Shree Damodar College of Commerce and Economics,Margao-Goa

S.Y.B.COM, SEM III, May/June Supplementary Examination 2016

**STATISTICAL TECHNIQUES(NEW COURSE)**

Duration: 2 hours

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. Log tables and graph papers will be supplied on request.

Q1

a) Distinguish between : 3

1. Population and Sample.
2. Parameter and Statistics

b) Draw the histogram and obtain graphically the mode from the following data 6

| Profit(in Rs) | 5-10 | 10-15 | 15-20 | 20-25 | 25-30 | 30-35 | 35-40 |
|---|---|---|---|---|---|---|---|
| No. of shops | 8 | 18 | 27 | 21 | 10 | 28 | 7 |

c) The following is the distribution of height of students in a class: 7

| Height (in cms) | 100-110 | 110-120 | 120-130 | 130-140 | 140-150 |
|---|---|---|---|---|---|
| No. of students | 5 | 8 | f | 10 | 7 |

If the median of the distribution of height is 127.Find the number of students belonging to the height group 120-130 cms

**OR**

Q1

x) What are functions of statistics? 3

y) Draw 'less than' ogive for the following data and hence determine graphically the value of median. 6

| Wages(Rs) | 25-30 | 30-35 | 35-40 | 40-45 | 45-50 | 50-55 | 55-60 | 60-65 | 65-70 |
|---|---|---|---|---|---|---|---|---|---|
| No. of workers | 10 | 14 | 19 | 22 | 25 | 29 | 21 | 12 | 9 |

z) Find the mean life of lamps from the following data: 7

| Life (in hours) | 0-100 | 100-200 | 200-300 | 300-400 | 400-500 | 500-600 |
|---|---|---|---|---|---|---|
| No. of lamps | 8 | 25 | 45 | 12 | 7 | 3 |

Q2

a) Distinguish between Primary data and Secondary data 3

b) Find $D_4$ and $P_{96}$ for the data given below: 6

| Class Interval | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 |
|---|---|---|---|---|---|
| Frequency | 15 | 10 | 14 | 12 | 24 |

C) Calculate the standard deviation for the following distribution: 7

| Class interval | 0-20 | 20-40 | 40-60 | 60-80 |
|---|---|---|---|---|
| frequency | 1 | 3 | 4 | 2 |

**OR**

y) Find the harmonic mean for the following distribution: 6

| Class interval | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 |
|---|---|---|---|---|---|
| Frequency | 2 | 8 | 6 | 4 | 5 |

z) Find Karl Pearson's Coefficient of skewness and interpret the type of distribution 7

| x | -1 | 0 | 1 | 2 |
|---|---|---|---|---|
| f | 3 | 6 | 6 | 5 |

Q3

a) The following is the distribution of weights of 70 students 3

| Weights | 60-69 | 70-79 | 80-89 | 90-99 | 100-109 | 110-119 |
|---|---|---|---|---|---|---|
| students | 5 | 11 | 14 | 18 | 16 | 6 |

Find: i) Class boundaries for 90-99.
ii) Class mark for 110-119.
iii) Width of the class interval

b) Find the mode for the following data: 6

| Class intervals | 0-5 | 5-10 | 10-15 | 15-20 | 20-25 |
|---|---|---|---|---|---|
| frequency | 15 | 23 | 25 | 22 | 10 |

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) State various methods of collecting Primary data. 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

a) Following table gives the rainfall in mm of some areas of Mumbai on 26th July 2005. 3

| Area | Rainfall in mm. |
|---|---|
| Borivali | 2500 |
| Goregaon | 3000 |
| Bandra | 1750 |
| Kurla | 2250 |

Represent the above data by a simple bar diagram.

b) Compute mean deviation from mean and median for the following data relating to score of a player in the last 7 test matches. 6

c) The following data gives the annual sugar production (tons)of sugar factory: 7

| Year | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 |
|---|---|---|---|---|---|---|---|
| Production | 12 | 10 | 14 | 11 | 13 | 15 | 16 |

Compute the trend line by the method of least squares and estimate the annual sugar production for the year 1977.

**OR**

Q4

x) What is an Ogive curve? 3

y) Consider the following data and answer the questions given below: 6

| Company | No. of Workers | Mean monthly wages | Standard deviation of wages |
|---|---|---|---|
| A | 400 | 450 | 10 |
| B | 600 | 500 | 12 |

1. Which company pays a larger amount as wages?
2. Which company has greater variability in individual wages?
3. What is the combined mean wage of the workers in both companies?

z) The following table gives the number of workers employed in a small industry during the years 1981-1988.Calculate the four yearly moving averages. Represent the original data and trend values on the graph. 7

| Year | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 |
|---|---|---|---|---|---|---|---|---|
| No. of workers | 480 | 470 | 450 | 460 | 480 | 470 | 470 | 500 |

Q5

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 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 |
|---|---|---|---|---|---|---|---|---|---|---|
| wages | 300 | 360 | 450 | 480 | 500 | 550 | 560 | 600 | 640 | 700 |
| index | 100 | 120 | 180 | 200 | 220 | 250 | 280 | 300 | 320 | 400 |

c) Calculate three yearly moving averages and determine the trend values from the following data .Represent the original data and trend values on the graph. 7

| Year | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|---|---|---|
| Price | 110 | 115 | 116 | 118 | 119 | 120 | 122 | 124 |

**OR**

x) From the following fixed base index number construct chain base index numbers. 3

| Year | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|
| F.B.I No. | 100 | 120 | 150 | 180 |

y) From the following data splice index B to A 6

| Year | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Index A | 100 | 110 | 130 | 140 | 150 | - | - | - | - | - | - |
| Index B | - | - | - | - | - | 100 | 105 | 110 | 120 | 130 | 135 |

z) Fit a second degree trend curve to the following data: 7

| Year | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 |
|---|---|---|---|---|---|---|---|