

Reg. No. : .....

Name : .....

**Third Semester B.Com. Degree Examination, December 2017**  
**First Degree Programme Under CBCSS**  
**Complementary Course III : CO 1331**  
**BUSINESS STATISTICS**  
**(2013 Adm.)**

Time : 3 Hours

Max. Marks : 80

**SECTION - A**

Answer all questions in **one** word to maximum **two** sentences. **Each** question carries **1** mark.

1. Define statistics.
2. Define Median.
3. Define Secondary Data.
4. Define Geometric Mean.
5. What are Quartiles ?
6. Define coefficient of variation.
7. Define index number.
8. What do you mean by cost of living index number ?
9. What is irregular variation ?
10. Define probability.

(10×1=10 Marks)



## SECTION - B

Answer **any eight** questions **not** to exceed in **one** paragraph. **Each** question carries **2** marks.

11. What are the main methods of collecting primary data ?
12. What are the different types of bar diagrams ?
13. What are the functions of averages ?
14. Explain clearly the relationship between mean, median and mode.
15. What is a scatter diagram ?
16. Define Rank Correlation.
17. What are the properties of regression coefficients ?
18. What is Fisher's index number ? Why is it designated ideal ?
19. Explain the utility of time series analysis.
20. State the 'Multiplication theorem' of probability with an example.
21. A ball is drawn at random from a box containing 5 red balls, 4 white balls and 5 blue balls. Determine the probability that it is
  - a) Red
  - b) White
  - c) Blue
  - d) Not red
22. If  $r = 0.6$  and  $n = 64$ , find Probable Error.

(8×2=16-Marks)

## SECTION - C

Answer **any six** questions **not** to exceed in **120** words. **Each** question carries **4** marks.

23. Three samples with sizes 110, 150 and 170 with means 88, 82 and 75 respectively were combined. Find the combined mean.
24. There are 500 workers working in a factory. Their mean wages was calculated as Rs. 200. Later on it was discovered that the wages of two workers were misread as 180 and 20 instead of 80 and 220. Find the correct mean.



25. From the following data, compute the cost of living index number for the year 2015 :

|                               |   |      |          |      |      |          |
|-------------------------------|---|------|----------|------|------|----------|
| Item                          | : | Food | Clothing | Rent | Fuel | Sundries |
| Weight                        | : | 8    | 3        | 2    | 2    | 3        |
| % increase in price over 2014 | : | 40   | 60       | 20   | 40   | 30       |

26. What are time reversal and factor reversal tests ?
27. Define time series. Briefly explain the components of time series.
28. From the following data, find trend using three yearly moving averages :

|        |   |      |      |      |      |      |      |      |      |      |
|--------|---|------|------|------|------|------|------|------|------|------|
| Year   | : | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
| Values | : | 38   | 46   | 45   | 50   | 54   | 60   | 55   | 6    | 64   |

29. You are given the following data :

|                    |    |    |
|--------------------|----|----|
|                    | X  | Y  |
| Arithmetic mean    | 36 | 85 |
| Standard deviation | 11 | 8  |

Correlation coefficient between x and y is 0.66. Find the two regression equations.

30. A bag contains 6 white, 4 red and 10 black balls. Two balls are drawn at random. Find the probability that they will both be black.

31. Distinguish between correlation and regression.

(6x4=24 Marks)

#### SECTION - D

Answer any two questions. Each question carries 15 marks.

32. Using the following data construct Fisher's ideal index and show that it satisfies Factor reversal test and Time reversal test :

| Commodity | Base Year |       | Current Year |       |
|-----------|-----------|-------|--------------|-------|
|           | Quantity  | Price | Quantity     | Price |
| A         | 12        | 10    | 15           | 12    |
| B         | 15        | 7     | 20           | 5     |
| C         | 24        | 5     | 20           | 9     |
| D         | 5         | 16    | 5            | 14    |

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33. From the following data relating to the value of sales and number of units sold, calculate Pearson's correlation coefficient.

|                    |   |    |    |    |    |    |    |    |    |    |    |
|--------------------|---|----|----|----|----|----|----|----|----|----|----|
| <b>Sales</b>       | : | 50 | 60 | 55 | 65 | 75 | 70 | 75 | 80 | 90 | 80 |
| <b>(Rs. Lakhs)</b> |   |    |    |    |    |    |    |    |    |    |    |
| <b>Units sold</b>  | : | 10 | 14 | 15 | 11 | 12 | 15 | 16 | 20 | 18 | 19 |
| <b>(in '000)</b>   |   |    |    |    |    |    |    |    |    |    |    |

34. Fit a straight line trend for the following series. Estimate the value for 2012 :

|                                |   |      |      |      |      |      |      |      |
|--------------------------------|---|------|------|------|------|------|------|------|
| <b>Year</b>                    | : | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
| <b>No. of Production units</b> | : | 125  | 128  | 133  | 135  | 140  | 141  | 143  |

35. Ten competitors in a beauty contest were ranked by three judges in the following orders :

|                    |   |   |   |   |    |   |    |   |    |   |   |
|--------------------|---|---|---|---|----|---|----|---|----|---|---|
| <b>Competitors</b> | : | A | B | C | D  | E | F  | G | H  | I | J |
| <b>Judge I</b>     | : | 1 | 6 | 5 | 10 | 3 | 2  | 4 | 9  | 7 | 8 |
| <b>Judge II</b>    | : | 3 | 5 | 8 | 4  | 7 | 10 | 2 | 1  | 6 | 9 |
| <b>Judge III</b>   | : | 6 | 4 | 9 | 8  | 1 | 2  | 3 | 10 | 5 | 7 |

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

**(2×15=30 Marks)**