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B – 1706

Reg. No. :

Name :

**Fifth Semester B.B.A. Degree Examination, November 2016
(Career Related First Degree Programme Under CBCSS)
Group 2(b)
Core Course
BM 1541 – QUANTITATIVE TECHNIQUE FOR MANAGEMENT
(2014 Admn.)**

Time : 3 Hours

Max. Marks : 80

SECTION – A

- I. Answer **all** the questions in **one** or **two** sentences. **Each** question carries 1 mark. **(10×1=10 Marks)**
- 1) Define linear programming.
 - 2) Basic feasible solution.
 - 3) Surplus variable.
 - 4) Give two situations where represent is carried out.
 - 5) Dummy job.
 - 6) Unbalanced assignment problem.
 - 7) Total Float.
 - 8) Event.
 - 9) Latest start time and earliest completion time.
 - 10) Critical path.

SECTION – B

- II. Answer **any 8** questions. **Each** question carries 2 marks. **(8×2=16 Marks)**
- 11) Define operations research. Give any two characteristics.
 - 12) What is modelling in operations research ?
 - 13) Distinguish assignment and transportation problem.

P.T.O.



- 14) What do you mean by group replacement policy ? When is it suitable ?
- 15) What do you understand by infeasible optimal solution ?
- 16) Give any four advantages of PERT.
- 17) What are the steps in critical path method ?
- 18) What are the steps in the operation research process ?
- 19) What are the advantages of linear programming ?
- 20) When does multiple optimal solution arise in L.P.P. ?
- 21) State complete enumeration method of assignment problem.
- 22) What is maximisation transportation problem ?

SECTION – C

III. Answer **any 6** questions. **Each** question carries **4** marks.

(6×4=24 Marks)

- 23) What are the assumptions of L.P.P. ?
- 24) Mention a few applications of assignment method.
- 25) What are the steps in the graphical method of Linear programming problem ?
- 26) What are the applications of operations research in financial management ?
- 27) Compare PERT and CPM.
- 28) A firm produces three products. These products are processed on three different machines. The time required to manufacture one unit of each of the three products and the daily capacity of the three machines are given in the table below :

Machine	Time per unit (minutes)			Machine capacity (minutes/day)
	Product 1	Product 2	Product 3	
M1	2	3	2	440
M2	4	–	3	470
M3	2	5	–	430

It is required to determine the daily number of units to be manufactured for each product. The profit per unit for product 1, 2 and 3 are Rs. 4, Rs. 3 and Rs. 6 respectively. It is assumed that the amounts produced are consumed in the market. Formulate the mathematical model for the problem.

- 29) The maintenance cost and resale value per year of a machine whose purchase price is Rs. 7,000 are given below :

Year	1	2	3	4	5	6	7	8
Maintenance cost in Rs.	900	1200	1600	2100	2800	3700	4700	5900
Resale value in Rs.	4000	2000	1200	600	500	400	400	400

When should the machine be replaced ?

- 30) From the following draw network diagram, find critical path and the project time duration.

Activity	Time
1 - 2	2
1 - 4	2
1 - 7	1
2 - 3	4
3 - 5	1
4 - 6	5
4 - 8	8
5 - 6	4
6 - 9	9
7 - 8	3
8 - 9	5

- 31) What are the requirements for employing linear programming techniques ?



SECTION - D

IV. Answer any two questions. Each question carries 15 marks. (2x15=30 Marks)

32) Solve the following by simplex method.

$$\text{Max } z = 800x_1 + 600x_2 + 300x_3$$

$$\text{s.t. } 10x_1 + 4x_2 + 5x_3 \leq 2000$$

$$2x_1 + 5x_2 + 4x_3 \leq 1009$$

$$x_1 \geq 0, x_2 \geq 0, x_3 \geq 0.$$

33) Solve the following transportation problem.

		I	II	III	
	1	2	7	4	5
Demand	2	3	3	1	8
	3	5	4	7	7
	4	1	6	2	14
		7	9	18	
					Supply

34) The following details are given for a project A.

Activity :	1 - 2	1 - 3	1 - 4	2 - 5	4 - 6	3 - 7	5 - 7	6 - 7	5 - 8	6 - 9
Duration	10	8	9	8	7	16	7	7	6	5

Activity :	7 - 10	8 - 10	9 - 10
Duration	12	13	15

You are required to construct network diagram, determine T_E and T_L values, EST, LST, EFT and LET values of all activities. Also identify critical path.

35) A company has 4 machines, on which to do 3 jobs. Each job can be assigned to one and only one machine. The cost of each job on such machine is given in the following table :

		Machines			
		W	X	Y	Z
Jobs	A	18	24	28	32
	B	8	13	17	19
	C	10	15	19	22

Determine the allocation that minimises the cost.