



SB-1441

Second Year B. C. A. (Sem. - III) Examination  
March / April - 2011  
Computer Oriented Numerical & Statistical Methods

Time : Hours]

[Total Marks : 70

Instructions :

(1)

नीचे दृष्टावेक निशानीवाणी विगतो उत्तरवही पर अवश्य कभवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
☛ S. Y. B. C. A. (SEM. - 3)	<input type="text"/>
Name of the Subject :	<input type="text"/>
☛ COMPUTER ORIENTED NUMERICAL & STATISTICAL METHODS	<input type="text"/>
☛ Subject Code No. : <input type="text"/> 1 <input type="text"/> 4 <input type="text"/> 4 <input type="text"/> 1	Student's Signature
☛ Section No. (1, 2,.....) : <input type="text"/> NIL	

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

1 Do as directed :

10

- (1) What is meant by absolute error ?  
(2) Show that iterative method applied to the equation

$$x = (5 - x)^{1/3}$$

- (3) Find Mode for the following data :  
1, 2, 3, 3, 4, 4, 4  
(4) If covariance between two variables  $X$  and  $Y$  is 20.25 and Standard deviation of  $X$  and  $Y$  are 6 and 4.5 respectively, calculate correlation coefficient between  $X$  and  $Y$ .  
(5) The method of fitting of regression line are \_\_\_\_\_ and \_\_\_\_\_.  
(6) Write the general formula for trapezoidal rule.  
(7) If  $y_0 = 1, y_1 = 5, y_2 = 19, y_3 = 55$  find  $y(x)$ .  
(8) Find variance for the following data :  
4, 6, 10, 12, 18

- (9) For the iteration method to find an approximate root it is necessary that  $|\phi'(x)| > 1$ , is it true or false ?
- (10) For use of Simpson's  $\frac{1}{3}$  and  $\frac{3}{8}$  rule interval is divided in to how many subintervals.

- 2 (a) Find an approximate root correct to 3 decimal places for the equation  $x^3 - 4x - 9 = 0$  using Bisection method. **6**
- (b) By divided difference formula find  $f(8)$  and  $f(15)$ . **6**

$X$	4	5	7	10	11	13
$Y$	48	100	294	900	1210	2028

**OR**

- 2 (a) Find approximate root correct upto 3 decimal space for the equation  $f(x) = x^3 - 3x^2 - 3 = 0$  using iteration method. **6**
- (b) The population of a town goes as given below. Estimate the population for the year 1925 : **6**

Year ( $x$ )	1891	1901	1911	1921	1931
Population (Thousand)	46	66	81	93	101

- 3 (a) Find the value of  $\int_0^1 \frac{1}{1+x^2} dx$  using Trapezoidal rule **6**  
by taking  $h = 0.5, 0.25, 0.125$ .
- (b) Solve the following linear system by Gauss-elimination method. **6**
- $$5x - 2y + z = 4$$
- $$7x + y - 5z = 8$$
- $$3x + 7y + 4z = 10 \text{ (By 5 iteration)}$$

**OR**

- 3 (a) Solve the following system of equation by Gauss-Seidal method : 6

$$10x + 2y + z = 9$$

$$2x + 20y - 2z = -44$$

$$-2x + 3y + 10z = 22$$

- (b) From the following table obtain  $\frac{dy}{dx}$  and  $\frac{d^2y}{dx^2}$  at 6

$$x = 1.4.$$

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

- 4 (a) Define mean. Calculate mean and median for the following : 6

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

- (b) The time taken by 12 runners in a race were 73, 82, 75, 68, 70, 90, 80, 71, 78, 65, 70, 66 seconds. 6  
Find the standard deviation and co-efficient of variation.

OR

- 4 (a) Define mode. Calculate mean and median for the following data : 6

Class	3-5	5-10	10-20	20-50	50-80	80-100
Frequency	8	12	40	70	15	5

- (b) The median of a frequency distribution of marks of 400 students is 38.5. Find the missing frequencies : 6

Marks	11-20	21-30	31-40	41-50	51-60	61-70	71-80
No. of Students	42	38	a	54	b	36	32

- 5 (a) Calculate rank correlation co-efficient : 6

$x$	48	33	40	9	16	16	65	24	16	57
$y$	13	13	24	6	15	4	20	9	6	19

- (b) Find correlation co-efficient using following data : 6  
 $\eta = 13$ ,  $\Sigma x = 117$ ,  $\Sigma x^2 = 1313$ ,  $\Sigma y = 260$ ,  $\Sigma y^2 = 6580$ ,  
 $\Sigma xy = 2827$

OR

- 5 (a) Calculate correlation coefficient : 6

$x$	300	350	400	450	500	550	600	650	700
$y$	800	900	1000	1100	1200	1300	1400	1500	1600

- (b) Calculate correlation coefficient : 6

Marks in Economics →	40-49	50-59	60-69	70-79	80-89	90-99
Marks in Accounts ↓						
90-99	–	–	–	2	4	4
80-89	–	–	1	4	6	5
70-79	–	–	5	10	8	1
60-69	1	4	9	5	2	–
50-59	3	6	6	2	–	–
40-49	2	5	4	–	–	–

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

$x$	4	5	6	7	1	2	3
$y$	6	5	6	5	2	4	7

- (b) The following information is obtained for two variables  $X$  and  $Y$ . Find two regression equations and also find correlation coefficient. 6

$$\eta = 25, \Sigma x = 125, \Sigma y = 100, \Sigma x^2 = 650, \Sigma y^2 = 440, \Sigma xy = 508$$

OR

- 6 (a) The regression equation of two variables are 6

$$5y = 9x - 22$$

$$20x = 9y + 350$$

Find means of  $x$  and  $y$  also value of  $r$ .

- (b) Find the most likely production corresponding to a rainfall of 40 inches from the following data : 6

	Rainfall (in inches)	Production (in quintals)
Average	35	50
Standard deviation	5	8

coefficient of correlation  $r = 0.8$ .