**SYBCOM Semester End Assessment (Regular/Repeat)**

November 2022

**Course Title: BUSINESS STATISTICS - I**

**Course Code: UCAG101** **Category: GE** **Semester: I**

**Duration: 2 hrs** **Max Marks: 80**

**Instructions:**

1. The question paper contains 5 main questions spread across 4 pages.
2. All the questions are compulsory however internal choice is available.
3. Use of calculator is allowed.
4. Figures to the right indicate marks allotted.
5. You may answer randomly but every main question attempted should be answered serially.

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**Q1)** a. State any three functions of statistics. **(3)**

b. Draw a more than ogive for the following data: **(6)**

| Class interval | 0 – 10 | 10 – 20 | 20 – 30 | 30 – 40 | 40 – 50 |
|---|---|---|---|---|---|
| Frequency | 12 | 14 | 11 | 5 | 10 |

c. The following table is the distribution of marks of 100 students of a class. Prepare a cumulative frequency table and answer the questions given below: **(7)**

| Marks obtained | Number of students |
|---|---|
| 0 – 20 | 14 |
| 20 – 40 | 16 |
| 40 – 60 | 25 |
| 60 – 80 | 35 |
| 80 – 100 | 10 |

I. How many students have scored less than 60 marks?
II. How many students have got at least 40 marks?
III. If the passing marks are 40, how many students have failed in the examination?
IV. How many students have got marks between 20 and 80?

**OR**

**QI)** p. State any three limitations of statistics. **(3)**

q. From the following data construct a frequency curve: **(6)**

| Wages (in Rs.) | 100-120 | 120-140 | 140-160 | 160-180 | 180-200 |
|---|---|---|---|---|---|
| No. of workers | 14 | 15 | 18 | 6 | 17 |

r. Following are the runs scored by two batsmen in 20 matches. Taking class intervals as 0-20, 20-40, and so on for both x and y, construct a bivariate frequency table. Also find the conditional frequency distribution for x when y > 40. **(7)**

*(10, 25) (25, 32) (68, 32) (76, 42) (45, 45) (38, 18) (25, 46) (56, 72) (82, 47) (56, 75) (77, 55) (17, 71) (45, 56) (88, 92) (25, 64) (55, 77) (42, 50) (30, 60) (55, 69) (28, 35)*

**Q2)** a. State the properties of an ideal average. **(3)**

b. Calculate median for the data that shows the daily wages of a random sample of construction workers: **(6)**

| Class interval | 400 – 450 | 450 – 500 | 500 – 550 | 550 – 600 | 600 – 650 |
|---|---|---|---|---|---|
| Frequency | 5 | 15 | 25 | 18 | 7 |

c. Find the arithmetic mean for the data given below: **(7)**

| Variable (x) | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
|---|---|---|---|---|---|---|---|
| Frequency | 11 | 22 | 44 | 77 | 55 | 33 | 11 |

**OR**

**QII)** p. Calculate Geometric mean and harmonic mean for the data: 10, 20, 40 **(3)**

q. Calculate third quartile for the data given below: **(6)**

| Class interval | 0 – 10 | 10 – 20 | 20 – 30 | 30 – 40 | 40 – 50 |
|---|---|---|---|---|---|
| Frequency | 6 | 14 | 16 | 27 | 12 |

r. find the missing frequency from the following data if median is 126. **(7)**

| Class interval | 100 – 110 | 110 – 120 | 120 – 130 | 130 – 140 | 140 – 150 |
|---|---|---|---|---|---|
| Frequency | 5 | F | 20 | 10 | 7 |

**Q3)** a. The mean height of 25 male workers in a factory is 161 cms and that of 35 female workers is 158 cms. Find the combined mean height of 60 workers in a factory. **(3)**

b. Find mean deviation from mode and its coefficient for the following data: **(6)**

| Frequency | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|
| No. of students | 8 | 12 | 20 | 10 | 7 |

c. Calculate quartile deviation for wages: **(7)**

| Wages (in '000 ₹) | 30 – 32 | 32 – 34 | 34 – 36 | 36 – 38 | 38 – 40 |
|---|---|---|---|---|---|
| No. of Labourers | 12 | 18 | 16 | 14 | 12 |

**OR**

**QIII)** p. Find the coefficient of variation of a frequency distribution given that its mean is 120, mode is 123 and Karl Pearson's coefficient of skewness is " – 3". **(3)**

q. Find Karl Pearson's measure of skewness for the data: **(6)**

| Age | 10 – 15 | 15 – 20 | 20 – 25 | 25 – 30 | 30 – 35 |
|---|---|---|---|---|---|
| No. of people | 16 | 30 | 45 | 62 | 32 |

r. Calculate Bowley's coefficient of skewness for the following data: **(7)**

| Class interval | 20 – 28 | 28 – 36 | 36 – 44 | 44 – 52 | 52 – 60 |
|---|---|---|---|---|---|
| Frequency | 18 | 25 | 10 | 5 | 2 |

**Q4)** a. State different types of index numbers. **(3)**

b. From the following data, calculate weighted aggregative price index number: **(6)**

| Commodity | Price | | Weight |
|---|---|---|---|
| | Base Year | Current Year | |
| A | 10 | 25 | 5 |
| B | 12 | 32 | 7 |
| C | 14 | 39 | 6 |
| D | 18 | 55 | 10 |

c. For the data given below, calculate $L_p$, $P_p$ and $F_p$: **(7)**

| Commodity | Base Year | | Current Year | |
|---|---|---|---|---|
| | Price | Quantity | Price | Quantity |
| A | 6 | 50 | 10 | 56 |
| B | 2 | 10 | 2 | 120 |
| C | 4 | 60 | 6 | 60 |
| D | 10 | 30 | 12 | 24 |

**OR**

**QIV)** p. State uses of index number. **(3)**

q. Construct the cost of living index number for the data given below: **(6)**

| Commodity | Price | | Weight |
|---|---|---|---|
| | Base Year | Current Year | |
| A | 25 | 35 | 25 |
| B | 13 | 21 | 15 |
| C | 50 | 70 | 10 |

r. Calculate cost of living index number using aggregative expenditure method: **(7)**

| Commodity | Base Year | | Current Year | |
|---|---|---|---|---|
| | | Quantity | Price | Quantity |
| A | 5 | 50 | 4 | 48 |
| B | 8 | 48 | 7 | 49 |
| C | 6 | 18 | 5 | 20 |

Q5) a. State different methods of data collection. **(3)**

b. Draw a free hand curve showing the trend for the following data. **(6)**

| Year | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|
| Production (in lakhs) | 77 | 88 | 94 | 85 | 91 | 98 | 90 |

c. Fit a trend line to the following data by the method of least squares and hence estimate the sales in 2022: **(7)**

| Year | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| Sales (in '000 Rs.) | 18 | 21 | 23 | 27 | 16 | 25 |

**OR**

**QV)** p. Define data. Explain types of data. **(3)**

q. Apply the method of semi-averages for determining the trend of the following data and hence estimate the value for 2023. **(6)**

| Year | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|
| Sales (thousands units) | 34 | 38 | 36 | 42 | 45 | 44 |

r. Compute the trend values by using a 3-yearly moving average method. **(7)**

| Year | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|
| Index Number | 100 | 80 | 104 | 110 | 120 | 112 | 116 |

**********All The Best**********