

Name. _____		Printed Pages:02		
Student Admn. No.: _____				
<b>School of Basic and Applied Sciences</b> <b>Backlog Examination, June 2023</b> <b>[Programme: B.Sc(H)Mathematics] [Semester: IV ] [Batch: 2020-23 ]</b>				
Course Title: Econometrics		Max Marks: 100		
Course Code: BSCM404		Time: 3 Hrs.		
<b>Instructions:</b>	1. All questions are compulsory. 2. Assume missing data suitably, if any.			
		K Level	COs	Marks
<b>SECTION-A (15 Marks)</b>		<b>5 Marks each</b>		
1.	Explain simple linear regression model with an example.	K1	CO1	5
2.	The correlation coefficient between two variables X and Y is $r=0.60$ . If $b_{xy}=1.50$ , $b_{yx}= 2.00$ , $\bar{x}=10$ and $\bar{y}=20$ , find the equations of the regression lines of (a) y on x, (b) x on y.	K2	CO2	5
3.	Define inclusion of irrelevant variable and omitting of relevant variable in a regression model.	K1	CO1	5
<b>SECTION-B (40 Marks)</b>		<b>10 Marks each</b>		
4.	The ranks of same 16 students in Mathematics and Physics are as follows. Two numbers with in brackets denote the ranks of the students in Mathematics and Physics: (1, 1), (2, 10) (3, 3) (4, 4) (5, 5) (6, 7) (7, 2) (8, 6) (9, 8) (10, 11) (11, 15) (12, 9) (13, 14) (14, 12) (15, 16) (16, 13). Calculate the rank correlation coefficient for proficiencies of this group in Mathematics and Physics.	K2	CO2	10
5.	The child mortality (CM) on per capita GNP (PGNP) and the female literacy rate (FLR) for a sample of 64 countries. The regression results g are reproduced below with some additional information: $CM_i = 263.6416 - 0.0056 PGNP_i - 2.2316 FLR_i$ $se = (11.5932) (0.0019) (0.2099)$ Test hypothesis for $\beta_2 = 0$ against $\beta_2 \neq 0$ .	K4	CO3	10
6.	a) Explain Homoscedasticity with the help of an example. b) Explain multicollinearity with the help of an example.	K3	CO1	10
7.	Derive normal equations for linear regression model. OR Find the coefficient of correlation to the following data:	K4	CO3	10

X	10	14	18	22	26	30
Y	18	12	24	6	30	36

**SECTION-C (45 Marks)**

**15 Marks each**

8.

Fit multiple linear regression curve for  $y$  as a function of  $x_1$  and  $x_2$  using following data:

$x_1$	0	1	1	2
$x_2$	0	1	2	1
$y$	15.1	17.9	12.7	25.6

K5

CO4

15

9.

When estimating a multiple linear regression model based on 30 observations, the following results were obtained:

	Coefficients	Standard Error
Intercept	153.95	124.08
$x_1$	12.14	2.89
$x_2$	2.35	2.08

Write the equation of regression model for given data.

Find 95% and 99% confidence interval for  $\beta_2$ .

K5

CO3

15

10

Fit a least-square linear curve to the data given in the following table:

X	0	1	2	3	4	5	6
Y	2.4	2.1	3.2	5.6	9.3	14.6	21.9

OR

Explain different types of functional form of regression model with examples.

K5

CO2

15