Code: 9F00205

MCA - II Semester Regular & Supplementary Examinations, August/September 2012
OPERATIONS RESEARCH
(For students admitted in 2009, 2010 & 2011 only)

Time: 3 hours   Max Marks: 60

Answer any FIVE questions
All questions carry equal marks
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1   Explain the objectives of operations research. What is degeneracy? How is it taken care off?

2   Consider the following linear programming problem and solve it using its dual solution.   Maximize $z = 40x_1 + 30x_2 + 25x_3$
   Subject to $4x_1 + 2x_2 + 5x_3 \geq 30$
   $3x_1 + 6x_2 + x_3 \geq 20$
   $x_1 + 3x_2 + 6x_3 \geq 36$
   $x_1, x_2 \text{ and } x_3 \geq 0$

3   The matrix shows the processing times in hours. Solve this assignment problem using Hungarian method.

		Operator				
		1	2	3	4	5
Job	1	20	22	35	22	18
	2	4	26	24	24	7
	3	23	14	17	19	19
	4	17	15	16	18	15
	5	16	19	21	19	25

4   Six jobs are to be processed at three machines A, B and C in the ABC. The time taken by each job on each machine is indicated below. Each machine can process only one job at a time. Determine the sequence for the jobs so as to minimize the processing time.

	Jobs					
Machines	J1	J2	J3	J4	J5	J6
A	12	8	7	11	10	5
B	7	10	9	6	10	4
C	3	4	2	5	15	4

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5   What is dynamic programming? Explain how it can be applied to reliability problems.

6   With an example of your own, explain the procedure used for group replacement policy.

7   The pay off matrix with respect to player B is given below. Solve it optimally.

$$
\begin{array}{c c}
 & \text{A} \\
 & \begin{array}{c c} 1 & 2 \end{array} \\
\text{B} \begin{array}{c} 1 \\ 2 \end{array} & \begin{array}{|c|c|} \hline 6 & 9 \\ \hline 8 & 4 \\ \hline \end{array}
\end{array}
$$

8   For a product to be manufactured within the company, the details are as follows: $r = 36,000$ units/year, $k = 72,000$ units/year, $c_0 = 250$ per set-up; $c_c = Rs\ 25$/unit/year. Find the EOQ and cycle time.

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