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 **PRESIDENCY UNIVERSITY**

  **Bengaluru**

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| --- |
| **End - Term Examinations – JANUARY 2025** |
| **Date:** 02-01-2025 **Time:** 01:00 pm – 04:00 pm |

|  |  |
| --- | --- |
| **School:** SOL | **Program:** B.Com LL.B Hons |
| **Course Code:** BCL2003 | **Course Name:** Business Statistics |
| **Semester**: III | **Max Marks**:100 | **Weightage**:50% |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
| **Marks** | **10** | **20** | **20** | **20** | **30** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Do not write anything on the question paper other than roll number.*

**Part A**

|  |
| --- |
|  **Answer ALL the Questions. 10 x 2 Marks=20 Marks** |
| **1** | The following table gives height of boys and girls in a college.

|  |  |  |
| --- | --- | --- |
|  | **Boys**  | **Girls**  |
| Number Average height Variance  | 40068 inches 9 | 10065 inches 4 |

Whose height is more variable? | **2 Marks** | **L4** | **CO1** |
| **2** | Explain the concept of probable error in correlation?  | **2 Marks** | **L1** | **CO3** |
| **3** | What are the three types of Kurtosis? Draw the diagrams for each. | **2 Marks** | **L1** | **CO3** |
| **4** | List out any four properties of Normal Distribution. | **2 Marks** | **L1** | **CO3** |
| **5** | How Poisson distribution differs from Binomial Distribution? | **2 Marks** | **L2** | **CO3** |
| **6** | Draw diagrams of a perfect positive correlation and a perfect negative correlation. | **2 Marks** | **L1** | **CO3** |
| **7** | If Laspeyre's Price Index is 120 and Paasche's Price Index is 115, calculate Fisher's Price Index. | **2 Marks** | **L4** | **CO4** |
| **8** | Define the term 'moment' in statistics. | **2 Marks** | **L4** | **CO2** |
| **9** | What are Measures of Dispersion? Give two examples. | **2 Marks** | **L4** | **CO2** |
| **10** | Differentiate between Cyclical trend and seasonal variation. | **2 Marks** | **L1** | **CO3** |

**Part B**

|  |
| --- |
| **Answer the Questions Total 80 Marks** |
| **11.** | **a.** | Calculate the first four moments about the mean from the following data. Also calculate the value of β1 and β2:

|  |  |
| --- | --- |
| **Marks** | **No. of students** |
| 0-10 | 5 |
| 10-20 | 12 |
| 20-30 | 18 |
| 30-40 | 40 |
| 40-50 | 15 |
| 50-60 | 7 |
| 60-70 | 3 |

 |  **10 Marks** | **L4** | **CO3** |
| **or** |
| **12.** | **a.** | Calculate the mean deviation from the mean and means deviation from median for the following data**:**

|  |  |
| --- | --- |
| **Marks**  | **No. of students** |
| 0-10 | 6 |
| 10-20 | 5 |
| 20-30 | 8 |
| 30-40 | 15 |
| 40-50 | 7 |
| 50-60 | 6 |
| 60-70 | 3 |

 | **10****Marks** | **L4** | **CO3** |
|  |  |  |  |  |  |
| **13.** | **a.** | What do you understand by business statistics? Write its function & characteristics, also discuss its applicability in the area of Law. | **10 Marks** | **L1** | **CO1** |
| **or** |
| **14.** | **a.** | **Calculate mode from the following data.**

|  |  |
| --- | --- |
| **Height in inches**  | **No. of persons**  |
| **56** | **3** |
| **58** | **7** |
| **59** | **6** |
| **60** | **9** |
| **61** | **20** |
| **62** | **22** |
| **63** | **24** |
| **64** | **5** |
| **66** | **3** |
| **68** | **1** |

 | **10 Marks** | **L4** | **CO2** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **15.** | **a.** | Find the trend of the following time series by the method of moving averages (assume a four yearly cycle). Draw trend line and actual data line on graph and give sales prediction for the year 2026.

|  |  |
| --- | --- |
| **Year** | **sales** |
| 2010 | 53 |
| 2011 | 79 |
| 2012 | 76 |
| 2013 | 66 |
| 2014 | 69 |
| 2015 | 94 |
| 2016 | 105 |
| 2017 | 88 |
| 2018 | 80 |
| 2019 | 104 |
| 2020 | 98 |
| 2021 | 96 |
| 2022 | 102 |
| 2023 | 106 |

 | **10 Marks** | **L4** | **CO3** |
| **Or** |
| **16.** | **a.** | Fit a trend line by the method of semi-averages to the following data and give prediction for the year 2025.

|  |  |
| --- | --- |
| **Year** | **Production of Cars (in ‘000 units)** |
| 2010 | 17 |
| 2011 | 20 |
| 2012 | 19 |
| 2013 | 26 |
| 2014 | 24 |
| 2015 | 40 |
| 2016 | 35 |
| 2017 | 55 |
| 2018 | 50 |
| 2019 | 74 |
| 2020 | 69 |

 | **10 Marks** | **L4** | **CO3** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **17.** | **a.** | Calculate coefficient of correlation from the following data and comment on the result and with the help of probable error find out the significance of the result.

|  |  |
| --- | --- |
| **Experience (X)** | **Performance (Y)**  |
| 16 | 23 |
| 12 | 22 |
| 18 | 24 |
| 4 | 17 |
| 3 | 19 |
| 10 | 20 |
| 5 | 18 |
| 12 | 21 |

 | **15 Marks** | **L4** | **CO3** |
| **Or** |
| **18.** | **a.** | The following table gives the supply and price figures for a commodity for 6 days. Calculate correlation coefficient between price and supply.

|  |  |  |
| --- | --- | --- |
| **Days**  | **Price**  | **Supply**  |
| **Mon** | **22** | **10** |
| **Tue** | **30** | **12** |
| **Wed** | **25** | **15** |
| **Thu** | **20** | **20** |
| **Fri**  | **15** | **23** |
| **Sat**  | **8** | **28** |

 | **15 Marks** | **L4** | **CO3** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **19.** | **a.** | Given the following data for 10 commodities, calculate the following price index numbers: Laspeyre's, Paasche's, Fisher's, Bowley's, Marshall-Edgeworth's, and Walsch's. Show all steps clearly.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Commodity** | **Base Year Price**  | **Base Year Quantity** | **Current Year Price**  | **Current Year Quantity**  |
| A | 15 | 10 | 20 | 12 |
| B | 25 | 8 | 30 | 9 |
| C | 35 | 6 | 40 | 7 |
| D | 20 | 9 | 22 | 10 |
| E | 10 | 15 | 12 | 16 |
| F | 18 | 12 | 22 | 14 |
| G | 30 | 7 | 32 | 8 |
| H | 25 | 10 | 28 | 11 |
| I | 40 | 5 | 45 | 6 |
| J | 50 | 4 | 55 | 5 |

 |

 | **15 Marks** | **L4** | **CO3** |
| **Or** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **20.** | **a.** | Using the following data for X (independent variable) and Y (dependent variable), calculate the regression equation Y = a + Bx.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **X** | **2** | **5** | **7** | **10** | **12** | **15** | **18** | **20** | **25** | **30** |
| **y** | **5** | **9** | **11** | **15** | **18** | **22** | **25** | **28** | **34** | **40** |

 | **15 Marks** | **L4** | **CO3** |
|  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **21.** | **a.** | Calculate Mean, median, mode and Standard Deviation of the following data.

|  |  |
| --- | --- |
| **Class** | **frequency** |
| 0-20 | 32 |
| 20-40 | 16 |
| 40-60 | 13 |
| 60-80 | 10 |
| 80-100 | 19 |

 | **5X4=20 Marks** | **L4** | **CO2** |
| **Or** |
| **22.** | **a.** | Using this data, calculate the price index numbers using the following methods: Laspeyre's, Paasche's, Fisher's, Bowley's, Marshall-Edgeworth's, and Walsch's. Ensure all calculations are shown step-by-step.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Commodity** | **2022** **Price**  | **2022****Quantity**  | **2023** **Price**  | **2023** **Quantity**  |
| Rice | 18 | 12 | 24 | 14 |
| Wheat | 22 | 15 | 28 | 16 |
| Sugar | 30 | 10 | 36 | 12 |
| Oil | 25 | 8 | 30 | 9 |
| Salt | 12 | 20 | 15 | 22 |
| Tea | 40 | 5 | 48 | 6 |
| Coffee | 35 | 9 | 42 | 10 |
| Milk | 28 | 11 | 34 | 13 |
| Eggs | 50 | 7 | 60 | 8 |
| Butter | 45 | 6 | 55 | 7 |

 | **20 Marks** | **L4** | **CO4** |

**\*\*\*\*\* BEST WISHES \*\*\*\*\***