

Seat No. : _____

DE-107

December-2017

**SY M.Sc. (CA & IT) Integrated
Computer Oriented Statistical Methods**

Time : 3 Hours]

[Max. Marks : 100

- Instructions :** (1) Statistical tables will be provided on Request.
(2) Use of Non-programable scientific calculator is allowed.

1. Attempt any **two** : **20**

(1) Calculate Mean, Median, Mode and D_7 from the following data : **10**

Class Interval	Frequency	Class Interval	Frequency
260-269	6	300-309	16
270-279	16	310-319	10
280-289	27	320-329	2
290-299	23		

(2) The following data are given for two companies. Combining the data for groups of male and female employees. Find out (i) which company has a higher average productivity per employees, and (ii) which company has more consistent productivity. **10**

Productivity per employee	Company A		Company B	
	Males	Females	Males	Females
Mean	30	23	27	32
Variance	8	3	12	5
No. of employee	40	10	20	30

(3) Calculate the first four moments about the mean and also values of β_1 and β_2 , from the following data : **10**

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Students	8	12	20	30	15	10	5

2. Attempt any **two** : 20

- (1) Ten bank branches of a nationalised bank from Ahmedabad city were selected and their performances in deposits and advances were compiled. Calculate the rank correlation co-efficient after making adjustments for tied ranks. 10

Deposits	4.8	3.3	4.0	0.9	1.6	1.6	6.5	2.4	1.6	5.7
Advances	1.3	1.3	2.4	0.6	1.5	0.4	2.0	0.9	0.6	1.9

- (2) You are given the following information about advertising and sales : 10

	Advertising Expenditure (₹ Lakhs)	Sales (₹ Lakhs)
Mean	10	90
Standard deviation	3	12
Correlation Co-efficient	0.8	

- (a) Calculate the two regression lines.
 (b) Find the likely sales when advertisement expenditure is ₹ 15 lakhs.
 (c) What should be advertisement expenditure if the company wants to obtain a sales target of ₹ 120 Lakhs ?
- (3) Data compiled from the annual reports of 65 small to medium sized industries are given below. Calculate the correlation co-efficient between sales turnover (X) and the advertising expenditure (Y). 10

Sales turnover (in ₹ Lakhs)	Advertising expenditure (in ₹ '000s)			
	5-15	15-25	25-35	35-40
75-125	3	3	1	2
125-175	2	4	3	2
175-225	3	4	4	8
225-275	4	5	7	10

3. Attempt any **two** : 20

- (1) Assume four year cycle, calculate the trend by the method of moving average from the following data relating to production of coffee. 10

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Production (kg.)	464	515	518	467	502	540	557	571	586	612

- (2) Five cards are drawn at random from a pack of 52 cards. Find the probability that. 10
- (1) All are diamond
 (2) Two are red and three are black
 (3) There are two cards of clubs and three cards of diamond
 (4) Three are kings and two are aces.
- (3) Random samples drawn from two city give the following data relating to the heights of adult female: 10

	Country-A	Country-B
Mean height in inches	67.42	67.25
Standard deviation in inches	2.58	2.50
Number in samples	1000	1200

- (1) Is the difference between the means significant ?
 (2) Is the difference between the standard deviation significant ?

4. Attempt the following : 20

- (1) A random variable X has the following probability distribution : Find its expected value and standard deviation. 10

X	0	1	2	3	4	5	6	7	8	9
p	0.02	0.07	0.09	0.12	0.20	0.20	0.18	0.10	0.01	0.01

- (2) The following data provides the values of sample mean \bar{x} and the range R for ten samples of size 5 each. Calculate the values of central line and control limits for mean chart and range chart, and determine whether the process is in control. 10

Sample No.	1	2	3	4	5	6	7	8	9	10
Mean	11.2	11.8	10.8	11.6	11.0	9.6	10.4	9.6	10.6	10.0
Range	7	4	8	5	7	4	8	4	7	9

5. Attempt any **two** : 20

- (1) From the adult female population of four large cities, random sample of sizes given below were taken and the number of educated and not educated recorded. Can we say that the proportion of educated female is same in all the four cities ? (Take alpha 5%) 10

City	A	B	C	D
Educated	53	80	68	57
Not educated	67	120	82	73

- (2) The sales data of an item in eleven shops before and after a special promotional campaign are as under. Can the campaign be judged to be a success ? Test at 1% level of Significance. 10

Shops	1	2	3	4	5	6	7	8	9	10	11
Before Campaign	23	20	19	21	18	20	18	17	23	16	19
After Campaign	24	19	21	18	20	22	20	20	23	20	27

- (3) A test was given to 5 students chosen at random from M.Sc. class of each of the three universities of Gujarat. Their score were found as follows : 10

Universities	Scores				
A	90	70	60	50	80
B	70	40	50	40	50
C	60	50	60	70	60

Perform analysis of variance and show if there is any significance difference between the scores of students in the three universities.

