the objectives, design, methodology, statistical analysis and organization of a clinical trial is called	Periodical	Prognosis	Paper	Protocol
35	A document for collecting and recording patient information is called	Case record form	Case report form	Case recap form	Case return form
36	A pill indistinguishable from the active treatment but containing no active substance is	The perfect pill	The proper pill	The placebo pill	The chemical pill
37	Unblinded trial is also called	Open Label trial	Open window trial	Open door trial	Open access trial
38	A study in which a subject is randomly assigned to a treatment group and sticks with that treatment for the remainder of the trial is called	Cross over design	Random group design	Fixed group design	Parallel design
39	A study in which a subject receives a sequence of different treatments is called	Cross over design	Random group design	Fixed group design	Parallel design
40	Trials designed to demonstrate one treatment is more effective than another are called	Non Inferiority trials	Superiority trials	Equivalence trials	Non superiority trials
41	Trials designed to demonstrate one treatment is at least not appreciably worse than another are called	Non Inferiority trials	Superiority trials	Equivalence trials	Non superiority trials
42	Trials designed to demonstrate one treatment is as effective as another are called	Non Inferiority trials	Superiority trials	Equivalence trials	Non superiority trials

43	The medical and social standards determining whether a person may or may not be allowed to enter a clinical trial are called	In – Out criteria	Inclusion – Exclusion criteria	For – Against criteria	Pro – Anti Criteria
44	The comparison of a generic drug and a branded drug with respect to its strength and efficacy is called	Bioequivalence	Biosimilarity	Biosynthesis	Biochemistry
45	Body processes of Absorption, Distribution, Metabolism, Excretion are called as	Pharma dynamics	Pharmacokinetics	Pharmacy	Pharmalogy
46	AUC, AUC(0 - ∞), Cmax and Tmax are called	Pharmacokinetic parameters	Pharma dynamic parameters	Pharma parameters	Pharmacology parameters
47	Full form of AUC is	Area under the carrier	Area under the cage	Ares under the cup	Area under the curve
48	Elimination phase begins	At Cmax	Before *Cmax*	After *Cmax*	At *tmax*
49	AUC(0 - ∞) means	Presence of drug in system for a very long time	Absence of drug in system for a very long time	Presence of drug in system for a very short time	Absence of drug in system for for a very short time
50	For calculation of *Kel*, the number of concentration values must be	Three or less	At least three non zero	Two or more	At least one
51	Bioavailability studies are often conducted with	Healthy as well as unhealthy volunteers	Non human volunteers	patients	Healthy volunteers
52	The two formulations compared in bioequivalence are	Test and Reference	Test and Refereed	Total and referred	Test and readied

53	For drugs having long half life, design recommended is	Cross Over design	Parallel design	Two way design	Three way design
54	Parallel design is recommended for	Special drugs	drugs having long half life	For drugs having short life	Standard drugs
55	The extent of a drug that reaches the systemic circulation and is available at the site of action is called	Bioavailability	Biopresence	Bioaccess	Biocare
56	Retrospective studies employ	Odd's ratio	Relative risk	Related risk	Even Ratio
57	‘ Ethics' play an important role in	Laboratory experiments	Animal Experiments	Clinical trials	Study trials
58	Drug under study is compared with currently available standard treatments in	Phase III of clinical trials	Phase I of clinical trials	Phase II of clinical trials	Phase IV of clinical trials
59	Phase IV of the clinical trials is conducted	After marketing the drug	Before marketing the drug	At the time of marketing the drug	At the time of licencing
60	In Clinical trials, technique used to prevent bias is called	Covering	Hiding	Masking	Blinding
61	Bioassay is an experiment where estimates are based on	Reactions of a material or process after their application to living matter	Reactions of a material or process before their application to living matter	Readinessof a material or process after their application	Reaction of a material or process after their application to non living objects
62	If response is measurable, the assay is said to be	Qualitative	Quantitative	Quotable	Questionable
63	If response is observable, the assay is said to be	Qualitative	Quantitative	Quotable	Questionable
64	If response is fixed and the dose is variable, the bioassay is said to be	Delayed	Indirect	Depicted	Direct

65	If dose is fixed and the response is variable, the bioassay is said to be	Delayed	Indirect	Decided	Direct
66	In Bioassay, a substance or process applied to living matter is called	Subject	Stimulus	Dose	Response
67	In Bioassay, the living being to which stimulus is applied is called	Subject	Patient	Volunteer	Responder
68	In Bioassay, the size or quantity of the stimulus is called	Amount	Measure	Dose	Prescription
69	In Bioassay, the reaction to the stimulus is called	Answer	Reply	Response	Giveback
70	The preparation which is recognized universally with respect to its potency is called	Specific preparation	Special preparation	Test preparation	Standard preparation
71	The preparation compared with standard preparation is called	Test preparation	Check preparation	Result preparation	Response preparation
72	In usual notations, relative potency is given by	$P = \frac{z_s}{z_t}$	$P = \frac{z_t}{z_s}$	$P = \frac{2z_s}{z_t}$	$P = \frac{4z_s}{z_t}$
73	In Bioassay, the theorem used in estimating relative potency is	Fieller's Theorem	Legrange's theorem	Fischer's theorem	Pascal's theorem
74	If lines representing test and standard preparations are having same slope, we have	Double line Assay	Perfect line Assay	Parallel line Assay	Same slope Assay
75	If lines representing test and standard preparations are having same y - intercept, we have	Parallel line Assay	Slope Ratio Assay	Slope turn Assay	Perfect line Assay

76	In Indirect assays, the assumption of monotonicity means	*If Zs < Zt then* $f(Zs) < f(Z_t)$	*If Zs < Zt then* $f(Zs) > f(Z_t)$	*If Zs < Zt then* $f(Zs) = f(Z_t)$	*If Zs < Zt then* $f(Zs) / f(Z_t) = 1$
77	In Indirect assays, the assumption of similarity means	Doses are same	Responses are same	Subjects are same	Preparations are same
78	For parallel line Assay, Dose metameter is	$X = \log z^2$	$X = \log z/2$	$X = \log z^3$	$X = \log z/10$
79	For Slope Ratio Assay, Dose metameter is	$Xs = Zs^{\lambda+1}$	$Xs = Zs^{\lambda/2}$	$Xs = Zs^{\lambda-1}$	$Xs = Zs^{\lambda}$
80	If 2 doses produce the same response, they are said to be	Equal	Equivalent	Similar	Exact
81	In Simple epidemic model, Number of susceptibles at time is given by	$\frac{n(n+1)}{e^{(n+1)\tau}+n}$	$\frac{n(n+1)}{e^{(n+1)\tau}-n}$	$\frac{n(n-1)}{e^{(n+1)\tau}+n}$	$\frac{n(n+2)}{e^{(n+1)\tau}+n}$
82	In Simple epidemic model, Number of infectives at time is given by	$\frac{(n+1)e^{(n+1)\tau}}{e^{(n+1)\tau}+n}$	$\frac{(n)e^{(n+1)\tau}}{e^{(n+1)\tau}+n}$	$\frac{2(n+1)e^{(n+1)\tau}}{e^{(n+1)\tau}+n}$	$\frac{(n+1)e^{(n+1)\tau}}{e^{(n+1)\tau}-n}$

Question Bank

Sem V (ATKT)

Paper IV (Code – USST504A)

Sr. No.	Questions	Option 1	Option 2	Option 3	Option 4
1	_______ is a logical argument given while plotting bar diagram.	Beside	height	Xlab	main
2	Use _______ to explicitly covert the type of data.	is.variabletype()	as.variabletype()	is.character()	as.character()
3	The variable whose value is to be predicted or estimated from the known values of other variable is called_______.	Independent variable	Dependent variable	Explanatory variable	Input variable
4	A regression model or an regression equation is said to be linear it is linear in ______.	Parameter	Independent variable	Dependent variable	Input variable
5	How many independent variables does the simple linear regression model contain?	0	1	2	More than 2
6	The point where the regression line touches the Y-axis is called ________.	Slope	Regression point	Y-point	Intercept
7	______ tells us how much Y would increase, for every unit increase in X.	Intercept	Correlation	Slope	Estimator

8	_______ generate consecutive numbers.	Sequence operator	C function	Matrix function	Sort function
9	______ can have any number of dimensions.	C function	Array function	Sequence	Sequence Operator
10	For simple linear Regression model, $V(\widehat{\beta_1})$=_________.	S_{xy}	$\frac{\sigma^2}{s_{xx}}$	$\frac{\sigma^2}{S_{yy}}$	$\frac{S_{xy}}{S_{xx}}$
11	Which of the following is right assignment.	→	←	=	<<-
12	The function used to know the index of the element.	Which	What	Where	Why
13	The function used to obtain the variance of the data.	variance()	deviation()	Var()	Variability()
14	Identify the data type of the following example "TRUE" and "FALSE".	Numeric	Complex	Logical	Integer
15	Coefficient of determination is ______ function of number of regressor.	Non-decreasing	Non-increasing	Constant	Scatter
16	Cov($\underline{X}$) is always ______ matrix.	Asymmetric	Diagonal	Symmetric	Lower triangular
17	Which test is used for detection of autocorrelation.	Breusch-Pagan Godfrey test	Pairwise correlation	Durbin-Watson test	VIF
18	If correlation between two explanatory variables is very high (> 0.8) then _____ is present.	Homoscedasticity	Heteroscedasticity	Autocorrelation	Multicollinearity
19	A=$\begin{bmatrix} 3 & 2 & 5 \\ 7 & 4 & 2 \\ 7 & 3 & 9 \end{bmatrix}$ What is rank of this matrix.	3	2	1	0
20	If r= 0.7 and n=8 then calculate test statistics for Spearman's rank correlation.	1.83711	1.73711	0.83711	0.73711

21	If column vector of designed matrix is approximated linearly dependent then such matrix is called _____ matrix.	diagonal	ill	poor	bad
22	The residuals (error) follow _____ distribution.	Normal	Standard normal	Binomial	Poisson
23	For simple linear regression model $\hat{\sigma}^2$ =____	$\frac{SSE}{n-2}$	$\frac{SSE}{n-1}$	$\frac{SST}{n-1}$	$\frac{SST}{n-2}$
24	The fitted regression line always passes through	$(\bar{x}, \bar{y})$	(x_i, y_i)	origin	$(\sum x_i, \sum y_i)$
25	_______ function eliminates duplicate elements.	sort()	scan()	unique()	round()
26	R software environment for: (A) Statistical analysis (B) Graphics presentation	Only A	Only B	Both A and B	Neither A nor B
27	The command window appearing on starting R is called as ___________	Text editor	Console	Graphics	Environment/History
28	_____ allow you to save your program for later use	Console	Graphics	Text editors	Environment/History
29	If a command remains incomplete at the end of line R will show you a different symbol_____	{ }	#	[ ]	+
30	_____will search all sources of documentation and return those that match the search string	?help	?help.search	?help	help
31	Use the _____ function to load the packages stored in a library for use.	Packages()	library()	demo()	example()

32	______seeks to find linear combination of predictor that capture maximum possible variance.	scaling	imputing	principle component analysis	combining
33	Which of the following under data reduction? (A)Centering and scaling (B) Principle component analysis	Only A	Only B	Only A and B	Neither A nor B
34	In regression analysis the variable whose value is predicted is called as	Regressor	Independent variable	Response	Control
35	Which of the following is NOT true in case of simple linear regression model? (A) The error terms ε_i and ε_j are uncorrelated (B) Variance of error term is known	Only A	Only B	Both A and B	Neither A nor B
36	Ordinary least square estimators of the parameters are______ (A) Efficient (B) Unbiased	Only A	Only B	Both A and B	Neither A nor B
37	The method of removing tuple is used to deal with missing values when (A) Missingness is related to predictor (B) Data set is large enough	Only A	Only B	Both A and B	Neither A nor B

38	Which of the following is true in case of simple linear regression model? (A)The parameters of model are called as regression coefficients (B) The error component represents difference between true and observed value of Y	Only A	Only B	Both A and B	Neither A nor B
39	A linear regression model which involves more than one _____ variable is called as MLR model.	Dependent	Regressor	Response	Estimate
40	Following which model is MLR?	Y= $\beta_0+\beta_1 X+\varepsilon$	Y= $\beta_0+\beta_1 X+\beta_2 X^2+\varepsilon$	Y= $\beta_0+\beta_1 X_1+\beta_2 X_2+\varepsilon$	Y= $\beta_0+\varepsilon$
41	What is the value of the test statistics in MLR?	$\frac{MESS}{MRSS}$	$\frac{MESS}{MTSS}$	$\frac{MRSS}{MESS}$	$\frac{M\ Reg\ ss}{MTSS}$
42	If $H_0: \beta_1=\beta_2=\beta_3$ *which meant*	Regression coefficient are statistically significant	Regression coefficient are not statistically	At least one coefficient is statistically significant	Exactly two coefficient are not statistically significant
43	In Y= Xβ+ε , X is called.	Parameter matrix	Response matrix	Design matrix	Disturbance matrix
44	In MLR suppose 3 regression coefficient are used then what is degree of freedom for residual.	n-1	n-3	n-4	2
45	To check validity of the basic regression assumption we used_______ analysis.	Principle	Cluster	Residual	Canonical
46	Define Residual e_i=_____ (i=1,2,----,n)	$Y_i-\bar{Y}$	$\bar{Y}-\hat{Y}_i$	$Y_i-\bar{Y}_i$	$Y_i-\hat{Y}_i$

47	Which method is used for stating residuals	Studentised	Normal	Forward	Backward
48	Standardized residual (d_i) = ________ (i=1,2,----,n)	$\frac{e_i}{\sqrt{MRSS}}$	$\frac{e_i}{\sqrt{M\ Reg\ SS}}$	$\frac{e_i}{MRSS}$	$\frac{e_i}{M\ Reg\ SS}$
49	In studentised residuals e_i = ________ (Where H is hat matrix)	$I\underline{Y}$	$H\underline{Y}$	$(I-H)\underline{Y}$	$(I+H)\ \underline{Y}$
50	If value of ρ= 0.34569 then calculate Durbin-Watson test statistic	0.65431	0.426944	0.30862	1.30862
51	The ______ operator assigns value to a variable. (A) = (B) ≤	Only A	Only B	Both A and B	Neither A nor B
52	______ specifies whether matrix values are filled row wise or column wise.	n row	n col	by row	data
53	Select the correct syntax to get the output as 111222333	>rep(1:3, times=3)	>rep(1:3, each=3)	>rep(1:3, 3)	>rep(1,3, each=3)
54	The command given to displays observations except 3^{rd} and 4^{th} values in vector X. (i) >X[C(3,4)] (ii) >X[C(-3, -4)]	Only (i)	Only (ii)	Both (i) and (ii)	Neither (i) nor (ii)
55	Select the appropriate function used for multiplication of two matrices A and B.	A*B	A% B	A%*%B	A$B
56	A ______ is a special type of object that can contain multiple types of data.	Matrix	List	Vector	Data frame
57	A vector of levels is called a ______.	Factor	Array	List	Data frame

58	The most efficient base to identify outliers maybe	Scatter plot	polygon	Multiple bar diagram	Frequency curve
59	In data pre-processing instead of removing outlier an alternative way is to ______ the data.	Reduce	Transform	Clean	Combining
60	Regression analysis is statistical technique for ______ the relationship between two or more variable.	Modelling	Identifying	Predicting	Estimating
61	The variable used for prediction is called as _____.	Response variable	Dependent variable	Independent variable	Outcome variable
62	Linear Regression Model with____ is called as simple linear regression model.	One explanatory variable	More than one explanatory variable	More than one regressor	One parameter
63	Random error ε_i's are normally distributed random variables with parameters_____.	(0, 1)	(μ, σ^2)	(0, σ^2)	(μ,0)
64	The ordinary least square estimators of (β_0, β_1) are the _____ combinations of Y.	Linear	Non-linear	Quadratic	Parabolic
65	$\sum_{i=1}^{n} (Y_i - \widehat{Y_i})^2$=______	Regression SS	Block SS	Total SS	Error SS
66	What is coefficient of determination in MLR?	$\frac{TSS}{ESS}$	$\frac{ESS}{TSS}$	$\frac{Reg\ SS}{TSS}$	$\frac{TSS}{Reg\ SS}$
67	If E($\underline{X}$) =$\mu_{P\ X\ 1}$ and cov($\underline{X}$)=$\Sigma_{P\ X\ P}$ then cov(A$\underline{X}$)=______	A'ΣA	$A'\Sigma^{-1}A$	$A\Sigma^{-1}A'$	AΣA'

68	If E(u_i)=0 and V(u_i) $= \sigma^2$ (for all i=1,2,-----,n) then there is_____ between all $u_i{}'s$	Autocorrelation	No autocorrelation	Multicollinearity	No Multicollinearity
69	_____ is an unbiased estimator of σ^2	Residual	Regressor	Mean square of residual	Mean square of regressor
70	If Residual SS = 349.51 and TSS = 1078.67 then calculate coefficient of determination.	0.3240	0.6759	0.4240	0.4759
71	If H is hat matrix then (I-H) is _______	Only idempotent	Only symmetric	Idempotent and symmetric	Neither idempotent nor symmetric
72	Correlation between member of series of observation ordered in time is called_____	Partial correlation	Autocorrelation	Homoscedasticity	Multicollinearity
73	What is the value of disturbance term (U_t) in 1st order autoregressive scheme	$Y_t = \rho V_{t-1} + U_t$	$U_{t+1} = U_t - V_t$	$V_{t+1} = V_t - U_t$	$U_t = \rho U_{t-1} + V_t$
74	If variance (Y/X) is not same for all explanatory variable then it is called _____.	Homoscedasticity	Heteroscedasticity	Autocorrelation	Multicollinearity
75	If heteroscedasticity is present, which estimator we used?	GLS	OLS	WLS	Unbiased