Q.12. Write short notes on any three:

a) Linear programming

b) Unbalanced Assignment problem

c) PERT

d) Decision tree

e) Laplace criterion for decision making

Q.13. A firm is contemplating the introduction of a new product with new packaging to replace the existing product at much higher price (S_1) or moderate change in the existing product with a new packaging at a small increase in price (S_2) or a small change in the existing product with a negligible change in price (S_3). The three possible states of nature are

P_1: increase in sales; P_2: no change in sales and P_3: decrease in sales.

The following table represents the payoffs (yearly net profit) for each of the three strategies for these events (states of nature)

Strategies	States of nature (pay-off in Rs. '000)		
	P_1	P_2	P_3
S_1	700	300	150
S_2	500	450	100
S_3	300	300	300

Which strategy should be chosen on the basis of:

i) Maximax criterion

ii) maximin criterion

iii) Savage criterion

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Total No. of Questions : 13 Total No. of Printed Pages : 4

BM-2

MBA II Semester (F/T) Examination 2016

MANAGEMENT SCIENCE

Paper - CP-202

Time Allowed : Three Hours

***Maximum Marks :* 80**

Note : There are two sections in this paper. Attempt any four questions from Section A and any three questions from Section B.

Section - 'A'

Short Answer Type Questions

4×8=32

Q.1. Explain degeneracy in transportation problem. How do you resolve degeneracy?

Q.2. Define decision theory and describe decision models based on the criterion of degree of certainty.

Q.3. Define duality in linear programming problem and formulate the dual of following LPP

Maximize $Z = 2x_1 + 3x_2$

Subject to $x_1 + 2x_2 \leq 5$

$2x_1 + x_2 \leq 4$

$x_1 + x_2 \geq 1$

$x_1 \geq 0, x_2 \geq 0$

Q.4. Lake city corporation has four plants each of which can produce any one of the four products. Product cost differs from one plant to another as follows:

		Product			
		1	2	3	4
Plant	A	33	40	43	32
	B	45	28	31	23
	C	42	29	36	29
	D	27	42	44	38

You are required to obtain which product should be produced by which plant to minimize the total cost. No plant can produce more than one product but each must produce one product.

Q.5. Solve the following linear programming problem by graphical method

Minimize $(Z) = 10x_1 + 12.5x_2$

Subject to constraints

$$2x_1 + 4x_2 \geq 40$$
$$4x_1 + 3x_2 \geq 60$$
$$x_1 \geq 0,\ x_2 \geq 0$$

Q.6. What is an operations research model? Write the characteristics of a good operations research model.

Q.7. What do you mean by 'Two person zero sum' game? Solve the following game whose pay off matrix is

		Player B		
		I	II	III
Player A	I	–3	15	–2
	II	–5	–6	–4
	III	–5	20	–8

Q.8. Discuss the limitations of management science (O.R.).

Section - 'B'
Long Answer Type Questions

3×16=48

Q.9. Explain the methodology of operations research.

Q.10. The details for the activities concerning a project are given in the following table:

Activity	Immediate predecessors	Duration (in days)
A	-	3
B	A	5
C	A	5
D	A	4
E	C, D	2
F	B, E	3

Draw the network diagram for the above project. Find the critical activities, critical path and total project completion time.

Q.11. There are five jobs, each of which is to be processed through two machines A and B in the order AB processing times in hours are given in the following table:

Jobs	Processing Times	
	A	B
1	3	4
2	8	5
3	7	1
4	5	2
5	4	3

Obtain the optimum sequence for the five jobs to minimize the total processing time. Find the minimum elapsed time and idle time for each machine.