

Roll No.

Total No. of Pages : 04

Total No. of Questions : 17

**MBA / MBA (IB) (Sem.-1)**  
**QUANTITATIVE TECHNIQUES**

Subject Code : MBA-103-18

M.Code : 75404

Date of Examination : 20-05-2023

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTION TO CANDIDATES :**

1. SECTION-A contains EIGHT questions carrying TWO marks each and students has to attempt ALL questions.
2. SECTION-B consists of FOUR Subsections : Units-I, II, III & IV. Each Subsection contains TWO questions each carrying EIGHT marks each and student has to attempt any ONE question from each Subsection.
3. SECTION-C is COMPULSORY carrying TWELVE marks.

**SECTION-A**

**Write Short notes on :**

1. Statistics in Plural sense
2. Geometric Mean
3. Range
4. Regression Coefficient
5. Poission Distribution
6. Vogel's Approximation Method or Transportation
7. CPM
8. Duality.

## SECTION-B

### UNIT-I

9. Define statistics. Distinguish between descriptive and inferential statistics.
10. The sales report of a company selling power generators, reveals the following:

*“The average number of generators sold in the past 20 weeks is 24. The best five weeks averaged sale of 35 generators while the worst five weeks had sales of 7, 8, 10, 12 and 14 generators.”* You are required to :

- a) Find the average sales of remaining five weeks.
- b) Determine the number of generators needed to be sold in the 21st Week so that the overall average becomes 25 sets.

### UNIT-II

11. a) A husband and wife appear in an interview for two vacancies for the same post. The probability of the husband's selection is  $\frac{1}{7}$  and that of wife's selection is  $\frac{1}{5}$ . What is the probability that? Both of them will be selected, only one of them will be selected and none of them will be selected.
  - b) An unbiased die and a biased die are tossed together. Find the probability that the sum of the digits obtained on them is even, given that on the biased die, it is thrice as likely to show an even number as an odd one when tossed once.
12. Explain different types of correlation. Elaborate different methods of calculation of correlation coefficient by giving suitable examples.

### UNIT-III

13. Anita Electric Company produces two products P1 and P2. Products are produced and sold on a weekly basis. The weekly production cannot exceed 25 for product P1 and 35 for product P2 because of limited available facilities. The company employs total of 60 workers. Product P1 requires 2 man-weeks of labour, while P2 requires one man-week of labour. Profit margin on P1 is Rs. 60 and on P2 is Rs 40. Formulate this problem as an LP problem and solve that using graphical method.
14. Which competitive situation is called a game? What is the maximin criterion of optimality? What are the assumptions made in the theory of games?

## UNIT-IV

15. The following table gives the cost of transporting material from supply points A, B, C and D to demand points E, F, G, H and I.

|      |   | TO |    |    |    |    |
|------|---|----|----|----|----|----|
|      |   | E  | F  | G  | H  | I  |
| FROM | A | 8  | 10 | 12 | 17 | 15 |
|      | B | 15 | 13 | 18 | 11 | 9  |
|      | C | 14 | 20 | 6  | 10 | 13 |
|      | D | 13 | 19 | 7  | 5  | 12 |

The present allocation is as follows :

A to E 90; A to F 10; B to F 150; C to F 10; C to G 50; C to I 120; D to H 210; D to I 70.

- a) Check if this allocation is optimum. If not, find an optimum schedule.
- b) If in the above problem, the transportation cost from A to G is reduced to 10, what will be the new optimum schedule?
16. How does the PERT technique help a business manager in decision-making? Critically comment on the assumptions that are made for PERT/ CPM analysis of projects.

### SECTION-C

17. **Case Study :**

Shreya Advertisers – a marketing company dealing with laminated sheets ‘Gloss’ in the western zone covering Maharashtra, Gujarat and Madhya Pradesh, is considering to launch an advertisement campaign within a budget of Rs. 2.5 lakh. On the basis of advertisement testing of the previous year, the company’s research department has found that magazines and films are the ideal media for advertising laminated sheets. The company is not in a position to use the audiovisual medium due to limitation of funds. The magazine’s enjoying good recall in last year’s campaign are *Stardust*, *Filmfare*, *Reader’s Digest* and *Madhuri*. This is attributed to the effective visual impact made by the good reproduction of the advertisements both in colour and black & white.

The characteristics of target audience for ‘Gloss’ and weightage of each characteristics are as follows :

|                       | Characteristics | Weightage |
|-----------------------|-----------------|-----------|
| <b>Age</b>            | 15 – 34 years   | 20        |
| <b>Monthly income</b> | Over Rs. 5,000  | 70        |
| <b>Education</b>      | Above S.S.C     | 10        |

The audience characteristics for the four magazines selected are given below :

| Characteristics                        | Stardust (%) | Filmfare (%) | Readers's Digest (%) | Madhuri (%) |
|--|--------------|--------------|----------------------|-------------|
| <b>Age : 15 – 34 years</b>             | 75           | 45           | 56                   | 80          |
| <b>Monthly Income : Over Rs. 5,000</b> | 52           | 43           | 47                   | 25          |
| <b>Education : Above S.S.C</b>         | 83           | 53           | 72                   | 34          |

The efficiency index for a black and white advertisement may be taken as 0.15 and that for a colour advertisement as 0.20. The cost per insertion of a black and white , and a colour advertisement and the readership for the four magazines are as follows :

| Magazines                        | Cost (per Insertion) |        | Readership (in '000 Rs.) |
|----------------------------------|----------------------|--------|--------------------------|
|                                  | Black & White        | Colour |                          |
| <b>Stardust (Monthly)</b>        | 4,500                | 8,400  | 189                      |
| <b>Filmfare (Fortnightly)</b>    | 4,200                | 8,400  | 256                      |
| <b>Reader's Digest (Monthly)</b> | 6,400                | 9,600  | 136                      |
| <b>Madhuri (Fortightly)</b>      | 3,300                | 6,600  | 205                      |

It has also been found that for creating atleast 03 insertions are necessary in Stardust and Reader's Digest, While a minimum of 04 insertions will be required in case of Filmfare.

**Question :**

Suggest an advertising strategy for the company to maximize the expected effective exposure.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**