



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 दशांशवेष निशानीवाणी विगतो उत्तरवही पर अवश्य लक्षवी.
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 8 4 1 Section No. (1, 2,.....) : NIL

Seat No. : [] [] [] [] [] []

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 3rd 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.

RE-1841]

1

[Contd...

- (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 1st and 10th 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

$$\begin{aligned} 2x + y + z &= 5 \\ 3x + 5y + 2z &= 15 \\ 2x + y + 4z &= 8 \end{aligned}$$

- 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

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

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

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

OR

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

No. of days absent :	0-4	4-8	8-12	12-16	16-20	20-24
No. of students :	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

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

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

x	161	163	184	180	166	168	175	170	170	173
y	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

	X - series	Y - series
Mean	51	34
Sum of squares of Deviations from mean	42	60

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

OR
3

RE-1841]

[Contd...

- 5 (a) Following results are obtained for two variables 6
 x and y $\sum x = 125, \sum x^2 = 650, \sum xy = 508,$
 $\sum y = 100, \sum y^2 = 460, n = 25$

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
 $2x + 3y - 8 = 0$ and $S_x^2 = 12$ then find S_y^2, \bar{x}, \bar{y} 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 $x = 62$

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

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