



DM-0783

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

September / October – 2006

P - 301 : Computer Oriented Numerical & Statistical Methods

Time : 3 Hours]

[Total Marks : 70

Instructions :

(1)

नीचे दशांशवैध निशान्तीवाणी विगतो उत्तरवली पर अवश्य लपवी.  
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 :  
P - 301 : Comp. Oriented Numerical & Stat. Methods

Subject Code No. : 0 7 8 3 Section No. (1, 2,.....): Nil

Seat No. :  
0 0 0 2 7 0

Student's Signature

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

1 Do as directed :

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- (a) Fill up blanks :
- (1) The value of correlation coefficient is between \_\_\_\_\_ and \_\_\_\_\_.
  - (2) In rank correlation if  $\sum d^2 = 0$ ,  $r =$  \_\_\_\_\_.
  - (3) The two regression coefficients are 0.8 and 0.2, hence correlation coefficient is \_\_\_\_\_.
  - (4) Two regression lines intersect each other at (\_\_\_\_\_, \_\_\_\_\_)
  - (5) If mean = 34, mode = 26.5 and coefficient of variation = 50 then median = \_\_\_\_\_.
- (b) Write true or false with reason :
- (1) The approximate root of the equation  $x^2 - 3x + 4 = 0$  has between -2 and -3.
  - (2) The standard deviation of 6, 6, 6, 6 is 6.
  - (3) If  $b_{yx} = -0.8$ ,  $b_{xy} = -0.45$  hence  $r = 0.6$ .
  - (4) If  $\sum d^2 = 0$  then there is no correlation between the two variables.
  - (5) The correlation coefficient 0.6 indicates twice the relationship than the correlation coefficient 0.3.

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[Contd...

- 2 (a) Use Bisection method to find a real root of the equations correct up to 3 decimal places 12

$$x^3 - 2x - 1 = 0$$

- (b) From the following table calculate  $e^{0.45}$  :

$x$	0.1	0.2	0.3	0.4	0.5
$y = e^x$	1.1052	1.2214	1.3499	1.4918	1.6487

OR

- 2 (a) Using the False position method, find approximate root of the equations correct upto 3 decimal places : 12

$$x^3 - x^2 - 2 = 0$$

- (b) By the use of Lagrange's formula find the profit for the year 1978 :

Year	1970	1977	1979
Profit ('00000)	8.5	12	10

- 3 (a) Calculate the approximate values of  $\int_{-3}^3 x^4 dx$  by using 12

(i) Trapezoidal rule (ii) Simpson's  $\frac{1}{3}$  rule by dividing this range in six intervals.

- (b) Solve the following system of equations by Gauss Seidal Method (perform four iteration)

$$6x + y + z = 105$$

$$4x + 8y + 3z = 155$$

$$5x + 4y - 10z = 65$$

OR

- 3 (a) From the following table evaluate  $\frac{dy}{dx}$  and  $\frac{d^2y}{dx^2}$  12

at  $x = 1.4$  :

$x$	1.4	1.6	1.8	2.0	2.2
$y$	4.0552	4.9530	6.0496	7.3891	9.0250

- (b) Solve the following system of equations by Gauss Elimination method :

$$2x + y + z = 10,$$

$$3x + 2y + 3z = 18$$

$$x + 4y + 9z = 16$$

- 4 (a) Marks obtained by 25 students are given below calculate Mean and Mode : 12

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

- (b) Find the standard deviation of the following series :

$x$	10	11	12	13	14
Frequency	3	12	18	12	3

OR

- 4 (a) Define Mean and Median and compute mean and median from the following data : 12

$x$	10-19	20-29	30-39	40-49	50-59	60-69
$f$	12	19	31	27	16	8

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

Class	0-3	3-6	6-9	9-12	12-15	15-18	18-21
Frequency	2	7	10	12	9	6	4

- 5 (a) Find the correlation coefficient between the length and weight : 12

Length in inches	3	4	6	7	10
Weight in 'oz-s	9	11	14	15	16

- (b) Two judges have given ranks to 10 students for their honesty. Find the rank correlation coefficient :

1st Judge	1	6	5	10	3	2	4	9	7	8
2nd Judge	3	5	8	4	7	10	2	1	6	9

OR

- 5 (a) The following table shows the scores in an intelligence test of 67 students of different age groups. Find the correlation coefficient between age and scores of the test : 12

Scores	Age in Years				Total
	18	19	20	21	
200-250	4	4	2	1	11
250-300	3	5	4	2	14
300-350	2	6	8	5	21
350-400	1	4	6	10	21
Total	10	19	20	18	67

(b) Obtain rank correlation coefficient :

x	123	108	125	137	156	112	107	136
y	168	158	178	189	197	169	159	179

6 (a) Obtain the regression equations from the following data and estimate  $x$  for  $y=25$ , correlation coefficient = 0.8 : 12

	x	y
Average	25.5	40
S.D.	2.4	6

(b) Obtain equations of two regression lines from the following data :

x	2	8	10	-2	5	-4
y	3	2	5	10	-2	-3

OR

6 (a) The equations of regression lines of  $y$  on  $x$  and  $x$  on  $y$  are respectively as follows : 12

$$2x - 5y + 40 = 0$$

$$10x - 9y = 120$$

Hence

(i) Obtain the means of  $x$  and  $y$

(ii) Estimate  $x$  when  $y=40$

(iii) Estimate  $y$  when  $x=60$

(iv) Obtain correlation coefficient between  $x$  and  $y$ .

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

x	3	2	-1	6	4	-2	5	7
y	5	13	12	-1	2	20	0	-3