**OPERATIONS RESEARCH QUESTION BANK**

**Short Answer type Questions**

1**.** A Farmer wants to decide which of three crops he should plant on his 100 Acre farm. The profit from each is dependent on the rainfall during the growing season. The farmer has categorized the amount of rainfall as high, medium and low. His estimate profit for each crop is shown in the table below

Estimated conditional profit in $

|  |  |  |  |
| --- | --- | --- | --- |
| Rainfall |  |  |  |
|  | Crop A | Crop B | Crop C |
| HIGH | 8000 | 3500 | 5000 |
| MEDIUM | 4500 | 4500 | 500 |
| LOW | 2000 | 5000 | 4000 |
|  |  |  |  |

If farmer wishes to plant only one crop, decide which should be his best crop using

1. Maximax criterion. B) Maximin criterion.

2**.** Process of Decision making analysis.

3. Characteristics of Graphical Method.

4. Solve the Criterion of Optimism. Determine the best possible outcome in each strategy and then identify the best of the best outcome in order to select the optimal strategy.

|  |  |  |  |
| --- | --- | --- | --- |
| **STRATEGIES** | **N1** | **N2** | **N3** |
| **S1** | **15** | **12** | **18** |
| **S2** | **09** | **14** | **10** |
| **S3** | **13** | **04** | **26** |

5. Solve the Criterion of Regret. Determine the best possible outcome.

|  |  |  |  |
| --- | --- | --- | --- |
| STRATEGIES | N1 | N2 | N3 |
| S1 | 15 | 12 | 18 |
| S2 | 09 | 14 | 10 |
| S3 | 13 | 04 | 26 |

6. Solve the Transportation model with the unbalanced(dummy).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | W1 | W2 | WD3 | W4 | Availability |
| F1 | 19 | 30 | 50 | 10 | 7 |
| F2 | 70 | 30 | 40 | 60 | 9 |
| F3 | 40 | 80 | 70 | 20 | 18 |
| Requirement | 5 | 8 | 7 | 10 |  |

7. From the Transportation Model solve the IBFS with the Least cost method.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | D1 | D2 | D3 | Availability |
| O1 | 2 | 3 | 5 | 60 |
| O2 | 4 | 6 | 7 | 70 |
| O3 | 3 | 5 | 2 | 20 |
| O4 | 1 | 4 | 6 | 40 |
| Requirement | 50 | 40 | 100 |  |

8. Objectives of the Operations research.

9. A Farmer wants to decide which of three crops he should plant on his 100 Acre farm. The profit from each is dependent on the rainfall during the growing season. The farmer has categorized the amount of rainfall as high, medium and low. His estimate profit for each crop is shown in the table below

Estimated conditional profit in $

|  |  |  |  |
| --- | --- | --- | --- |
| Rainfall |  |  |  |
|  | Crop A | Crop B | Crop C |
| HIGH | 8000 | 3500 | 5000 |
| MEDIUM | 4500 | 4500 | 500 |
| LOW | 2000 | 5000 | 4000 |
|  |  |  |  |

If farmer wishes to plant only one crop, decide which should be his best crop using

A) Maximax criterion. B) Maximin criterion.

10. Process of the Decision Analysis.

11. Find the Initial Basic Feasible Solution (IBFS) for the following Transportation model by North West Corner (NWC) method.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | D1 | D2 | D3 | D4 | Availability |
| O1 | 8 | 6 | 7 | 1 | 70 |
| O2 | 2 | 3 | 4 | 5 | 20 |
| O3 | 9 | 2 | 9 | 1 | 10 |
| Requirement | 10 | 10 | 10 | 70 |  |

12. Find the Initial Basic Feasible Solution (IBFS) for the following Transportation model by least cost method.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | D1 | D2 | D3 | D4 | Availability |
| O1 | 1 | 2 | 3 | 4 | 30 |
| O2 | 2 | 3 | 5 | 6 | 40 |
| O3 | 7 | 5 | 3 | 4 | 30 |
| Requirement | 40 | 30 | 10 | 20 |  |

13. Describe the Linear Programming Graphical method.

**One Sentence/Paragraph Answer type Questions**

A) Write the formula of North West Corner model from the Transportation model.

B).Process of Decision making.

C). Definition of Operations Research and Decision making analysis.

D). who are the main contributors for the development of Operations Research.

**Essay Answer type Questions**

1. Find the Initial Basic Feasible Solution (IBFS) for the following Transportation model by North West Corner (NWC) method.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | D1 | D2 | D3 | D4 | Availability |
| O1 | 8 | 6 | 7 | 1 | 70 |
| O2 | 2 | 3 | 4 | 5 | 20 |
| O3 | 9 | 2 | 9 | 1 | 10 |
| Requirement | 10 | 10 | 10 | 70 |  |

2. .Find the Initial Basic Feasible Solution (IBFS) for the following Transportation model by least cost method.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | D1 | D2 | D3 | D4 | Availability |
| O1 | 1 | 2 | 3 | 4 | 30 |
| O2 | 2 | 3 | 5 | 6 | 40 |
| O3 | 7 | 5 | 3 | 4 | 30 |
| Requirement | 40 | 30 | 10 | 20 |  |

3. From the Linear Programming problem solve the given equation by the graphical presentation.

Maximize Z=12x1 + 16x2

10x1+20x2 lesser than 120

8x1+ 8x2 lesser than 80

X1+x2 greater than 0.

4. Solve the problem from the Transportation Model with the North West Corner method.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | D1 | D2 | D3 | D4 | Availability |
| O1 | 6 | 7 | 8 | 9 | 60 |
| O2 | 7 | 8 | 5 | 6 | 20 |
| O3 | 4 | 3 | 2 | 7 | 20 |
| Requirement | 20 | 40 | 20 | 20 |  |

5. Solve the Criterion of Equal Probability.

Events in $

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Strategies | W | X | Y | Z |
| A | 4000 | -100 | 6000 | 18000 |
| B | 20000 | 5000 | 400 | 0 |
| C | 20000 | 15000 | -2000 | 1000 |

6. Describe the Historical movement of Operations Research.

7. Solve the Criterion of Equal Probability from the following question.

STATE OF NATURE

|  |  |  |  |
| --- | --- | --- | --- |
| STRATEGY | N1 | N2 | N3 |
| S1 | 15 | 12 | 18 |
| S2 | 9 | 14 | 10 |
| S3 | 13 | 4 | 26 |

8. Objectives of Operations Research.