**B.Sc. DEGREE EXAMINATION, NOVEMBER 2016.**

**II YEAR — IV SEMESTER**

**Major Paper VIII — OPERATIONS RESEARCH-I**

**Time : 3 hours Max. Marks : 60**

**SECTION A — (10 × 1 = 10 marks)**

**Answer any *TEN* questions.**

1. Write the advantages of model.
2. Define decision variables.
3. State the different states of nature for decision making under the uncertainty.
4. Specify the real time example for decision making.
5. Define decision tree.
6. Mention the advantages of decision tree analysis.
7. Find the saddle point

 Player B

|  |  |  |  |
| --- | --- | --- | --- |
| 12 | 1 | 30 | -10 |
| 20 | 3 | 10 | 5 |
| -5 | -2 | 25 | 0 |
| 15 | -4 | 10 | 6 |

 Player B

1. State zero sum game.
2. What is meant by mixed strategy game.
3. Define total elapsed time.
4. What is meant by processing order?
5. Define optimum strategy.

**SECTION B — (5 × 4 = 20 marks)**

**Answer any *FIVE* questions.**

1. Formulate the following as LPP

Product : A B C

Platinum(gms) : 2 4 6

Gold (gms) : 3 2 4

Profit (`) : 500 600 1200

Daily allotment of Platinum and gold is 160gms and 120gms respectively.

1. Find the optimum number of items per week should the industry produce. Given that cost of making an item in `25 and selling price is `30, if sold within a week and it could be disposed at `20 per item at the end of the week

Weekly sales : ≤ 3 4 5 6 7 ≥8

No. of weeks : 0 10 20 40 30 0

1. Write down the rules of drawing a decision tree.
2. Determine the sequence for the 5 jobs that will minimise the total elapsed time:

Jobs : 1 2 3 4 5

MA : 10 2 18 6 20

MB  : 4 12 14 16 8

1. Find optimum sequence for the jobs on 3 machines:

Jobs : 1 2 3 4 5 6 7

M1 : 4 9 8 5 10 9 8

M2  : 5 4 3 6 2 5 4

M3  : 7 8 6 12 6 7 13

[P.T.O.]

1. Solve the game :

 Player B

 Player A $\left(\begin{matrix}3&-2\\-2&5\end{matrix}\right)$

1. Using Dominance property solve the game

 Player B

|  |  |  |  |
| --- | --- | --- | --- |
| 8 | 10 | 9 | 14 |
| 10 | 11 | 8 | 12 |
| 13 | 12 | 14 | 13 |
|  |  |  |  |

 Player B

**SECTION C — (3 × 10 = 30 marks)**

**Answer any *THREE* questions.**

1. Solve the following LPP.

Max *Z=6x1+4x2*

 Subject to the constraints *2x1+ x2 ≤390,*

 *3 x1+3 x2 ≤810,*

 *x2 ≤200,*

 *x1, x2 ≥ 0*

1. The probability distribution of monthly sales of an item is as follows:

Monthly Sales : 0 1 2 3 4 5 6

Probability : 0.01 0.06 0.25 0.30 0.22 0.10 0.06

The cost of carrying inventory is `30 per Unit per month and the Unit Shortage is `70. Determine optimum stock to minimize expected.

22. Explain in detail the following:

1. Hurwicz criterion
2. Laplace criterion.

23. Solve the following game by graphical method

 Player B

|  |  |  |  |
| --- | --- | --- | --- |
| 3 | -1 | 1 | 2 |
| -2 |  3 | 2 | 3 |
| 2 | -2 | -1 | 1 |
|  |  |  |  |

 Player A

24. Solve the following sequencing problem of jobs on six machines *Mj, j=1,2,3,4,5* and *6* in

 the order *M1M2M3M4 M5M6*. Processing times are given below:

 Machine

 Job M1 M2 M3 M4 M5 M6

 A 18 8 7 2 10 25

 B 17 6 9 6 8 19

 C 11 5 8 5 7 15

 D 20 4 3 4 8 12

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