

MASTER OF ENGINEERING IN PRODUCTION ENGINEERING
EXAMINATION, 2018

(1st Year, 1st Semester)

QUANTITATIVE METHODS & DECISION THEORIES IN
MANAGEMENT

Time : Three hours

Full Marks : 100

Answer *any five* questions

1. a) Explain Silver-Meal Heuristic with an example known to you. 10
b) Show and discuss taxonomy of MADM. 10
2. Elucidate the procedural steps for TOPSIS through a suitable example. 20
3. a) Write notes on the following :
 - i) Yager algorithm
 - ii) Capacity Planning
 - iii) Tracking signal
 - iv) MAD16
- b) What is reduced cost ? 4
4. Given : Maximize $Z = 40x_1 + 35x_2$ (pn/st)

Subject to

[2]

$$2x_1 + 3x_2 \geq 60 \text{ (raw material constraints)}$$

$$4x_1 + 3x_2 \leq 96 \text{ (Labour Hours Constraints)}$$

$$4x_1 + 3 \cdot 5x_2 \leq 105 \text{ (Packing hours constraints)}$$

$$x_1, x_2 \geq 0$$

Show graphically :

a) Changes in the available resources with your comments. 10

b) Changes in the objective function co-efficients with your comments. 10

5. How is ELECTRE approach used in decision theory ? Explain with illustration. 20

6. a) Fit a linear regression model for forecasting the sales of the given data :

variable A	variable B	sales
150	12	82
170	15	105
125	39	97
96	57	123
180	63	179
130	40	68

[3]

b) What is MAPE ? 18+2=20

7. Expound Analytic Hierarch Process (AHP) with an example known to you. Also use QFD to support your understanding in order to infer final decision of the said example. 20

8. Write short notes on *any two* :

a) Shadow price

b) Transportation problem

c) Degeneracy

d) Saddle point

e) Co-efficient of optimism. 10×2=20