* U A - 3 7 3 1 *

UA-3731

Second Year B. C. A. (Sem. III) Examination

March/April – 2012

Numerical & Statistical Methods

Time : Hours] [Total Marks : 70

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.
Name of the Examination :
☛ S. Y. B. C. A. (Sem. 3)
Name of the Subject :
☛ Numerical And Statistical Methods
☛ Subject Code No. : 3 7 3 1 ☛ Section No. (1, 2,.....) : NIL

Seat No. :

Student's Signature

(2) Attempt all questions.
(3) Figures to right indicate full marks.
(4) Mention your options clearly.
(5) Question no. 1 is compulsory.

1 Do as directed. **10**

(i) What do you mean by absolute error ?

(ii) If root $X_0 = 1.5$ and the function of equation is $X = (x-3)^{1/3}$ then what will be the value of root X_1 when iteration method is applicable for that equation.

(iii) Find 3^{rd} divided differences with argument 2, 4, 9, 10 of the function $f(x) = x^3 - 2x$.

(iv) A firm has collected the following data.
45, 41, 40, 45, 42, 43, 45, 43.
Compute mean and mode

(v) The runs scored by a batsman in six innings are 60, 45, 25, 40, 60 and 32. Find Standard Deviation.

(vi) Value of r^2 lies between _____ and _____ ?

(vii) Co - efficient of correlation between two variables X and Y is 0.05 and 9 pairs are considered. Find probable limit within which populated co-efficient lies.

(viii) Evaluate $\int_1^2 \frac{1}{x} dx\, dy$ simpson's $\frac{1}{3}$ rule with 4 strips.

(ix) Write the value of r if two variables are uncorrelated.

(x) Approximate value of variable is 3.436. If true value X of variable lies in the interval [3.431, 3.441]. Find the value of upper limit of the absolute error.

2 (a) Using Interation method obtain approximate root correct upto 4 decimal place of $x=(5-x)^{1/3}$ 6

(b) Find $\sin(0.197)$ from the following table. 6

X	0.15	0.17	0.19	0.21	0.23
$Sin\ X$	0.14944	0.16918	0.18886	0.20846	0.22798

OR

2 (a) Find approximate root correct upto 4 decimal place of $f(x)=x^2-5x+2=0$, using Newton Raphson method. 6

(b) Given the table of values find $\sqrt{155}$, using Logranges interpolation formula. 6

X	150	152	154	156
$Y=\sqrt{X}$	12.247	12.329	12.410	12.490

3 (a) From the following table obtain $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x=1.0$. 6

x	1.0	1.05	1.10	1.15	1.20	1.25	1.30
$y=f(x)$	1.0	1.025	1.049	1.072	1.095	1.118	1.140

(b) Solve the following equations by Gauss Seidal Method. 6

$20x+2y+6z=28$

$x+20y+9z=-23$

$2x-9y+20z=-57$

OR

3 (a) Evaluate $\int_1^3 \frac{dx}{x}$ by taking 8 equal intervals using simpson's rule. 6

(b) Solve the following system of equations by using Gauss elimination method. 6

$2x+y-z=-1$

$x-2y+3z=9$

$3x-y+5z=14$

4 (a) Find mean and median from the following data : 6

Class	15-25	.25-35	35-45	45-55	55-65	65-75
Frequency	4	11	19	14	0	2

(b) Given the following frequency distribution with some missing frequencies. 6

Class	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	185	x	34	180	136	y	50

If the total frequency is 685 and median is 42.6 then find the value of missing frequency x and y.

OR

4 (a) Calculate mean and median from following data : 6

X	0	1	2	3	4	5	6	7	8
Frequency	1	9	26	59	72	52	29	7	1

(b) The following are some of the particular of the distribution of two group. 6

	Group A	Group B
Nos.	100	50
Mean Weights	60 Kgs.	45 Kgs.
Variance	9	4

Find the Standard Deviation of the Combined data.

5 (a) The following data are obtained for the variables x and y. $n = 30, \sum x = 120, \sum y = 90 \sum x^2 = 600, \sum y^2 = 250, \sum xy = 356$. Later on it was observed that two pails were wrongly taken as (8,10) and (12,7) instead of (8,12) and (10,8). Find the correct value of co-relation Co - efficiant. 6

(b) Given the following data calculate : 6

(i) The probable value of y when x = 12.

(ii) The probable value of x when y = 30

r = 0.8

	X	Y
Mean	27.6	14.8
S.D.	40	20

OR

5 (a) The Co-efficient of rank correlation between marks in statistics and marks in Maths obtain by a certain group is 0.8. If the sum of square of the differences in ranks is given to be 33, then find the numbers of students in the group. 6

(b) Calculate correlation Co-efficient for the following data and also calculate coefficient of determination. 6

X	8	7	6	1	2	3	9	4	5
Y	16	14	13	9	8	10	15	12	11

6 (a) The following data relate to the Ages of husband and wifes. 6

Age of Husband	25	28	30	32	35	36	38	39	42	45
Age of Wife	20	26	29	30	25	18	26	34	35	46

Obtain the two regrassion equations and determine the most likely age of husbands for age of wife is 25 years, and most likely age of wife for the age of husband 39 years.

(b) Information about advertisement and sales of some consumer product given below : 6

	Advertisement Expenditure (X) (Rs. Crores)	Sales (Y) (Rs. Crores)
Mean	20	120
S.D.	5	25

Correlation Coefficient = 0.8

(i) Calculate the two regrassion lines.

(ii) Find the likely sales when advertisment expenditure is Rs. 25 crores.

OR

6 (a) Obtain the regression line of y on x using the following data : 6

$$\sum x = 21, \sum y = 20, \sum x^2 = 91, \sum xy = 74, n = 7$$

(b) The equation of two lines of regression are the following : 6

$2x + 3y - 8 = 0$ and

$x + 2y - 5 = 0$

Obtain the value of correlation coefficient and variance of Y. Given that the variance of X is 12.