



N-1441

Second Year B. C. A. (Sem. III) Examination
October / November – 2011
Numerical & Statistical Methods

Time : Hours] **301**

[Total Marks :

Instructions :

(1)

नीचे दशांशक निशानोंवाली विनती उपर्युक्त पर अवश्य लक्षणी.
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 :
NUMBER & 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 right indicate full marks
- (4) Mention you options clearly.
- (5) Question No. 1 is compulsory.

1 Do as directed :

10

- (1) What is interpolation ?
- (2) If mean of the data is 275 and the total frequency is 52 then find $\sum f_i x_i$.
- (3) Find an interval in which root of the equation $x^3 - 2x - 1 = 0$ lies.
- (4) Find mode for the following data :
45, 42, 43, 40, 41, 40, 42, 45, 46, 40
- (5) What is the standard deviation of 8, 8, 8, 8, 8, ?
- (6) If the sum of rank difference of 7 pairs are 74 then find co-efficient of correlation.
- (7) Make the forward difference table for the following data :

X	80	85	90	95	100
Y	5026	5670	6300	7390	7850

- (8) $b_{yx} = 1.17, S_x^2 : S_y^2 = 9 : 81$ find r and b_{xy} .
- (9) If two variables are having ranks in reverse order, write the value of r.

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[Contd...

(10) Write a general formula for trapezoidal rule.

2 (a) Find approximate root correct up to 4 decimal place of $F(x) = x^3 - x - 1 = 0$ using iteration method. **6**

(b) The area of a circle of diameter 'd' is given for the following values : **6**

d	20	25	30	35	40
A	1085	1674	2362	2088	2854

Find approximate value for the area of circle of diameter 31.

OR

2 (a) Find approximate root correct up to 4 decimal place of $F(x) = x^3 - 3x - 5 = 0$ using newton raphson method. **6**

(b) The values of a function $F(x)$ for values are given. $F(1) = 4, F(2) = 5, F(7) = 5, F(8) = 4$. Find the value of $F(6)$ by using lagranges interpolation formula. **6**

3 Compute $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ for the following data at $x = 2$: **6**

X	1	2	3	4	5	6
Y	1	8	27	64	125	216

(b) Solve the following system of equation by Gauss. Seidal method : **6**

$$\begin{aligned} 10x + 2y + z &= 9 \\ 2x + 20y - 2z &= -44 \\ -2x + 3y + 10z &= 22 \end{aligned}$$

OR

3 (a) Evaluate $\int_0^1 \frac{dx}{1+x^2}$ using trapezoidal rule, (take $h = 0$) **6**

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

$$\begin{aligned} 5x + 2y + z &= 12 \\ x + 4y + 2z &= 15 \\ x + 2y + 5z &= 20 \end{aligned}$$

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

Class	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	4	6	20	10	7	3

- (b) The time taken by 12 runners in a race were 73, 83, 86, 90, 105, 70, 71, 78, 65, 66, 82, 86 seconds. Find the standard deviation and co-efficient of variation. 6

OR

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

In come (Rs.)	100	150	80	200	250	180
No. of Persons	24	26	16	20	6	30

- (b) Mean of the following classified continuous data is 19.57 and assumed mean is 19.75. The following is the distribution of variable d_i find the original distribution : 6

d_i	-3	-2	-1	0	1	2
F_i	2	6	12	20	8	2

- 5 (a) In order to find the correlation coefficient between two variables X and Y from 12 pairs of observations, the following results are available : 6

$$\sum x = 30, \sum y = 5, \sum x^2 = 670, \sum y^2 = 285, \sum xy = 344$$

Later it was found that one particular pair of the observation (10, 14) was wrong taken as (11, 4). Find correct value of the coefficient correlation.

- (b) The following table shows the frequency distribution of the final grades of 100 students in mathematics and accountancy. Determine coefficient of correlation : 6

		Marks in Accountancy					
Marks in Maths		40-49	50-59	60-69	70-79	80-89	90-99
90-99		-	-	-	2	4	4
80-89		-	-	1	4	6	5
70-79		-	-	5	10	8	2
60-69		1	4	9	5	2	-
50-59		3	6	6	2	-	-
40-49		2	5	4	-	-	-

OR

- 5 (a) The coefficient of rank correlation between X and Y was obtained as -0.05 and the sum of the squares of the differences in ranks is 126, find the number of observations. 6

- (b) Calculate the Spearman's coefficient of correlation from the following bivariate data : 6

X	48	33	40	9	16	16	65	24	16	57
Y	13	13	24	6	15	4	20	9	6	19

- 6 (a) From the following data, find the two regression equations : 6

X	4	5	6	7	1	2	3
Y	6	5	6	5	2	4	7

- (b) Information of marks (X) scored by students in accountancy and statistics (Y) is given below. 6

Mean marks scored in accountancy = 20

Mean marks scored in statistics = 25

Variance of marks scored in accountancy = 4

Variance of marks scored in statistics = 9

Correlation coefficient between marks in accountancy and statistics = 0.75

Obtain two regression lines if a person scored 18 marks in accountancy, estimate his marks in statistics and if he scored 22 marks in statistics, estimate his mark in accountancy.

OR

- (a) For bivariate data following information is given : 6

$$\bar{X} = 7, \bar{Y} = 21.25, n = 4$$

$$\sum (x-7) = 24, \sum (y-20)^2 = 225, \sum (X-7)(Y-20) = 60.$$

Obtain the regression line of Y on X.

- (b) The regression equation of two variable are 6

$$5y = 9x - 22$$

$$20x = 9y + 350$$

Find means of X and Y also value of r.