1ST Semester BACK Examination – 2016-17
QUANTITATIVE TECHNIQUE
BRANCH: MBA
Time: 3 Hours
Max Marks: 70
Q.CODE:Y1179

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1   Answer the following questions: (2 x 10)
   a) What is a linear programming problem?
   b) Explain the role of LPP in solving management problems.
   c) What is an unbalanced assignment problem?
   d) What is degeneracy in transportation problem?
   e) Explain saddle point?
   f) What do you mean by sequencing problem?
   g) What is game theory?
   h) Can there be multiple optimal solutions to an assignment problem?
   i) When we use decision tree?
   j) Briefly mention the areas of application of network techniques.

Q2   A company manufactures 3 types of parts which use precious metals platinum   (10)
        and gold. Due to shortage of these precious metals, the government regulates
        the amount that may be used per day. The relevant data with respect to
        supply,requirements,and profits are summarized in the table as follows:

product	Platinum required/unit (gms)	Gold required/unit (gms)	Profit/unit(Rs)
A	2	3	500
B	4	2	600
C	6	4	1200

Daily allotment of platinum and gold are 160gm and 120gm respectively. How
should the company divide the supply of scarce precious metals?
Formulate it as a linear programming problem.

Q3   Solve the following linear programming problem: (10)
      Maximize $Z= 3x_1+2x_2 +3x_3$

      subject to constraints $2x_1+x_2 +x_3 \leq 2$
                                 $3x_1+4x_2 +2x_3 \geq 8$
                                 $x_1,x_2,x_3 \geq 0$

      is there any alternate optimal solution to this problem?

Q4   Explain the various methods of finding initial feasible solution of a transportation   (10)
      problem and state the advantages and disadvantages, and two areas of
      application for them?

Q5   What is an unbalanced assignment problem? How is the Hungarian Assignment   (10)
      Method applied in respect of such a problem?

Q6   What kinds of decision-making situations may be analysed using PERT and CPM   (10)
      techniques? State the major similarities between PERT and CPM.

Q7   The research department of Hindustan Lever has recommended the marketing   (10)
      department to launch a shampoo of three different types. The marketing manager
      has to decide on of the types of shampoo to be launched under the following
      estimated pay-offs(in millions of Rs)for various levels of sales:

Type of Shampoo	Estimated level of sale(units)		
	15000	10000	5000
Egg shampoo	30	10	10
Clinic shampoo	40	15	5
Deluxe shampoo	55	20	3

      Take optimal decision under each of the following decision rules:

      (a) Maximax (b)Maximin(c)Laplace

Q8   Given the following pay-off matrix of a zero-sum game, determine the optimal   (10)
      strategies for the players and the value of the game:

A's strategy	B's strategy			
	b_1	b_2	b_3	b_4
a_1	5	-4	5	8
a_2	6	2	0	-5
a_3	7	12	8	7
a_4	2	8	-6	5