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Shree Damodar College of Commerce and Economics Margao-Goa
S.Y.BCOM SemIII, Semester End Examination, October 2016

STATISTICAL TECHNIQUES

Duration: 2Hrs

Max. Marks:80

Instructions:

1. All questions are compulsory (choice is internal).
2. Start each question on fresh page.
3. Figures to the right indicate full marks.
4. Non programmable Calculators are allowed.
5. Graph paper will be provided on request.

Q1 Attempt the following:

- a) What do you mean by 'Primary' and 'Secondary' data? What are the various methods used in collecting primary data? 3
- b) The following data represent weights, recorded to the nearest kilogram, of 30 students selected from a school of 500 students: 6

21	30	40	25	26	22	39	31	29	36
38	35	34	33	30	23	27	27	29	31
33	22	21	36	40	31	33	30	37	36

1. In the above data, state what is the:
i) Population ii) Sample and iii) Variate.
 2. Make a frequency distribution table for the above data with class intervals 20-24, 25-29.
 3. State the class boundaries and the class mark of the class interval 25-29 and find the number of students with weights of less than or equal to 34.
- c) Draw a Ogive from the following data: 7

Size of items	6	12	18	24	30	36	42	48
frequency	12	16	15	14	13	20	22	18

Also find the value of median and quartiles graphically

OR

Q1 Attempt the following

- x) Explain the word "Statistics" and state its limitations? 3

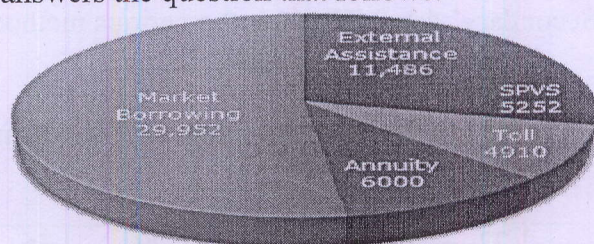
- y) A frequency distribution has 15 as the midvalue of the first class and classes are of equal size 5. If the cumulative frequencies of the various classes are 2, 24, 43, 57, 64, 70, 71, 72, respectively, find the original frequency distribution with appropriate class limits. Also calculate relative frequency and frequency density. 6

- z) Draw a Histogram from the following figures: 7

Wages(Rs)	100-199	200-299	300-399	400-499	500-599	600-699	700-799
No. of workers	12	22	35	48	26	14	8

Q2 Attempt the following

- a) The following pie-chart shows the sources of funds to be collected by the National Highways Authority of India (NHAI) for its Phase II projects. Study the pie-chart and answers the question that follows: 3



Sources of funds to be arranged by NHAI for Phase II projects (in crores Rs.)

- Find the approximate ratio of the funds to be arranged through Toll and that through Market Borrowing.
- If the toll is to be collected through an outsourced agency by allowing a maximum 10% commission, how much amount should be permitted to be collected by the outsourced agency, so that the project is supported with Rs. 4910 crores?
- Through which source near about 20% of the funds are to be arranged?

- b) For the following distribution of income groups, find Mean: 6

Income (in Rs.)	0-200	200-400	400-600	600-800	800-1000	1000-1200
No. of persons	80	165	230	80	32	13

- c) From the table given below, find out coefficient of variation. State which of the two is more stable: 7

X	25	22	28	26	35	20	22	40	20	18	19	25
Y	18	15	20	17	22	14	16	21	15	14	15	17

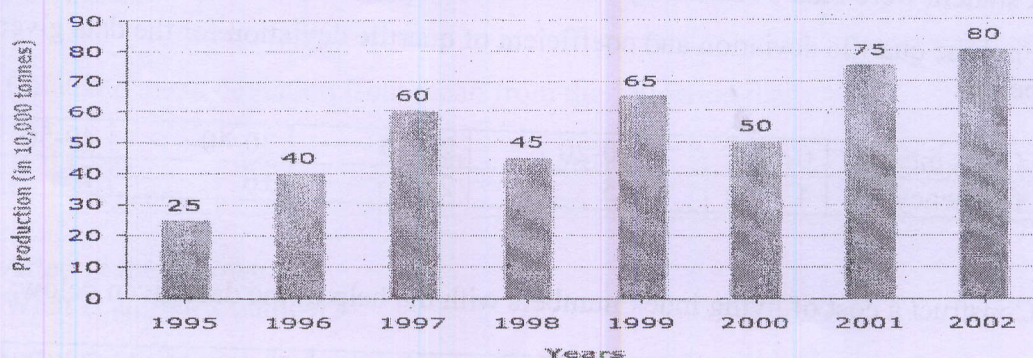
OR

Q2 Attempt the following:

- x) Study the bar chart and answer the question based on it.

3

Production of Fertilizers by a Company (in 1000 tonnes) Over the Years



1. What was the percentage decline in the production of fertilizers from 1997 to 1998?
2. The average production of 1996 and 1997 was exactly equal to the average production of which of the following pairs of years?
3. In which year was the percentage increase in production as compared to the previous year the maximum?

- y) Calculate Mode from the following frequency distribution:

6

Age in years	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of Persons	16	25	32	28	31	25	16

- z) Find Karl Pearson's Coefficient of skewness and interpret the type of distribution

7

Marks	0-5	5-10	10-15	15-20	20-25	25-30	30-35
No. of students	11	13	17	26	18	15	10

Q3 Attempt the following:

- a) A firm employing 30 workers and paying on an average of Rs.500 is amalgamated with another firm employing 20 workers paying an average of Rs. 600. Find the average pay of the new amalgamated firm.
- b) Find the median for the following data:

3

6

Class intervals	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
frequency	20	24	32	28	20	16	34	10	8

- c) Construct Laspeyre's and Paasche's index numbers of price from the following data:

7

Commodities	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	4	6	5	5
B	5	8	7	7
C	6	10	7	9
D	2	12	4	10

OR

- x) The average marks of 100 students was 40, later on it was discovered that 74 marks of a student were read 14 marks by mistake. Find out correct mean. 3
- y) Find the quartile deviation and coefficient of quartile deviation for the data given below: 6

Class interval	0-10	10-20	20-30	30-40	40-50
frequency	4	15	28	16	7

- z) Construct a cost of living index numbers with the help of the data given below: 7

Item	Weight	Base year price(Rs)	Current Year price(Rs)
1	25	2.50	1.75
2	50	1.30	2.10
3	15	5.00	3.75
4	10	0.75	1.50

Q4 Attempt the following

- a) What is a statistical average? Which average would be appropriate in the following cases: 3
1. Average income of a group of workers in a factory.
 2. Average size of ready-made shoes.
 3. Average change in rate of growth in per capita income.
 4. Average intelligence of students in a class.
- b) Calculate three-yearly moving averages for the following data. Represent the original data and trend values on the graph. 6

Year:	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Bank Clearances	8	10	13	9	10	11	10	15	16	12

- c) Calculate the quartiles, seventh decile and 58th percentile for the following data 7

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
frequency	10	16	24	28	32	25	18	25	12	10

Q4 Attempt the following:

- x) State with reasons or explanations, whether the following statements are true or false: 3
1. Coefficient of variation for any data can never be greater than 100%?
 2. Larger the variation, more representative is the average value.
 3. For normal distribution Interquartile range includes the central 50% items.

- y) Calculate four-yearly moving averages for the following data:

6

Year:	1986	1987	1988	1989	1990	1991	1992	1993	1994
Bank Clearances	53	79	76	66	69	94	105	87	79

- z) Calculate mean deviation from mean from the following data:

7

Class	0-10	10-20	20-30	30-40	40-50	50-60
frequency	3	7	15	12	8	5

Q5 Attempt the following:

- a) What is an index number?

3

- b) From the following data related to monthly wages of workers together with the price index numbers, compute the index numbers of real wages and interpret them.

6

year	1997	1998	1999	2000	2001
wages	72	80	96	118	182
index	100	110	120	140	200

The following data gives the annual sugar production (tons) of sugar factory:

7

- c)

Year	1970	1971	1972	1973	1974
Production	204	230	192	250	274

Using the method of Least Squares compute the trend line and estimate the annual sugar production for the year 1975.

OR

- x) Shift the base of the following series of Index number from 1998 to 2002 and recast the Index Numbers:

3

Year	1998	1999	2000	2001	2002
Index Nos.	100	160	200	256	300

- y) From the following data splice index B to A

6

Year	1998	1999	2000	2001	2002	2003
Index A	100	160	200	-	-	-
Index B	-	-	100	128	150	160

- z) Fit a second degree trend curve to the following data:

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Year	1971	1972	1973	1974	1975	1976	1977
Sales (in lac rupees)	12	13	16	18	23	28	34

Estimate the sales in 1978