University of Mumbai

Examinations Summer 2022

Time: 2 hour 30 minutes

Max. Marks: 80

Q1 (20	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks					
Marks)	compuisory and carry equal marks					
1.	Inspectors for a hospital chain with multiple locations randomly select some of their					
Ontion A:	locations for a cleanliness check of their operating rooms.					
Option A:	Cluster sampling Stratified Sampling					
Option B: Option C:	Stratified Sampling					
	Quota Sampling					
Option D:	Snowball Sampling					
2.	In MLR, the square of the multiple correlation coefficient or R^2 is called the					
Option A:	Coefficient of determination					
_	Variance Variance					
Option B:	Covariance					
Option C:						
Option D:	Cross-product					
3.	The med of the office sixed of 7 consorting days 11 12 12 17 10 22 25 is					
	The mode of the calls received on 7 consecutive days 11,13,13,17,19,23,25 is					
Option A:						
Option B:						
Option C:						
Option D:						
4.	"More than type Ogive" and "less than type Ogive" for a distribution intersect at					
Option A:	Mean					
Option B:	Median					
Option C:	Mode					
Option D:	Origin					
523						
55,5° 50's	In method, the upper limit of one class is the lower limit of the next					
2223	class.					
Option A:	Inclusive					
Option B:	Exclusive					
Option C:	Inter S S S S S S S S S S S S S S S S S S S					
Option D:	Intra					
V 53339						
6.88	If the regression coefficients are $b_{yx} = 0.5$ and $b_{xy} = 0.46$, then the value of coefficient					
2400143	of correlation (r) is					
Option A:	0.39					
Option B:	0.48					
Option C:	0.23					
Option D:	0.25					
J. 83 65 65 (6)						
	In regression analysis, if the independent variable is measured in Kilometers, the					
1282	dependent variable					
Option A:	Must also be in Kilometers					
Option B:	Must be in some unit of Distance					
Option C:	Cannot be in Kilometers					

Option D:	Can be any units			
8.	A linear regression (LR) analysis produces the equation $Y = 0.4X + 3$. This indicates			
	that:			
Option A:	When $Y = 0.4$, $X = 3$			
Option B:	When $Y = 0, X = 3$			
Option C:	When $X = 3$, $Y = 0.4$			
Option D:	When $X = 0$, $Y = 3$			
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9.	If all the dots of a scatter diagram lie on a straight line falling from left bottom corner			
	to the right upper corner, the correlation is called			
Option A:	Zero correlation			
Option B:	High degree of positive correlation			
Option C:	Perfect negative correlation			
Option D:	Perfect positive correlation			
10.	A point estimator is defined as			
Option A:	A single value from the sample			
Option B:	Average of all sample values			
Option C:	Average of all population values			
Option D:	A single value that is best estimate of unknown population parameter			

Q2 (20 Marks)	Solve any Two Questions out of Three 10 marks each
A	What do you mean by a questionnaire? What is the difference between a questionnaire and a schedule? State the essential points to be remembered in drafting a questionnaire.
B	In a simple study about coffee habits in two Towns A and B the following information is given Town A: Females were 40%, total coffee drinkers were 45% and female non coffee drinkers were 20%. Town B: Males were 55%, male non coffee drinkers were 30% and female coffee drinkers were 15% Present the data into a table format
	Explain the following Point Estimation Properties with example i) Consistency ii) Unbiasedness

Q3 (20 Marks)	Solve	any Two	Question	ons out o	f Three			10 marks each
A	What is		st for sing					
	Perform simple linear regression, Determine slope and intercept							
B	X	1	2	3	3	4	5	
	ζY	8	4	5	2	2	0	
	300	\$57						

The data with regard to the output of gram and cost of seed and labour per hectare at eight farmers' fields, are as given below:

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Sr. No.	Cost of produce (Y) (Rs./hectare)	Cost of Seed (X1) (Rs./hectare)	Cost of Labour (X2) (Rs./hectare)
1	190	50	10
2	50	30	10
3	300	150	15
4	100	50	15
5	150	40	20
6	90	40	10
7	300	100	35
8	120	60	14

- a) Fit a regression ŷ = a + b₁x₁ + b₂x₂
 b) Find the coefficient of multiple determination (R²).
- c) Also test the significance of regression (Given the appropriate Table value, F =13.27, for a significance level of $\alpha = 0.01$)

Q4 (20 Marks)	Solve any Four Questions out of Six 05 marks each			
A	What is Stratified sampling? Explain the merits and limitations of Stratified sampling.			
В	Explain the following methods to check the performance of Regression Model i) MAE ii) MAPE			
С	In a trivariate distribution, the simple coefficients of correlation are as follows: If $r_{12} = 0.86$, $r_{13} = 0.65$ and $r_{23} = 0.72$, calculate the coefficient of partial correlation $r_{12.3}$.			
D	What is diagrammatic representation of data? Explain its advantages.			
	The manufacturer of a certain make of electric bulbs claims that his bulbs have a mean life of 25 months with standard deviation of 5 months. A random sample of 6 such bulbs gave the following values Life of bulb in months 24,26,30,20,20,18			
	Is the manufacturer's claim valid at 1% level of significance? (Given that the table values of the appropriate test statistics at said level are 4.032,3.707 and 3.499 for 5, 6 and 7 degree of freedom respectively)			
F	Explain method of maximum likelihood with its advantages and disadvantages			