



**KA-3731-R**  
**Second Year B. C. A. (Sem. III) Examination**  
**October / November – 2012**  
**Numerical & Statistical Methods**  
**(Old Course)**

Time : Hours]

[Total Marks : 70

**Instructions :**

(1)

<p>नीचे दशांशवैव निशानीवाणी विगतो उत्तरवही पर अवश्य लખवी. Fillup strictly the details of signs on your answer book.</p> <p>Name of the Examination : <b>SECOND YEAR B. C. A. (SEM. 3)</b></p> <p>Name of the Subject : <b>NUMERICAL &amp; STATISTICAL METHODS (OLD)</b></p> <p>Subject Code No. : <b>3 7 3 1</b> Section No. (1, 2,.....) : <b>Nil</b></p>	<p>Seat No. : <table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"><tr><td style="width: 15%;"></td><td style="width: 15%;"></td><td style="width: 15%;"></td><td style="width: 15%;"></td><td style="width: 15%;"></td><td style="width: 15%;"></td></tr></table></p> <p style="text-align: center; border: 1px solid black; border-radius: 10px; padding: 5px;">Student's Signature</p>						

- (2) Attempt all questions.
- (3) Figures to right indicate full marks.
- (4) Mention your options clearly.

1 Do as directed :

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- (i) State the condition for the iteration method to be successful for  $F(x) = 0$ .
- (ii) The approximate root of the equation  $x^3 - 3x + 4 = 0$  has between \_\_\_\_\_ and \_\_\_\_\_.
- (iii) For a Simpson's 1/3 and 3/8 rule, interval is divided in how many subintervals ?
- (iv) Construct Backward difference table of  $Y(0)=1, Y(1)=0, Y(2)=1, Y(3)=10, Y(4)=33$ .
- (v) Find an interval in which root of equation  $x^3 - x - 1 = 0$
- (vi) Compute mean from the following data :  
45, 41, 40, 45, 43, 43, 45
- (vii) In rank correlation coefficient if  $\sum d^2 = 0, \rho =$  \_\_\_\_\_
- (viii) If mean = 68, mode = 28.5 and c.v = 58 then median = \_\_\_\_\_
- (ix) What is measure of central tendency ?
- (x) If  $byx = 0.52$  and  $bxy = 2.5$ . Is it true ?

- 2 (a) Using the Bisection method obtain approximate root correct upto three decimal space of  $F(x) = x^2 - 7x + 8 = 0$ . 6
- (b) The following values of the function  $F(x)$  for values  $x$  are given  $F(1)=4, F(2)=5, F(7)=5, F(8)=4$ . Find the value of  $F(6)$  by using lag ranges interpolation formula. 6

OR

- 2 (a) Find approximate root correct upto three decimal space for the equation  $F(x) = x^3 - 3x - 5 = 0$  using Newton Rapson Method. 6
- (b) Find log 301 from given data by using Newtons divide difference : 6

$X$	300	304	305	307
$F(x) = \log X$	2.4771	2.4829	2.4843	2.4847

- 3 (a) Calculate the approximate values of  $\int_{-3}^3 x^4 dx$  by using (i) Tropezoidal Rule (ii) Simpson's  $\frac{1}{3}$  rule by dividing. 6
- (b) Solve the following system of equations by Gauss Seidal Method (Perform four iteration) 6

$$\begin{aligned} 6x + y + z &= 105 \\ 4x + 8y + 3z &= 155 \\ 5x + 4y - 10z &= 65 \end{aligned}$$

OR

- 3 (a) Solve the following system of equations by Gauss Elimination method : 6

$$\begin{aligned} 2x + y + z &= 10 \\ 3x + 2y + 3z &= 18 \\ x + 4y + 9z &= 16 \end{aligned}$$

- (b) Find  $\frac{dy}{dx}$  and  $\frac{d^2y}{dx^2}$  when  $x = 0.1$  from the following data : 6

$x$	0.0	0.1	0.2	0.3	0.4
$y(x)$	1.000	0.9975	0.9900	0.9776	0.9604

- 4 (a) Calculate mean and median from the following frequency distribution : 6

Size	0-9	10-19	20-29	30-39	40-49	50-59
Frequency	3	4	8	7	6	3

- (b) Given the following results, which of two group is better in individual observation : 6

	Group A	Group B
$\sum x$	45	60
$\sum (x-\bar{x})^2$	100	102
$n$	20	30

OR

- 4 (a) Define mean and mode and calculate mean and mode : 6

Marks	0-10	10-20	20-30	30-40	40-50
No. of Students	2	4	9	7	3

- (b) Calculate the mean deviation from mean for the following data : 6

Class	20-24	25-29	30-34	35-39	40-44	45-49
Frequency	3	5	2	6	2	2

- 5 (a) Find the co-efficient of correlation between age and the sum assured from the following table : 6

Age Group (years)	Sum Assured (in Rs.)					Total
	10000	20000	30000	40000	50000	
20-30	4	6	3	7	1	21
30-40	2	8	15	7	1	33
40-50	3	9	12	06	2	32
50-60	8	4	2	-	-	14
Total	17	27	32	20	4	100

- (b) The ranking of 10 students in accordance with their performance in two subjects *A* and *B* are as follows. Calculate the rank correlation coefficient :

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<i>A</i>	6	5	3	10	2	4	9	7	8	1
<i>B</i>	3	8	4	9	1	6	10	7	5	2

OR

- 5 (a) Rank of 15 students in Mathematics and statistics are given below. The figure indicate ranks. Find correlation coefficient.

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(1,2), (7,9), (2,1), (9,7), (12, 15), (8,8), (6,5), (3,3), (13, 13), (15, 14), (14, 11), (10, 10), (11, 12), (4, 6), (5, 4).

- (b) Find rank correlation coefficient between the data given below. If two or more items have the same rank then what adjustment made Spearman's formula :

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<i>x</i>	17	13	15	16	6	11	14	9	7	12
<i>y</i>	36	46	35	24	12	18	27	22	2	8

- 6 (a) Obtain the regression equations from the following data and estimate *x* for *y* = 25, correlation coefficient = 0.8 :

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	<i>x</i>	<i>y</i>
Average	25.5	40
S.D.	2.4	6

- (b) Find the equation of regression lines from the following data and also estimate *y* for *x* = 1 and *x* for *y* = 4 :

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<i>x</i>	3	2	-1	6	4	-2	5	7
<i>y</i>	5	13	12	-1	2	20	0	-3

OR

- 6 (a) Two regression lines are  $x + 2y - 5 = 0$  and

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$2x + 3y - 8 = 0$  and  $S_x^2 = 12$ , find *x*, *y*,  $S_y^2$  and  $\rho$

- (b) The following information is obtained for two variables *X* and *Y*. Find two regression equations. Also find correlation coefficient

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$n = 25, \sum x = 125, \sum y = 100, \sum x^2 = 650, \sum y^2 = 440, \sum xy = 508$