FACULTY OF MANAGEMENT

M.B.A. III – Semester (CBCS) Examination, May / June 2018

Subject : Operations Research

Paper – MB-303

Time : 3 hours **Max. Marks : 80**

PART – A (5 x 4 = 20 Marks)
(Short Answer Type)

1 Dynamic programming
2 Simplex method
3 Hungarian method
4 Critical path method
5 Queuing theory

PART – B (5 x12 = 60 Marks)
(Essay Answer Type)

6 a) Define Operation Research. Explain managerial applications and limitation of OR.

OR

b) Define linear programming. Explain its applications.

7 a) What is degeneracy in LPP and how it is resolved.

OR

b) Solve the following LP problem by simplex method.

Maximize $Z = 10x_1 + 15x_2 + 20x_3$
Subject to $2x_1 + 4x_2 + 6x_3 \leq 24$
$3x_1 + 9x_2 + 6x_3 \leq 30$
x_1, x_2 and $x_3 \geq 0$

8 a) Explain various method for solving the Transportation problem.

OR

b) Solve the following assignment problem using Hungarian method :

Job→ / Person↓	I	II	III	IV	V
1	11	17	8	16	20
2	9	7	12	6	15
3	13	16	15	12	16
4	21	24	17	28	26
5	14	10	12	11	15

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9 a) What are the basic steps in PERT/CPM techniques? Explain the applications of PERT/CPM techniques.

OR

b) The time cost estimates for the various activities of a project are given below :

Activity	Preceding activity	Time (in weeks)		Cost (in rupees)	
		Normal	Crash	Normal	Crash
A	---	8	6	8000	10000
B	---	7	5	6000	8400
C	A	5	4	7000	8500
D	B	4	3	3000	3800
E	A	3	2	2000	2600
F	D, E	5	3	5000	6600
G	C	4	3	6000	7000

Find the optimum duration and minimum cost of the project.

10 a) Explain the process of simulation. What are its advantages and limitations?

OR

b) A super market has two girls ringing up sales at the counters. If the service time for each customer is exponential with mean 4 minutes, and if people arrive in a poison fashion at the rate of 10 an hour. Then calculate

i) Probability of having to wait for service

ii) Expected percentage of idle time for each girl

iii) If a customer has to wait, what is the expected length of his waiting time.

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