



5 + 2 = 70

BW-0783

Seat No. _____

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

April / May – 2006

P - 301 : Computer Oriented Numerical & Statistical Methods

Time : 3 Hours]

[Total Marks : 70

Instructions :

(1)

नीचे दशांशों में निम्नलिखित विगतो उत्तरपत्री पर अवश्य लिखनी.
Fillup strictly the details of signs on your answer book.

Name of the Examination :

Name of the Subject :

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

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

(a) Fill up blanks :

(i) If rank x and y are equal then rank correlation coefficient will be 1.

$$r = \frac{1 - 6 \sum d^2}{n(n^2 - 1)}$$

(ii) If correlation coefficient r between x and y is 0.5, then r between $4x$ and y is _____.

(iii) The value of r^2 lies between 0 and 1.

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(iv) If all the points, in a scatter diagram are in one line, $r = \pm 1$.

(v) The approximate root of the equation $x^3 + 2x + 1 = 0$ lies between 1 and -1.

(b) Write true or false with reason :

(i) If two variables are independent, $r = 0$.

(ii) If $\sum d^2 = 0$ then there is no correlation between the two variables.

(iii) For two related variables $b_{yx} = -1.7$ and $b_{xy} = -0.7$.

(iv) If two regression coefficients are -4.0 and 0.25 the regression line coincides.

(v) For iteration method to find an approximate root it is necessary that $|\phi'(x)| > 1$.

2 (a) Find an approximate root correct upto 3 decimal

12

places of $x = \frac{1}{(x+1)^2}$ by using the method of iteration.

(b) From the following table estimate the population for the year 1985 :

Year x :	1951	1961	1972	1981	1991
Population : y (in '000)	46	66	81	93	101

OR

[Contd...

Newton Raphson

2 (a) Use Newton - Raphson method to find the roots of the equations, $x^4 - x - 10 = 0$ correct up to 3 decimal places.

12

Interpolation

(b) Using Newton's divided difference formula find $\log(10.5)$.

x :	10	11	13	14	16
Log :	1.00	1.0414	1.1139	1.1461	1.2041

Forward

3 (a) From the following table evaluate $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = 2.2$.

12

x :	1.4	1.6	1.8	2.0	2.2
y :	5.056	5.953	7.050	8.389	10.025

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

Gauss elimination

$$3x + 2y + z = 10, \quad 2x + 3y + 2z = 14,$$

$$x + 2y + 3z = 14$$

OR

Simpson's

3 (a) Calculate the approximate value of $\int_0^1 \frac{dx}{1+x^2}$

12

by using :

- (i) Trapezoidal rule
- (ii) Simpson's 3/8 rule by dividing its range in six intervals.

Gauss
Seidel.

(b) Solve the following system of equation by Gauss Seidel method (perform four iteration) -

$$10x + 2y + z = 9, 2x + 20y - 2z = -44$$

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

4 (a) Define mean and median and calculate mean and median from the following data : 12

mean
median.

Time (in Minutes):	10-15	15-20	20-25	25-30	30-35	35-40	40-45
No. of Workers:	8	14	18	25	15	14	6

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

mean
deviation

Class Interval:	2-4	4-6	6-8	8-10
Frequency:	3	4	2	1

OR

4 (a) Define mode and calculate mode of the following frequency distribution : 12

mode

Class:	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59
Frequency:	3	5	10	20	12	6	3	1

(b) The following data refer to the dividend (%) paid by two companies A and B cover the last seven years

Coefficient
variation

A:	4	8	4	15	10	11	9
B:	12	8	3	15	6	4	10

Calculate the coefficient of variation and comment.

auss

12

10-45
6

the

12

5-59
1

by
rs

ntd...

$\frac{2(x-2)(y-4)}{\sqrt{(2x-2)^2 + \sqrt{(2y-4)^2}}$
12
Pearson

Calculate the correlation coefficient between the height of father and height of son from the given data :

12

Height of father (in inches) :	64	65	66	67	68	69	70
Height of son (in inches) :	66	67	65	68	70	68	72

(b) Calculate Spearman's coefficient of correlation between marks assigned to 10 students by judges X and Y in certain competitive test as shown below :

MARK

Marks by X Judge :	52	53	42	60	45	41	37	38	25	27
Marks by Y Judge :	65	68	43	38	77	48	35	30	25	50

OR

5 (a) Find the correlation coefficient between age and salary of 50 workers in a factory :

12

Bi Variate

Age in Years	Daily Pay in rupees				
	160-169	170-179	180-189	190-199	200-209
20-30	5	3	1	—	—
30-40	2	6	2	1	—
40-50	1	2	4	2	2
50-60	—	1	3	6	2
60-70	—	—	1	1	5

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(b) The ranks in C and C++ of 10 students are given in brackets. Find the rank correlation coefficient.

(8, 3), (1, 5), (6, 2) (3, 9), (2, 10), (5, 1), (4, 6)

(10, 4), (9, 7), (7, 8)

Rank

6 (a) Two regression lines are $x + 2y - 5 = 0$ and $2x + 3y - 8 = 0$ and $S_x^2 = 12$, find 12

Regression

\bar{x}, \bar{y}, S_y^2 and r .

(b) Find the equations of regression lines and the correlation coefficient from the following data :

co-efficient
co-relation

x :	28	41	40	38	35	33	46	32	36	33
y :	30	34	31	34	30	26	28	31	26	31

OR

6 (a) The following data are obtained from 25 pairs of x and y 12

co

$\sum x = 125, \sum y = 100,$

$\sum x^2 = 650, \sum y^2 = 440, \sum xy = 508$

co-relation
co-efficient

Find equations of regression lines. Also find correlation coefficient.

(b) From the following data obtain regression equations between height and weight. Estimate the height of a person whose weight is 60 kg and the weight of a person whose height is 160 cm.

Height (in cm) :	165	174	170	162	166	165	168	155	150	180
Weight (in kg) :	64	70	66	65	69	63	66	58	55	73

12

12