STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 600 086.
(For candidates admitted during the academic year 2004-2005 & thereafter)

M.Com. DEGREE EXAMINATION APRIL 2009
COMMERCE
SECOND SEMESTER

COURSE   :   **MAJOR – CORE**
PAPER   :   **QUANTITATIVE ANALYSIS FOR MANAGEMENT**
TIME   :   **3 HOURS**   **MAX. MARKS : 100**

SECTION – A

ANSWER ANY FIVE QUESTIONS: (5 x 8 = 40)

1. Four operators are available to a manager who has to get four jobs done by assigning one job to each operator. Given the time needed by different operators for different jobs in the matrix below:

Operators	J1	J2	J3	J4
O1	12	10	10	8
O2	14	12	15	11
O3	6	10	16	4
O4	8	10	9	7

    a) How should manager assign the jobs so that total time needed for all four jobs is minimum.
    b) If job J2 is not to be assigned to operator2, what should be the assignment, how much additional total time will be required.

2. Determine the transportation schedule to minimize the transportation cost. Use the Vogel's Approximation Method to ascertain the initial solution.

	W1	W2	W3	W4	Supplies
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	240	

3. A firm manufactures two types of furniture chairs and tables. The contribution for each product as calculated by the accounting department is Rs.20 per chair and Rs.30 per table. Both products are processed on the machines M1, M2 and M3. The time required by each product and total time available per week on each machine are as follows:

Machines	Chair	Table	Available Hrs.
M1	3	3	36
M2	5	2	50
M3	2	6	60

    How should the manufacturer schedule his production in order to maximize contribution.

4.   Draw a network from the following activities and find a critical path and total
      duration of the project:

Activity	Duration	Activity	Duration
1-2	4	2-6	18
1-3	7	3-5	10
1-4	10	3-6	16
2-3	3	4-5	9
2-4	8	5-6	6
2-5	11	5-7	11
		6-7	8

5.   A small project consists of seven activities, the details of which are given below:

Activity	Duration (days)			Immediate
	Most likely	Optimistic	Pessimistic	predecessor
A	3	1	7	-
B	6	2	14	A
C	3	3	3	A
D	10	4	22	B,C
E	7	3	15	B
F	5	2	14	D,E
G	4	4	4	D

Required:
a) Draw the network, find the critical path, the expected project completion time
    and the next most critical path.

6.   You are given below the following information about advertising and sales

	Advertising expenditure (Rs. In Lakhs)	Sales (Rs. In Lakhs)
Mean	10	90
Standard deviation	3	12

a) Find the likely sales when advertising expenditure is Rs.15 Lakhs.
b) What should be the advertisement expenditure if the company wants to attain
    sales targ.

7.   Explain the different types of forecasting in business decisions.

8.   Write short notes on:
      a) Time series forecasting model
      b) Difference between PERT and CPM
      c) Importance of transportation in decision making.

SECTION – B

ANSWER ANY TWO QUESTIONS: (2 x 20 = 40)

9.   A firm produces four products. There are four operators who are capable of
      producing any of the four products. The processing time varies from operator to
      operator. The firm records 8 hours a day and allows 30 minutes for lunch. The
      processing time in minutes and the profit for each of the product are given below:

Operators	Products			
	A	B	C	D
1	15	9	10	6
2	10	6	9	6
3	25	15	15	9
4	15	9	10	10
Profit per unit – Rs.	8	6	5	4

Find the optimal assignment of products to operators.

10. Solve the following transportation problem for minimum cost:

Destination	Origins				Requirements
	A	B	C	D	
1	7	4	3	4	15
2	3	2	7	5	25
3	4	4	3	7	20
4	9	7	5	3	40
Availability	12	8	35	25	

11. Use Simplex Method to solve the following LP Problem:
Minimize $Z = 8x_1 + 4x_2$
Subject to constraints
$$3x_1 + x_2 \geq 27$$
$$x_1 + x_2 = 21$$
$$x_1 + 2x_2 \leq 40$$
$$x_1 + x_2 \geq 0$$

12. The monthly maintenance work in a machine shop consists of 10 steps A to J the inter relationship between them are indentified by event numbers:

Steps	Events numbers	Duration (Days)
A	1-2	3
B	2-3	5
C	2-4	8
D	3-5	4
E	3-6	2
F	4-6	9
G	4-7	3
H	5-8	12
I	6-8	10
J	7-8	6

a) Draw a Net work
b) Identify the critical path and critical activities
c) Compute early and late start and finish time for each activity.

13. The activities involved in a PERT project are detailed below:

Job	Optimistic	Most likely	Pessimistic
		(duration in weeks)	
1-2	3	6	15
2-3	6	12	30
3-5	5	11	17

7-8	4	19	28
5-8	1	4	7
6-7	3	9	27
4-5	3	6	15
1-6	2	5	14
2-4	2	5	8

a) Draw a net work diagram
b) Find the critical path after estimating the earliest and latest times for all nodes
c) Find the probability of completing the project before 31 weeks.

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