MAHARISHI UNIVERSITY OF MANAGEMENT AND TECHNOLOGY

MAHARISHI ROAD, MANGLA, BILASPUR (CHHATTISGHAR)-495001

FINAL EXAM : SEMESTER-II, SESSION 2021-22

COURSE –MBA, PAPER –V , SUBJECT CODE – MBA205

SUBJECT – OPERATIONS RESEARCH

Max Marks : 70 **Min Pass Marks : 28**

- All questions are compulsory.
- Be precise in your answers**.**

Que 1 Multiple choice: Read the following questions carefully and choose the suitable answer: 10X1=10

(i) Operation Research is the application of _____ methods to arrive at the optimal.

A. Solutions to the problem
B. Economical
C. Scientific
D. a and b both artistic

(ii) Who defined OR as scientific method of providing executive department with a quantitative basis for decisions regarding the operations under their control?

A. Morse and Kimball (1946)
B. PMS Blacket
C. E L Arnoff and M J Netzorg
D. None of these

(iii) Term "Linear" in LPP represents that

A. Parameters value remains constant during the planning period
B. Value of decision variables is non-negative
C. Relationship among all variables is linear
D. It has single objective function & constraints

(iv) **The first step in formulating a linear programming problem is**

A. Plot a graph
B. Perform the sensitivity analysis
C. Identify and define the decision variables
D. Find out the redundant constraints

(v) Vogel's approximation method is connected with

A. Assignment Problem
B. Inventory Problem
C. Transportation Problem
D. PERT

(vi) If there are m sources and n destination in a transportation matrix, the total number of basic variables in a basic feasible

A. m + n
B. m +n+1
C. m + n -1
D. m

(vii) The method used for solving an assignment problem is called

A. Simplex Method
B. Least Cost Method
C. Hungarian Method
D. Stepping Stone Method

(viii) Zero sum game has to be a _____

A. Single Player
B. Two Player
C. Multi Player
D. Three Player

(ix) In PERT chart, the activity time distribution is

A. Normal
B. Binomial
C. Poisson
D. Beta

(x) **Critical Path method is good for**

A. Small Project only
B. Large Project only
C. Both small and large projects equally
D. Neither small or large projects

Que 2 Short Answer (Any Five) – 5x4=20

a) Define OR and discuss the scope of OR.
b) Discuss the importance of OR in decision making.
c) Explain with example on linear programming problem which has no feasible solution. Use graphical method to explain.
d) Distinguish between Transportation Model and Assignment Model.
e) What are the assumptions of Sequencing? Discuss in short with suitable examples.
f) What is Game Theory? Discuss its importance to business decisions.
g) Explain the Decision Making Process.
h) What is the difference between PERT and CPM?

Que 3 Long Answer (Any Five) – 8x5=40

a) Explain How and Why OR methods have been valuable in aiding executive decisions.

b) Solve graphically

Max. $Z = 45 x_1 + 80 x_2$

Subject to $5 x_1 + 20 x_2 \leq 400$

$10 x_1 + 15 x_2 \leq 450$

and $x_1 \geq 0, x_2 \geq 0$

c) What do you understand by balanced and unbalanced transportation problem? How an unbalanced transportation problem is tackled?

d) Give a mathematical model of transportation problem and discuss in brief-
   a) North –West Corner Rule
   b) Least Cost Method
   c) Vogel's Approximation Method

e) Obtain the initial basic feasible solution to the Vogel's Approximation Method.

Distribution Centre (Destinations)

Plants (origins)	D1	D2	D3
	2	7	4
	3	3	1
	5	4	7
	1	6	2

f) Explain the following –
   a) Two-Person Zero Sum Game
   b) Principle of Dominance
   c) Strategy of Game

g) What is Critical Path? Why is the critical path of such importance in large project scheduling and control?

h) Solve the following Game

Player A	Player B: I	Player B: II
I	6	8
II	8	9

i) Define Float. Explain its different type and their importance.

j) Write Short Note on Decision Tree

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