



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.

Name of the Examination :
S. Y. B. C. A. (SEM. - 3)

Name of the Subject :
COMPUTER ORIENTED NUMERICAL & STATISTICAL METHODS

Subject Code No. : 1 4 4 1 Section No. (1, 2,.....) : NIL

Seat No. :

Student's Signature

- (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

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[Contd...

- (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. Find the standard deviation and co-efficient of variation. 6

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

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

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 $r = 0.8$.