LHR-21

Roll No _____ (To be filled in by the candidate)

(Academic Sessions 2017 – 2019 to 2019 – 2021)

STATISTICS 221-(INTER PART – II) Time Allowed : 20 Minutes

Q. PAPER – II (Objective Type) **PAPER CODE = 8183** Maximum Marks : 17

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	In sampling with replacement, the sampling units can be selected :			
	(A) Only once	(B) More than once	(C) Less than once	(D) None
2	Which of the following " CAN NOT" be Ho :			
	(A) $\theta \leq \theta_o$	(B) $\theta \geq \theta_o$	(C) $\theta \neq \theta_o$	(D) $\theta = \theta_o$
3	For 2×2 contingency table, d.f. = ----- :			
	(A) $(r-1)(c-1)$	(B) $(r-1)+(c-1)$	(C) $(r-1)-(c-1)$	(D) $rc-1$
4	The sequence which follows irregular or random pattern of variations is called :			
	(A) Signal	(B) Model	(C) Noise	(D) Trend
5	Normal distribution has maximum ordinate at X = ---- :			
	(A) μ	(B) σ	(C) 1	(D) 0
6	When two variables are uncorrelated, then the value of " r " will be :			
	(A) Zero	(B) +1	(C) – 1	(D) 0.5
7	In standard normal distribution, mean and variance respectively are :			
	(A) 0 and 3	(B) 0 and 1	(C) 0 and 5	(D) 0 and 2
8	If $\hat{y} = 2 + 0.6X$, then the value of slope is :			
	(A) 2	(B) 0.30	(C) 1.2	(D) 0.6
9	Graph of time series is called :			
	(A) Histogram	(B) Historigram	(C) Scatter diagram	(D) Ogive
10	If level of significance is 0.05, then level of confidence will be :			
	(A) 0.95	(B) 0.90	(C) 0.99	(D) 0.095
11	In normal distribution $P(-\infty < X < +\infty)$ is equal to :			
	(A) – 1	(B) 0	(C) 1	(D) 0.5
12	The formula or function used to estimate a parameter is called :			
	(A) Estimate	(B) Estimation	(C) Predictor	(D) Estimator
13	$\Sigma \bar{x}\, p(\bar{x})$ is equal to :			
	(A) $\bar{x}$	(B) $\mu_{\bar{x}}$	(C) μ^2	(D) N
14	Accepting Ho, when Ho is false, is :			
	(A) No error	(B) Type I error	(C) Type II error	(D) α
15	A population about which some information is desired is called :			
	(A) Sampled population	(B) Hypothetical population		
	(C) Target population	(D) Infinite population		
16	In regression, $\Sigma \hat{y}$ is equal to :			
	(A) 0	(B) Σy	(C) a	(D) b_{yx}
17	The limit of rank correlation coefficient is :			
	(A) – 1 and 0	(B) 0 and +1	(C) – 1 and +1	(D) $-\infty$ and $+\infty$

LHR-21

Roll No _____ (To be filled in by the candidate) **(Academic Sessions 2017 – 2019 to 2019 – 2021)**

STATISTICS 221-(INTER PART – II) Time Allowed : 2.40 hours

PAPER – II (Essay Type) Maximum Marks : 68

SECTION – I

2. Write short answers to any EIGHT (8) questions : **16**

(i) What is standard normal distribution?

(ii) Write any two properties of normal distribution.

(iii) In a normal distribution, if $\mu = 20$ and $\sigma = 5$, find Q.D.

(iv) Why β_1 is zero in normal distribution?

(v) Define points of inflection in normal distribution.

(vi) In a normal distribution, $\mu_2 = 9$, find μ_3 and μ_4.

(vii) Define unbiased estimator.

(viii) What is best estimator?

(ix) Define interval estimate.

(x) Define statistical hypothesis.

(xi) Define power of a test.

(xii) Define level of significance.

3. Write short answers to any EIGHT (8) questions : **16**

(i) Define sampling.

(ii) Define non-probability sampling.

(iii) If $\sigma = 5$, $N = 3$, $n = 8$, find $\sigma_{\bar{x}}^2$ if sampling is done with replacement.

(iv) Define sampling frame.

(v) Write down any two advantages of sampling.

(vi) A population consists of 2, 4, 6, 8, 9. How many possible samples of size 3 can be drawn without replacement?

(vii) Define scatter diagram.

(viii) What are the parameters of simple linear regression model?

(ix) Given $\hat{y} = 0.72 + 1.33x$, $\Sigma y = 16.9$ and $x = 0, 1, 2, 3, 4$ then show that $\Sigma y = \Sigma \hat{y}$.

(x) What is the range of correlation coefficient?

(xi) What is the relationship between regression coefficients and correlation coefficient?

(xii) If $r = 0.48$, $S_{xy} = 36$ and $S_x^2 = 16$, find the value of S_x.

4. Write short answers to any SIX (6) questions : **12**

(i) Define attributes.

(ii) Define class and class frequency.

(iii) What is ultimate class frequency?

(iv) If $n = 600$, $(A) = 240$; $(B) = 270$, find (AB)

(v) What is time series?

(vi) Describe the seasonal variation.

(vii) Discuss historigram.

(viii) Explain the term secular trend.

(ix) Discuss term noise.

(Turn Over)

SECTION – II

Note : Attempt any THREE questions.

5. (a) In a normal distribution the mean is 20 and S.D = 5, find :
(i) $P(X \geq 8)$ (ii) $P(X < 24)$ 4

(b) In normal distribution mean = 16 and variance = 25 , find :
(i) $P(11 < X < 21)$ (ii) $P(X > 26)$ 4

6. (a) A population consists of values 3, 6 and 9. Take all possible samples of size 3 with replacement . Form sampling distribution of mean. Verify the results : 4

(i) $\mu_{\bar{x}} = \mu$ (ii) $\sigma_{\bar{x}}^2 = \frac{\sigma^2}{n}$

(b) A finite population consists of three values 2, 4, 6. Take all possible sample of size 2 with replacement. Form the sampling distribution of sample variance and verify that : 4

$$\mu_{S^2} = \frac{n-1}{n}\sigma^2$$

$$S^2 = \frac{\Sigma(X-\bar{X})^2}{n}$$

7. (a) Find a 90% confidence interval for the mean of a normal distribution if $\sigma = 2$ and a sample of size 8 gave the values 9, 14, 10, 12, 7, 13, 11, 12 4

(b) Let $X \sim N(\mu, 100)$ and $\bar{X}$ be the mean of a random sample of 64 observations of X, given that $\bar{X} = 15$ test $H_0 : \mu = 12$ against $H_1 : \mu > 12$ use $\alpha = .05$ 4

8. (a) For the following data : 4

X	6	8	10	12	14
Y	102	106	110	113	120

Find the mean values $\bar{X}$ and $\bar{Y}$ and using these values find the equation of the regression line Y on X in the form $Y - \bar{Y} = b(X - \bar{X})$

(b) Compute the coefficient of correlation for a sample of 20 pairs of observations 4
Given that : $\bar{X} = 2$, $\bar{Y} = 8$, $\Sigma X^2 = 180$, $\Sigma Y^2 = 1424$ and $\Sigma XY = 404$

9. (a) Find the association between injection against typhoid and exemption from attack from the following contingency table : 4

Attribute	Attacked	Not attacked
Inoculated	528	25
Not inoculated	790	175

(b) Calculate 7 days moving average for the following records of attendance : 4

Days	Weeks	
	I	II
Sun	24	27
Mon	55	52
Tue	29	32
Wed	48	43
Thur	52	53
Fri	55	53
Sat	61	65