Printed Pages : 6

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MAM-203

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 293210

Roll No.

# MAM (Sem.-II)

# THEORY EXAMINATION, 2014-15

# BUSINESS STATISTICS

*Time : 3 Hours]* *[Total Marks : 100*

**Note:** Attempt question as paper instruction given in each section.

## Section – A

1. Attempt any four parts in this section : 5×4=20

(a) What is the meaning of statistics? Write its importance.

(b) What do you mean by measures of central tendency?

(c) What do you mean by regression? Write its application.

(d) What do you mean by coefficient of variation? Write its limitations.

(e) What is the meaning of operation research? Write scope of operation research.

(f) What do you mean by scheduling? Write steps in scheduling.

## Section – B

2. Attempt any three parts of the following : 10×3=30

(a) Calculate the mean, median and mode from the following data :

| Value (Rs.) | f | Value (Rs). | f |
|---|---|---|---|
| 10-20 | 4 | 10-60 | 124 |
| 10-30 | 16 | 10-70 | 137 |
| 10-40 | 56 | 10-80 | 146 |
| 10-50 | 97 | 10-90 | 150 |

(b) Calculate Karl Pearson's coefficient of correlation between X and Y series by direct method :

| X: | 17 | 18 | 19 | 19 | 20 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|
| Y: | 12 | 16 | 14 | 11 | 15 | 19 | 22 | 15 | 20 |

And also define its degree.

Five men are available to do five different jobs. From fast record, the time (in hours) that each man takes to do each job is known and is given in the following table:

| | | Job | | | | |
|---|---|---|---|---|---|---|
| | | I | II | III | IV | V |
| Man | 1 | 2 | 9 | 2 | 7 | 1 |
| | 2 | 6 | 8 | 7 | 6 | 1 |
| | 3 | 4 | 6 | 5 | 3 | 1 |
| | 4 | 4 | 2 | 7 | 3 | 1 |
| | 5 | 5 | 3 | 9 | 5 | 1 |

Find the assignments of men to jobs that will minimize the total time taken.

7. Calculate S.D. and coefficient of variation of the following frequency distribution :

| Marks Obtained | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 |
|---|---|---|---|---|---|---|---|---|
| No. of Students | 5 | 10 | 20 | 40 | 30 | 20 | 10 | 5 |

**OR**

Solve the following LPP by graphical method :

Max.$Z = x_1 + x_2$

Subject to,

$-2x_1 + x_2 \leq 1$

$x_1 \leq 2$

$x_1 + x_2 \leq 3$

$x_1, x_2 \geq 0$

—x—



(c) Solve the following Linear programming problem by simplex method :

Max. $Z=3x_1+5x_2+4x_3$

Subject to,

$2x_1+3x_2 \leq 8$

$2x_2+5x_3 \leq 10$

$3x_1+2x_2+4x_3 \leq 15$

$x_1, x_2, x_3 \geq 0$

(d) Solve the following transportation problem by VAM:

| | $W_1$ | $W_2$ | $W_3$ | Availability/Supply |
|---|---|---|---|---|
| $F_1$ | 2 | 7 | 4 | 5 |
| $F_2$ | 3 | 3 | 1 | 8 |
| $F_3$ | 5 | 4 | 7 | 7 |
| $F_4$ | 1 | 6 | 2 | 14 |
| Demand | 7 | 9 | 18 | |

(e) Solve the following assignment problem :

| | I | II | III | IV | V |
|---|---|---|---|---|---|
| A | 5 | 11 | 10 | 12 | 4 |
| B | 2 | 4 | 6 | 3 | 5 |
| C | 3 | 12 | 5 | 14 | 6 |
| D | 6 | 14 | 4 | 11 | 7 |
| E | 7 | 9 | 8 | 12 | 5 |

## Section – C

Attempt all questions in this sections : 10×5=50

3. Calculate mean from the following data :

| Salary (RS.) | Frequency |
|---|---|
| Below 50 | 30 |
| Below 70 | 46 |
| Below 100 | 65 |
| Below 110 | 85 |
| Below 120 | 95 |
| Above 120 | 5 |

OR

Find out mode from the following data :

| Height (in cms.): | 120-124 | 125-129 | 130-134 | 135-139 | 140-144 | 145-149 | 150-154 |
|---|---|---|---|---|---|---|---|
| No. of Students : | 2 | 5 | 8 | 15 | 25 | 10 | 5 |

4. Find the two regression lines from the following data :

| X: | 11 | 14 | 14 | 17 | 17 | 21 | 25 |
|---|---|---|---|---|---|---|---|
| Y: | 15 | 27 | 27 | 30 | 34 | 38 | 46 |

Also estimate the value of Y for X = 30.

**OR**

From the following data relating to sales and net profits of a firm find the rank correlation coefficient.

| Sales in Rs. | 60 | 80 | 90 | 60 | 100 | 130 | 120 | 110 |
|---|---|---|---|---|---|---|---|---|
| Profit in Rs. | 30 | 40 | 50 | 40 | 60 | 70 | 40 | 75 |



5. Solve the following linear programming problem by Big-M method:

Min. $Z = 5x_1 + 3x_2$

Subject to,

$$2x_1 + 4x_2 \leq 12$$
$$2x_1 + 2x_2 = 10$$
$$5x_1 + 2x_2 \geq 10$$
$$x_1, x_2 \geq 0$$

**OR**

Using the dual, solve the following LPP :

Min. $Z = 2x_2 + 5x_3$

Subject to,

$$x_1 + x_2 \geq 2$$
$$2x_1 + x_2 + 6x_3 \leq 6$$
$$x_1 - x_2 + 3x_3 = 4$$
$$x_1, x_2, x_3 \geq 0$$

6. A company has four plants P1, P2, P3, P4 from which it supplies to three markets M1, M2, M3. Determine the optimal transportation plan from the following data giving the plant to market shifting costs, quantities available at each plant and quantities required at each market.

| Market | Plant | | | | Required |
|---|---|---|---|---|---|
| | $P_1$ | $P_2$ | $P_3$ | $P_4$ | at market |
| $M_1$ | 19 | 14 | 23 | 11 | 11 |
| $M_2$ | 15 | 16 | 12 | 21 | 13 |
| $M_3$ | 30 | 25 | 16 | 39 | 19 |
| Available at Plant | 6 | 10 | 12 | 15 | 43 |

**OR**