



ME-3735

Second Year B. C. A. (Sem. III) Examination
October/November – 2013
301 : Statistical Methods

Time : 3 Hours]

[Total Marks : 70

Instructions :

(1)

नीचे दृशविव - निशानीवाणी विगतो उत्तरवही पर अवश्य लखवी.
Fillup strictly the details of signs on your answer book.

Name of the Examination :
Second Year B. C. A. (Sem. 3)

Name of the Subject :
301 : Statistical Methods

Subject Code No. : 3 7 3 5 Section No. (1, 2,.....) : NIL

Seat No. :

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Student's Signature

- (2) All questions are compulsory.
(3) Figures to the right indicate full marks.
(4) Mention your options clearly.

1 Do as directed :

14

- (i) Define Mean.
(ii) Compute median for the following data :
4, 6, 5, 8, 12, 7, 10, 5, 15, 9, 10, 11.
(iii) If two variable are perfectly correlated and one regression co-efficient is 0.5. Find another regression co-efficient.
(iv) Show that correlation efficient is geometric mean between two regression co-efficient.
(v) What is the standard deviation of 5, 5, 5, 5 and 5.
(vi) If two variables have perfect positive correlation then $r =$ _____.
(vii) If the sum of rank difference of 7 pairs are 74 then find co-efficient of correlation.
(viii) If mean of the data is 275 and the total frequency is 52 then Find $\sum FiXi$.
(ix) In rank correlation coefficient if $\sum d^2 = 0$, $P =$ _____.
(x) If $\bar{X} - M = 3$ and $Z = 2$ then find mean and median.
(xi) If two regression lines are $X + 3Y - 7 = 0$ and $2X + 5Y = 12$, then \bar{X} and \bar{Y} are _____ and _____.

- (xii) If $n(n-1) = 90$ and $\sum d^2 = 82.5$ find rank correlation coefficient.
- (xiii) What is regression line ? Give the method of their estimation.
- (xiv) Find b_{xy} from the following :
 $S_x = 19.4, S_y = 2.7, r = 0.5.$

2 Attempt any two :

- (a) The human resource manager at a city hospital began a study of the overtime hours of the registered nurses. Twenty Five nurses were selected at random and following overtime hours during a month were recorded :

13 13 12 15 7 15 5 12 6 7 12
10 9 13 12 5 9 6 10 5 6 9
6 9 12

Calculate the arithmetic mean of overtime hours during the month.

- (b) Find the missing frequencies in the following frequency distribution.

The arithmetic mean of given data is 11.09 :

Class	Frequency	Class	Frequency
9.3-9.7	2	11.3-11.7	14
9.8-10.2	5	11.8-12.2	6
10.3-10.7	F3	12.3-12.7	3
10.8-11.2	F4	12.8-13.2	1

Total Frequency = 60

- (c) The following are the profit figures earned by 50 companies in the country :

Profit (in Rs. lakh)	No. of Companies
10 or less	4
20 or less	10
30 or less	30
40 or less	40
50 or less	47
60 or less	50

Calculate the median.

3 Attempt any two : 14

(a) The distribution of age at the marriage of grooms with brides of age group 15.39 is displayed here :

Age groups (years) :	15-19	19-23	23-27	27-31	31-35	35-39
No. of grooms :	8	59	47	23	6	4

Calculate mean deviation.

(b) Monthly wages of employee in a factory are distributed as given below :

Wages (Rs.) :	300-400	400-500	500-600	600-700	700-800	800-900	900-1000	1000-1100
No. of employee :	15	22	18	14	9	7	5	4

Calculate variance of given distribution

(c) Find the standard deviation from the following data :

Item :	6	7	8	9	10	11	12
Frequency :	3	6	9	13	8	5	4

4 Attempt any two : 14

(a) The following table gives indices of industrial production and numbers of registered unemployed people. (in lakh) Calculate the value of the co-rrrelation coefficient.

Year :	1991	1992	1993	1994	1995	1996	1997	1998
Index of Production :	100	102	104	107	105	112	103	99
No. of unemployed :	15	12	13	11	12	12	19	26

(b) The following table gives the frequency, according to the marks, obtained by 67 students in an intelligence test. Measure the degree of relationship between age and marks :

Test Marks	Age in years				Total
	18	19	20	21	
200-250	4	4	2	1	11
250-300	3	5	4	2	14
300-350	2	6	8	5	21
350-400	1	4	6	10	21
Total	10	19	20	18	67

- (c) Ten competitors in a beauty contest are ranked by three judges in the following order :

Judge - 1	1	6	5	10	3	2	4	9	7	8
Judge - 2	3	5	8	4	7	10	2	1	6	9
Judge - 3	6	4	9	8	1	2	3	10	5	7

Use the rank correlation coefficient to determine which pair of judges has the nearest approach to common tastes in beauty.

- 5 Attempt any two :

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- (a) The following data relate to the scores obtained by 9 salesman of a company in an intelligence test and their weekly sales. (in Rs. 1000's)

Salesman :	A	B	C	D	E	F	G	H	I
Test Scores :	50	60	50	60	80	50	80	40	70
Weekly Sales :	30	60	40	50	60	30	70	50	60

- (i) Obtain the regression equation of sales on intelligence test scores of the salesman.
(ii) If the intelligence test score of a salesman is 65, what would be his expected weekly sales.
- (b) You are given the following information about advertising expenditure and sales :

	Advertisement (X) Rs. in lakh	Sales (Y) Rs. in lakh
Arithmetic Mean	10	90
Standard deviation	3	12

Correlation coefficient = 0.8

Obtain two regression equation.

- (c) In a partially destroyed laboratory record of an analysis of regression data, the following results only are legible :

Variance of $X = 9$

Regression equations : $8X - 10Y + 66 = 0$ and $40X - 18Y = 214$.

Find : (i) The mean value of X and Y .

(ii) Coefficient of correlation between X and Y .

(iii) Standard deviation of Y .