

MBA – II Semester Supplementary Examinations, March/April 2012
OPERATIONS RESEARCH
(For students admitted in 2009 and 2010 only)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Discuss the significance and scope of OR in modern management.
(b) What is operations research? Describe briefly its applications.
- 2 A company produces four products A, B, C and D. Raw material requirements, storage space needed, production rate and profits are given in the table below. The total amount of raw material available per day for all the four products is 180 kg. Total space available for storage is 230 square metre and 7 hours/day is used for production.

	A	B	C	D
Raw material (kg/piece)	2	2	1.5	4
Space (m ² /piece)	2	2.5	2	1.5
Production rate (piece/hr)	15	30	10	15
Profit (Rs/piece)	5	6.5	5	5.5

Formulate the problem as an LPP to maximize total profit.

- 3 Find the optimal solution to the following transportation problem.

	Centres				
Factories	P	Q	R	S	Availability
A	10	8	7	12	500
B	12	13	6	10	500
C	8	10	12	14	900
Demand	700	550	450	300	

- 4 (a) Write short note on the assignment problem and its applications.
(b) A company has four machines to do three jobs. Each job can be assigned to one and only one machine. The cost of each job on each machine is given in the following table.

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

What are the job assignments which will minimize the cost?

- 5 (a) For what type of business problems might game theory be helpful?
(b) Solve the game by algebraic method for which the pay off matrix is given below

	B		
	1	2	3
A	1	-2	-4
	2	-1	3
	3	1	2

- 6 There are seven jobs, each of which has to go through the machines A and B in the order AB. Processing times in hours are given as

Job	1	2	3	4	5	6	7
Machine A	3	12	15	6	10	11	9
Machine B	8	10	10	6	12	1	3

Determine a sequence of these jobs that will minimize the total elapsed time T. Also find T and idle time for machines A and B.

- 7 (a) Give some applications of queueing theory.
(b) A hospital is studying the proposal to recognize its emergency service facility. The present arrival rate is one call every 15 minutes and the service rate in one call every 10 minutes. Current cost of service is Rs. 100/hr. Each delay in service costs Rs. 125. If the proposal is accepted, the service rate will become one call every six minutes. Can the reorganization be justified on a strictly cost basis only if the proposal increases the cost of service by 50%?
- 8 (a) How will you find the probability of completing a PERT project by a particular due date?
(b) Explain crashing of project networks.
