

GOVERNMENT COLLEGE OF COMMERCE AND ECONOMICS  
BORDA – MARGAO.

B. Com Semester End Examination, October 2018  
Semester III, BUSINESS STATISTICS - I

Time duration : 2 hrs.

Max.Marks:80

- Instructions:**
- 1) All questions are compulsory.
  - 2) Figures to the right indicate marks.
  - 3) Use of only non- programmable and non-scientific calculators are allowed.
  - 4) Graph papers will be supplied on request.

1. a) Explain in brief : i) Discrete data ii) Parameter iii) Quantitative characteristic (3)

b) Draw 'less than' type cumulative frequency curve and hence find the median for the following data. (6)

|                |         |         |         |         |         |        |         |
|----------------|---------|---------|---------|---------|---------|--------|---------|
| Wages          | 10 – 20 | 20 - 30 | 30 - 40 | 40 - 50 | 50 - 60 | 60 -70 | 70 - 80 |
| No. of workers | 5       | 8       | 20      | 26      | 40      | 32     | 9       |

c) Calculate the Arithmetic Mean for the following data : (7)

|                 |        |         |         |          |           |
|-----------------|--------|---------|---------|----------|-----------|
| Class Intervals | 0 - 25 | 25 - 50 | 50 - 75 | 75 - 100 | 100 - 125 |
| Frequency       | 10     | 20      | 32      | 18       | 40        |

OR

1. x) Write a short note on "Drawback of Statistics" (3)

y) Draw a histogram for the following data and hence find the mode graphically. (6)

|                 |        |         |         |         |          |
|-----------------|--------|---------|---------|---------|----------|
| Marks           | 0 - 20 | 20 - 40 | 40 - 60 | 60 - 80 | 80 - 100 |
| No. of students | 8      | 18      | 20      | 16      | 5        |

z) Find the ninth decile and the ninetieth percentile for the following data : (7)

|                |         |         |         |         |       |       |        |
|----------------|---------|---------|---------|---------|-------|-------|--------|
| Class Interval | 30 - 40 | 40 - 50 | 50 - 60 | 60 - 70 | 70-80 | 80-90 | 90-100 |
| f              | 4       | 10      | 20      | 34      | 30    | 6     | 1      |

II. a) Write a short note on "survey"

(3)

b) Find the standard deviation for the following data :

(6)

|   |       |        |         |         |         |         |
|---|-------|--------|---------|---------|---------|---------|
| x | 0 - 5 | 5 - 10 | 10 - 15 | 15 - 20 | 20 - 25 | 25 - 30 |
| f | 10    | 18     | 25      | 30      | 20      | 15      |

c) Find the Paache's Index Number for the following data:

(7)

| Commodity | Base Year      |                   | Current Year   |                   |
|-----------|----------------|-------------------|----------------|-------------------|
|           | Price<br>$p_0$ | Quantity<br>$q_0$ | Price<br>$p_1$ | Quantity<br>$q_1$ |
| I         | 10             | 2                 | 30             | 3                 |
| II        | 50             | 5                 | 60             | 1                 |
| III       | 50             | 9                 | 60             | 5                 |
| IV        | 60             | 3                 | 70             | 6                 |

OR

II. x) Explain the terms : i) Class width ii) Inclusive class interval  
iii) Class mark

(3)

y) The sales of two stores in a week (6 working days) are as follows.  
Find which of the stores has consistent sales.

(6)

| Weekdays                       | 1  | 2  | 3  | 4  | 5  | 6  |
|--------------------------------|----|----|----|----|----|----|
| Store I<br>Sales in thousands  | 40 | 30 | 35 | 45 | 10 | 40 |
| Store II<br>Sales in thousands | 80 | 60 | 20 | 10 | 10 | 20 |

z) Construct the cost of Living Index Number for the following data :

(7)

| Group             | Base Year |       | Current Year |
|-------------------|-----------|-------|--------------|
|                   | $p_0$     | $q_0$ | $p_1$        |
| Food              | 35        | 4     | 50           |
| Clothes           | 40        | 6     | 45           |
| Fuel and Lighting | 60        | 2     | 70           |
| House Rent        | 70        | 4     | 80           |
| Miscellaneous     | 20        | 5     | 35           |

III. a) Draw a suitable diagram to represent the following information.

(3)

|           | Selling Price | Quantity Sold | Wages | Materials | Miscellaneous | Total |
|-----------|---------------|---------------|-------|-----------|---------------|-------|
| Factory X | 400           | 50            | 3200  | 2400      | 1600          | 7200  |
| Factory Y | 600           | 30            | 6000  | 6000      | 9000          | 21000 |

b) Fit a linear trend for the following series and estimate the trend value for the year 2000.

(6)

| Year                             | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|----------------------------------|------|------|------|------|------|------|------|
| Expenditure in crores of rupees. | 125  | 128  | 133  | 135  | 140  | 141  | 143  |

c) Find the Bowley's co-efficient of skewness for the following data.

(7)

|   |   |   |    |   |    |    |
|---|---|---|----|---|----|----|
| x | 2 | 4 | 6  | 8 | 10 | 12 |
| f | 3 | 9 | 12 | 8 | 5  | 10 |

OR

III. x) Draw a Pie diagram to represent the following information.

(3)

| Items         | Average expenditure ( in '00' Rs.) |
|---------------|------------------------------------|
| Food          | 3000                               |
| Clothing      | 1000                               |
| Rent          | 1500                               |
| Medical       | 800                                |
| Miscellaneous | 1000                               |

y) Calculate trend values by the method of least squares from the data given below and estimate the sales for the year 2013

(6)

| Year              | 2005 | 2006 | 2007 | 2008 | 2009 |
|-------------------|------|------|------|------|------|
| Sales (Rs. Lakhs) | 80   | 85   | 90   | 95   | 99   |

- z) Find the Karl Pearson's Coefficient of Skewness for the following data and interpret the result. (7)

|   |    |    |    |    |    |
|---|----|----|----|----|----|
| x | -5 | -3 | 0  | 3  | 5  |
| f | 8  | 20 | 36 | 24 | 12 |

- IV.a) Explain the following terms with reference to Time Series. (3)

- i) Seasonal variation
- ii) Cyclical variation

- b) Find the Mean deviation from the mean for the following data: (6)

|   |   |    |    |   |   |    |
|---|---|----|----|---|---|----|
| x | 5 | 6  | 7  | 8 | 9 | 10 |
| f | 9 | 13 | 18 | 8 | 3 | 1  |

- c) Using three yearly moving average determine the trend and plot the original data and trend values on the same graph. (7)

| Year                       | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|----------------------------|------|------|------|------|------|------|------|------|------|------|
| Production in (1000 units) | 130  | 132  | 133  | 135  | 138  | 134  | 136  | 134  | 136  | 137  |

OR

- IV. x) Explain the two types of models for a Time series. (3)

- y) Find the mean deviation from the mean for the following data: (6)

| Wages in Rs.        | 0 - 50 | 50 - 100 | 100 - 150 | 150 - 200 | 200 - 250 | 250 - 300 |
|---------------------|--------|----------|-----------|-----------|-----------|-----------|
| Number of employees | 10     | 70       | 80        | 100       | 150       | 90        |

- z) The following are the cost of living index numbers. Find the trend values assuming five yearly cycle. (7)

| Year                     | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|--------------------------|------|------|------|------|------|------|------|------|------|
| Cost of living Index No. | 100  | 110  | 120  | 150  | 125  | 120  | 118  | 110  | 140  |

- V.a) Prepare the Cumulative frequency table of 'less than' type for the following data: (3)

| Class Intervals | 0 - 10 | 10 - 20 | 20 - 30 | 30 - 40 | 40 - 50 | 50 - 60 | 60 - 70 | 70 - 80 | 80 - 90 | 90 - 100 |
|-----------------|--------|---------|---------|---------|---------|---------|---------|---------|---------|----------|
| f               | 2      | 3       | 7       | 10      | 20      | 35      | 25      | 15      | 2       | 1        |

- b) Find the Semi Inter Quartile Range for the following data: (6)

|                |     |     |     |    |    |    |    |    |
|----------------|-----|-----|-----|----|----|----|----|----|
| Weight in Kg.  | 120 | 110 | 100 | 85 | 75 | 65 | 55 | 40 |
| No. of persons | 15  | 20  | 32  | 46 | 70 | 63 | 52 | 22 |

- c) Find the Weighted Index Number for the following data using (7)

- i) Weighted Aggregative Method and ii) Weighted Average of Relatives Method

| Commodities   | Prices |      | Weightage<br>w |
|---------------|--------|------|----------------|
|               | 2000   | 2005 |                |
| Food          | 15     | 20   | 2              |
| Clothing      | 17     | 30   | 5              |
| Travelling    | 19     | 10   | 7              |
| Maintenance   | 26     | 32   | 8              |
| Miscellaneous | 20     | 45   | 3              |

OR

- V. x) Prepare the cumulative frequency table of 'greater than' type, for the following frequency distribution of 100 workers. (3)

| Age (in years) | 20 - 25 | 25 - 30 | 30 - 35 | 35 - 40 | 40 - 45 | 45 - 50 | 50 - 55 | 55 - 60 |
|----------------|---------|---------|---------|---------|---------|---------|---------|---------|
| No. of workers | 3       | 9       | 15      | 25      | 23      | 12      | 10      | 3       |

- y) Find the Range and coefficient of Range for the following data: (6)

| x | 30 | 80 | 100 | 133 | 130 | 90 |
|---|----|----|-----|-----|-----|----|
| f | 15 | 28 | 41  | 30  | 25  | 10 |

- z) Calculate the real income for the following data taking into account the increase in the standard of living for a particular section of society. (7)

| Year                        | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|-----------------------------|------|------|------|------|------|------|------|------|
| Per capita Income in Rs.    | 1500 | 1600 | 1650 | 1787 | 1965 | 2162 | 2486 | 2933 |
| Cost of living Index Number | 120  | 130  | 145  | 160  | 185  | 200  | 230  | 260  |