Code No: RR311304

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III B.Tech I Semester(RR) Supplementary Examinations, May 2011
OPERATIONS RESEARCH
(Electronics & Control Engineering)

Time: 3 hours   **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks
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1. A factory is engaged in manufacturing three products A,B and C which involve lathe work, grinding and assembly . The cutting, grinding and assembly times required for one unit of A are 2, 1 and 1 hours respectively. Similarly they are 3, 1 and 3 hours for one unit of B and 1,3 and 1 hours for one unit of C. The profits on A,B and C are Rs.2, Rs.2 and Rs. 4 per unit respectively 300 hours of lathe time, 300 hours of grinding time and 240 hours of assembly time are available. How many units of each product should be produced to maximize profit. [16]

2. Solve the following transportation problem [16]

	X	Y	Z	Availability
A	8	7	3	60
B	3	8	9	70
C	11	3	5	80
Demand	50	80	80	

3. Find the minimum cost solution for the 5 x 5 assignment problem whose cost coefficients are as given below. [16]

-2	-4	-8	-6	-1
0	-9	-5	-5	-4
-3	-8	0	-2	-6
-4	-3	-1	0	-3
-9	-5	-9	-9	-5

4. A large computer has 2000 components of identical in nature which are subjected to failure as per the probability distribution given below:

Week end	1	2	3	4	5
Porbability of failure	0.10	0.25	0.50	0.80	1.00

If the cost of individual replacement per unit is Rs.3 and for group replacement per unit is Re.1,assess which of the replacement would be economical and when?

[16]

5. Solve the following game by algebraic method [16]

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

6. (a) Gives a brief description of the various types of queues.

   (b) In a color TV manufacturing plant, a loading unit takes exactly 10 minutes to load two TV sets fat a time into a wagon and again comes back to the position to load another set of TVs. If the arrival of TVs is a Poisson stream at an average of 2 TVs every 20 minutes calculate the average waiting time of 2 TV sets in a stationary state. [6+10]

7. (a) What is lead-time? What activities occur during lead-time?

   (b) An item is produced at a rate of 100 units per day. The demand occurs at the rate of 60 units per day. If the set up cost is Rs 100 per set up, holding cost is Re. 0.02 per unit per day. Find the economic batch size per run and total cost per annum. [6+10]

8. Solve the following problem using Dynamic Programming.
   Maximize Z $= y_1^2 + y_2^2 + y_3^2$ subjected to $y_1, y_2, y_3 \leq 4$ where y_1, y_2, y_3 are positive integers. [16]

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