

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

SUBJECT CODE : CM/PC/QA24

M.Com. DEGREE EXAMINATION APRIL 2007
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. Solve the following Assignment problem. The data given in the table refer to production in certain units:

Operators	Machine A	Machine B	Machine C	Machine D
1	10	5	7	8
2	11	4	9	10
3	8	4	9	7
4	7	5	6	4
5	8	9	7	5

2. Find the initial feasible solution by Vogel's Approximation Method:

	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	210	

3. An advertising agency wishes to reach two types of audience customers with annual income of more than Rs.15,000 (target audience A) and customers with annual income of less than Rs.15,000 (target audience B). The total advertising budget is Rs.2,00,000. One programme of TV advertising costs Rs.50,000 and one program of radio advertising costs Rs.20,000. For contract reasons, at least 3 programs have to be on TV and the number of radio programs must be limited to 5. Surveys indicate that a single TV program reaches 4,50,000 customers in target audience A and 50,000 in the target audience B. One program reaches 20,000 in target audience A and 80,000 in the target audience B. Determine the media mix to maximize the total reach.
4. Draw a network from the following activities and find a critical path and total project duration:

Activity	Duration (days)
1-2	10
1-3	4
1-4	6

2-3	5
2-5	12
2-6	9
3-7	12
4-5	15
5-6	6
6-7	5
6-8	4
7-8	7

5. You are given below the following information about advertising and sales
- | | Advertising Expenditure
(Rs.Lacs) (X) | Sales
(Rs.Lacs) (Y) |
|--------------------|--|------------------------|
| Mean | 10 | 90 |
| Standard deviation | 3 | 12 |
- a) Find the likely sales when advertising expenditure is Rs.20 lakhs
b) What should be the advertisement expenditure if the company wants to attain sales target of Rs.115 lakhs.
6. Explain the importance of PERT and CPM in network analysis and differentiate between the two techniques.
7. What is linear programming? Enumerate the steps involved in the formulation of a linear programming problem.
8. Explain the importance of forecasting in management and explain the different types of forecasting methods.

SECTION - B

ANSWER ANY THREE QUESTIONS:

(3 x 20 = 60)

9. The production data of steel in a factory in the past 10 years are given below:
- | Year: | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|------------|------|------|------|------|------|------|------|------|------|------|
| Production | 75 | 86 | 98 | 90 | 96 | 108 | 124 | 140 | 150 | 165 |
- Fit a straight line trend and tabulate the trend values. What is the expected production in 1987 on the basis of the trend?
10. Use Simplex Method to solve the following LP Problem:
Max.Z = $6x_1 + 8x_2$
Subject to constraints:
 $2x_1 + 3x_2 \leq 16$
 $4x_1 + 2x_2 \leq 16$
11. A project has the following characteristics:
- | Activity | Most optimistic time | Most Pessimistic time | Most likely time |
|----------|----------------------|-----------------------|------------------|
| 1-2 | 1 | 5 | 1.5 |
| 2-3 | 1 | 3 | 2 |
| 2-4 | 1 | 5 | 3 |

3-5	3	5	4
4-5	2	4	3
4-6	3	7	5
5-7	4	6	5
6-7	6	8	7
7-8	2	6	4
7-9	5	8	6
8-10	1	3	2
9-10	3	7	5

Construct a PERT net work. Find critical path and variance for each event. Find the project duration at 95% probability.

12. Solve the following transportation problem for minimum cost:

Destinations	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	

13. Write short notes on:

- Dummy destinations
- Time series method of forecasting
- Objective of assignment
- PERT.



