



RE-1841

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

April / May – 2010

Computer Oriented Numerical &  
Statistical Methods

Time : Hours]

[Total Marks : 70

**Instructions :**

(1)

नीचे दशांशों के निशानों की विंगतों उत्तरवली पर अवश्य लक्षणी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="S. Y. B. C. A. (Sem. 3)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="COMPUTER ORIENTED NUMERICAL &amp; STATISTICAL METHODS"/>	<input type="text"/>
Subject Code No. : <input type="text" value="1"/> <input type="text" value="8"/> <input type="text" value="4"/> <input type="text" value="1"/>	<input type="text"/>
Section No. (1, 2,.....) : <input type="text" value="NIL"/>	
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

- (1) If correlation co-efficient and between  $x$  and  $y$  is 0.5 then correlation co-efficient between  $3-x$  and  $4-2y$  is \_\_\_\_\_
- (2) Find 3<sup>rd</sup> divided differences with argument 2, 4, 9, 10 of the function  $f(x) = x^3 - 2x$ .
- (3) The root of the equation  $f(x) = x^3 - 9x + 1$  lies between \_\_\_\_\_ and \_\_\_\_\_
- (4) The scores of 10 students in a test out the maximum marks 100 were as follows : 58, 48, 68, 70, 74, 84, 86, 90, 92, 35 then standard deviation = \_\_\_\_\_
- (5) The two regression co-efficients are 0.4 and 0.8 then correlation co-efficient  $r =$  \_\_\_\_\_  
Write True or False with reason.
- (6) The approximate root of the equation  $x^3 - 2x - 1 = 0$  lies between -2 and -3.

- (7) If  $\sum d^2 = 0$  then there is no correlation between two variables.
- (8) If  $b_{yx} = -0.8$ ,  $b_{xy} = -0.5$  then  $r = -0.6$ .
- (9) The standard deviation of 10, 10, 10, 10 and 10 is 0.
- (10) For iteration method to find an approximate root it is necessary that  $|\phi'(x)| > 1$ .

- 2 (a) Find a real root of the equation  $x^3 - 2x - 5 = 0$  using Newton Raphson method up to three decimal places. **6**
- (b) In the following table values of  $y$  are consecutive term of a series of which the number 31 is 5th term then find 1<sup>st</sup> and 10<sup>th</sup> term : **6**

$x$	3	4	5	6	7	8	9
$y$	13	21	31	43	37	73	91

OR

- 2 (a) Find a real root of the equation  $x^3 + x^2 - 1 = 0$  up to four decimal places using iteration method. **6**
- (b) Given the table of values find  $\sqrt{155}$  using Lagrange's interpolation formula : **6**

$x$	150	152	154	156
$y = \sqrt{x}$	12.247	12.329	12.410	12.490

- 3 (a) Solve the following integrals using Simpson's  $\frac{1}{3}$  rule by taking 4 strips of interval : **6**

(1)  $\int_3^7 x^2 \log x \, dx$

(2)  $\int_1^3 \frac{1}{x} \, dx$ .

- (b) Solve the following system of equations using Gauss elimination method : **6**

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

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

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

OR

- 3 (a) Evaluate  $\int_{-1}^1 x^4 dx$  by taking 6 stripes using 6

Trapazoidal rule, Simpson's  $\frac{1}{3}$  rule, Simpson's  $\frac{3}{8}$  rule.

- (b) Solve the following system of equations using Gauss-seidal method : 6

$$2x + y + z = 5$$

$$3x + 5y + 2z = 15$$

$$2x + y + 4z = 8$$

- 4 (a) Define mean following is the frequency distribution of weights of the 100 students at xyz university. Find arithmetic mean of the weight of the students : 6

<i>Weight (kg)</i>	60-62	63-65	66-68	69-71	72-74
<i>No. of students</i>	5	18	42	27	8

- (b) From the following data calculate mean deviation : 6

<i>Marks:</i>	0-10	10-20	20-30	30-40	40-50	50-60	60-70
<i>No. of students:</i>	6	5	8	15	7	6	5

**OR**

- 4 (a) Define mode from the following data determine the value of mode : 6

<i>No. of days absent:</i>	0-4	4-8	8-12	12-16	16-20	20-24
<i>No. of students:</i>	5	50	100	60	20	15

- (b) The following are the runs scored by two batsman A and B in innings. State which one is more consistent : 6

<i>A</i>	101	27	0	36	82	45	7	13	65	14
<i>B</i>	97	12	40	96	13	8	85	8	56	15

- 5 (a) Find the value of correlation co-efficient from the following data : 6

<i>x</i>	161	163	184	180	166	168	175	170	170	173
<i>y</i>	63	58	75	72	67	70	75	70	60	80

- (b) Find the value of correlation co-efficient between x and y for the following data : 6

	<i>X - series</i>	<i>Y - series</i>
<i>Mean</i>	51	34
<i>Sum of squares of Deviations from mean</i>	42	60

Sum of products of the deviation from mean = -16  
Total Pairs = 8

- 5 (a) Following results are obtained for two variables 6

$$x \text{ and } y \quad \sum x = 125, \sum x^2 = 650, \sum xy = 508,$$

$$\sum y = 100, \sum y^2 = 460, n = 25$$

On subsequent verification it was found that two pairs (8, 12) and (6, 18) were wrongly taken as (6, 14) and (8, 6). Find correct value of correlation co-efficient.

- (b) A selection board consisting of two experts for the 6  
post of general manager in a company interviewed 10  
candidates, whom two judges assigned rank as below.  
Find rank correlation coefficient :

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

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

$$2x + 3y - 8 = 0 \text{ and } S_x^2 = 12 \text{ then find } S_y^2, \bar{x}, \bar{y} \text{ and } r.$$

- (b) Find both regression equations using following data : 6

x	11	7	2	5	8	6	10
y	7	5	3	2	6	4	8

OR

- 6 (a) The following table gives the age of cars of certain 6  
make and annual maintenance cost obtain regression  
equation for cost related to age :

Age of cars in years	2	4	6	8
Maintenance cost (in Rs. hundred)	10	20	25	30

estimate the maintenance cost for a ten year car.

- (b) Obtain the regression line y on x using the following 6  
data and estimate y when  $x = 62$

$$\sum x = 580, \sum y = 370, \sum xy = 11490,$$

$$\sum x^2 = 41650, \sum y^2 = 30860, n = 10.$$