Total No. of Questions : 6]

SEAT No. :

P1659

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M.A/M.Sc.

GEOGRAPHY

Gg. 320 - Multivariate Statistics

(2013 Pattern) (Credit System) (Semester - III)

Time : 2½ Hours] *[Max. Marks : 38*

Instructions to the candidates:

1) ***Attempt any two questions from question number 1 to 4***
2) ***Questions 5 and 6 are compulsory.***
3) ***Figures to the right indicate full marks.***
4) ***Use of statistical tables and calculator is allowed.***

Q1) a) What is a J matrix and an identity matrix? **[2]**

b) Prove the commutative theorem for multiplication. **[4]**

c) Find A * B **[4]**

$$A = \begin{pmatrix} 65 & 675 & 876 \\ 87 & 987 & 905 \\ 543 & 654 & 957 \end{pmatrix} \quad B = \begin{pmatrix} 78 & 0 & 71 \\ 97 & 8 & 79 \\ 54 & 4 & 39 \end{pmatrix}$$

Q2) a) What do you mean by data reduction in multivariate statistics? **[2]**

b) Using the data given below find the A_0, A_1 and A_2 determinants. **[4]**

X	2	5	8	13	16	19	22	25	29
Y	9	13	21	27	25	26	17	13	9

c) From the determinants found in above Q2b obtain the second degree bivariate regression equation and interpret the results. **[4]**

Q3) a) The following table records the observed values for X1, X2 and Y variables. Find the means and variances for X1, X2 and Y **[2]**

Y	0.7	0.8	0.9	1.3	1.6
X1	2	7	10	12	14
X2	3.4	3.6	3.9	4.2	4.8

b) Using the data given in Q3 a find the A_0, A_1 and A_2 determinants. **[4]**

c) Using the determinants obtained above compute a multiple regression equation, explained variance and interpret the results. **[4]**

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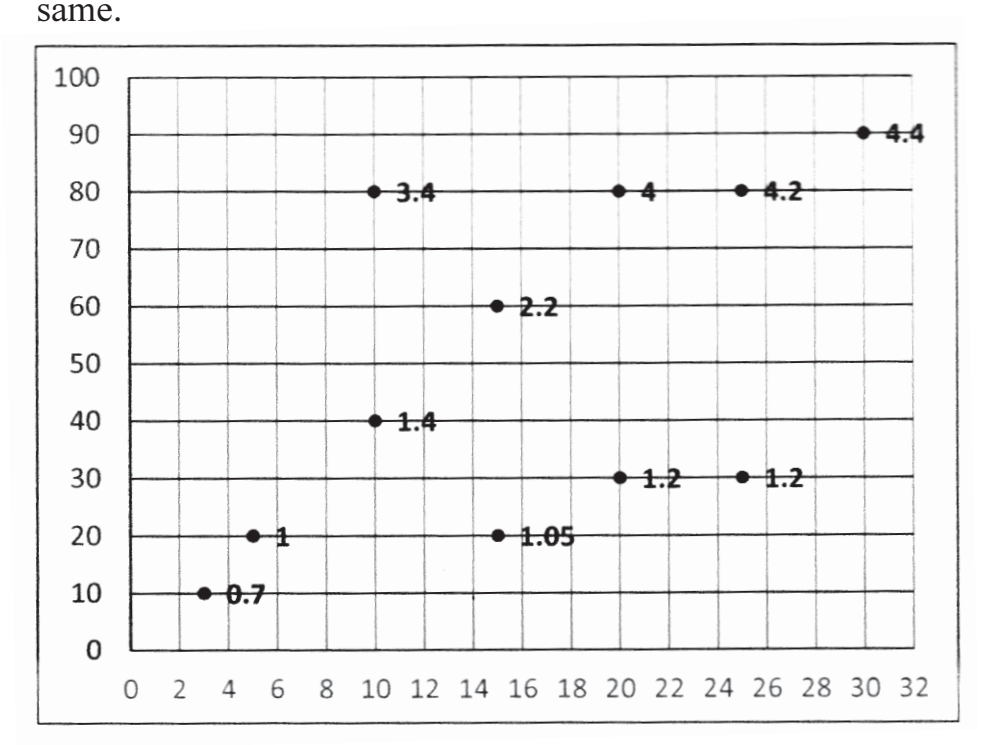
Q4) a) Define the term varimax rotation **[2]**

b) Using the following matrix obtain the first factor loadings matrix. **[4]**

	X1	X2	X3	X4	X5
X1	1	0.558	0.842	0.65	0.48
X2		1	0.53	0.585	0.65
X3			1	0.886	0.772
X4				1	0.634
X5					1

c) Compute Eigen vector and the variance explained by the factor loadings from the above given data and interpret the results. **[4]**

Q5) a) Following graph depicts the depths in meters at different locations. Prepare an appropriate table and obtain a trend surface equation for the same. **[5]**



b) Obtain the explained variance, level of significance at 0.05 level for the result obtained from Q5 a and interpret the results. **[4]**

Q6) a) Using the correlation matrix given in Q.4 b compute the first Principal component loadings. **[5]**

b) From the Principal loadings obtained in the Q.6 a find Eigen value, explained variance and interpret the results. **[4]**

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