MBA (Sem. - ${ }^{\text {rd }}$ )
APPLIED OPERATIONS RESEARCH SUBJECTCODE : MB - 301 (2K4 Batch)

## Paper ID : [C0111]

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Time : 03 Hours
Maximum Marks : 60

## Instruction to Candidates:

1) Section - A is Compulsory.
2) Attempt any Four questions from Section - B.

## Section-A

Q1)

$$
(10 \times 2=20)
$$

a) Give the advantages of matrix organization.
b) Explain PERT time estimate.
c) . Define saddle point.
d) Explain total float in the project network.
e) List any two project management software packages.
f) Discuss traveling salesman problem.
g) Explain total slack with reference to networking of a project.
h) Enumerate the advantages of matrix organization.
i) . What is resource leveling in relation to PERT/CPM?
j) List two uses of replacement model.

## Section - B

$(4 \times 10=40)$
Q2) Describe the origin and development of operations research.

Q3) Solve the following linear programming problem graphically:
Maximize
$\mathrm{z}=4 \mathrm{x}_{1}+6 \mathrm{x}_{2}$
Subject to the constraint
$\mathrm{x}_{1}+\mathrm{x}_{2}=5$
$\mathrm{x}_{1}>2$
$\mathrm{x}_{2}<4$
$\mathrm{x}_{1}, \mathrm{x}_{2}>0$.

Q4) Discuss the various parameters for a queuing problem.

Q5) Solve the following game:

| 1 | 7 | 2 |
| :--- | :--- | :--- |
| 6 | 2 | 7 |
| 5 | 1 | 6 |

Q6) A project comprising of eight tasks ( A toH) has the following characteristics :

| Tasks | Predecessor | Time duration (weeks) |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  | Optimistic | Most Likely | Pessimistic |
| A | None | 2 | 4 | 12 |
| B | None | 10 | 12 | 26 |
| C | A | 8 | 9 | 10 |
| D | A | 10 | 15 | 20 |
| E | A | 7 | 7.5 | 11 |
| F | B,C | 9 | 9 | 9 |
| G | D | 3 | 3.5 | 7 |
| H | E,F,G | 5 | 5 | 5 |

(a) Calculate the time duration of each activity and the variance.
(b) Draw the network diagram, determine the critical path and mark in the network. What is the total project duration?
(c) What is the probability of achieving the project within the deadline of 30 weeks?

Q7) Find the optimum solution to the following transportation problem:

| To | Sales <br> office <br> From | Sales <br> office <br> B | Sales <br> office <br> C | Total |
| :---: | :---: | :---: | :---: | :---: |
| Factory - A | 1 | 2 | 15 | 100 |
| Factory - B | 3 | 2 | 1 | 130 |
| Factory - C | 12 | 5 | 6 | 75 |
| Factory - D | 3 | 1 | 2 | 95 |
| Total | 120 | 80 | 200 |  |

