**ST. JOSEPH’S UNIVERSITY, BENGALURU -27**

Registration Number:

Date & Session

**M.COM– II SEMESTER**

**SEMESTER EXAMINATION: APRIL 2024**

**(Examination conducted in May/June 2024)**

**MCO8320 – OPERATIONS RESEARCH**

**(For current batch students and for reg no starting with 22)**

**Time: 2 Hours Max Marks: 50**

**This paper contains \_2\_ printed pages and 3 parts**

**PART-A**

**Answer any TWO Questions (2\*5=10).**

1.Draw a network diagram from the following information if A and B are the starting activities

|  |  |
| --- | --- |
| Preceding Activity | Succeeding activity |
| A | C |
| A | D |
| A | E |
| B,C | F |
| D | G |
| E,F,G | H |

2.Explain the main features of OR

3.Find u and v Values from the following. (Use NWCM for Basic Feasible Solution)



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | D1 | D2 | D3 | Supply |
| F1 | 12 | 6 | 16 | 55 |
| F2 | 10 | 4 | 2 | 85 |
| F3 | 8 | 4 | 4 | 80 |
| Demand | 68 | 106 | 46 | 220 |

**Part B**

**Answer any TWO Questions (2\*15=30).**

4.Super Fast Co has 5 plants each of which can manufacture any one of the five products. The profit details are given below. Find the optimal Solution to assign the products to the plants.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Product P | Product Q | Product R | Product S | Product T |
| Plant1 | 32 | 38 | 40 | 28 | 50 |
| Plant 2 | 40 | 24 | 28 | 21 | 36 |
| Plant 3 | 41 | 27 | 33 | 35 | 37 |
| Plant 4 | 22 | 38 | 41 | 46 | 36 |
| Plant 5 | 29 | 33 | 40 | 35 | 39 |

5. a. Expand EVPI, EPPI, EOL AND EMV**(5m)**

b. A shop keeper prepares Food at a total average cost of Rs.4 per plate and sells it at a price of Rs.6. The food is prepared in the morning and is sold during the same day. Unsold food is spoiled and should be thrown away. According to the past sale number of plates is not less than 20 or greater than 23. Prepare the Payoff table, regret table**. (10m)**

1. Consider the following table:

**Time in weeks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Activity** | **Predecessor Activity** | **Optimistic (to)** | **Most likely (tm)** | **Pessimistic (tp)** |
| A  B  C  D  E  F  G | -  -  A  A  B  C  D, E | 2  2  1  4  4  3  1 | 3  3  2  6  5  4  1 | 10  4  3  14  12  5  7 |

Find out the critical path, head and tail slack, total and independent floats.

**Part C**

**Answer the following Question (10\*1=10).**

7. a. Explain the key elements in Decision making**. (5m)**

b.Find the dual of the following(**5 m)**

Minimise Z=2X1+X2+2Z

Sub to:

3X1+X2 +Z ≥ 3

4X1+3X2+Z ≥ 6

X1+2X2 ≤ 3

Where X1 and X2 ≥ 0 and Z is unrestricted.