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**D.K.M.COLLEGE FOR WOMEN
(AUTONOMOUS), VELLORE-1
SEMESTER EXAMINATIONS**

APRIL - 2016

15CPCO2D

**QUANTITATIVE TECHNIQUES FOR BUSINESS
DECISIONS**

Time : 3 Hrs

Max.Marks : 75

SECTION-A (5x 6 =30)

Answer ALL the questions.

1. (a) What kinds of decision making situations may be analysed using PERT and CPM Techniques?

(Or)

- (b) Briefly explain the assumptions underlying Linear Programming.
2. (a) Using the following data, obtain the EOQ and the total variable cost associated with the policy of ordering quantities of that size.

Annual Demand	= Rs.20,000
Ordering Cost	= Rs.150 per order.
Inventory carrying cost	= 24 % of average

Inventory value.

(Or)

- (b) A wholesaler supplies 30 stuffed dolls each day to various shops. Dolls are purchased

from the manufacturer in lots of 120 each at Rs.1200 per lot. Every order incurs a handling charge of Rs.60 plus a freight charge of Rs.250 per lot. Multiple and fractional lots can also be ordered and all orders are met the next day. The Incremental cost is Rs.0.60 per year to store a doll in inventory. The wholesaler finances inventory investments by paying its holding company 2% monthly for borrowed funds.

How many dolls should be ordered at a time in order to minimise the total annual inventory cost? Assume that there are 250 week days in a year. How frequently should he order?

3. (a) Find initial basic feasible solution to the following transportation problem using North – West Corner rule.

	D ₁	D ₂	D ₃	
O ₁	5	7	8	70
O ₂	4	4	6	30
O ₃	6	7	7	50
	65	42	43	

(Or)

- (b) Define the following terms:

- (i) Feasible solution.

- (ii) Degenerate solution.
- (iii) Optimal solution.

4. (a) Solve the following minimal assignment problem by Hungarian method.

		Machines			
		1	2	3	4
Jobs	A	9	26	17	11
	B	13	28	4	26
	C	38	19	18	15
	D	19	26	24	10

(Or)

(b) Solve the following minimal assignment problem.

		Workers			
		A	B	C	D
Jobs	1	41	72	39	52
	2	22	29	49	65
	3	27	39	60	51
	4	45	50	48	52

5. (a) On an average, 5 customers reach a barber's shop every hour. Determine the probability that exactly 2 customers will reach in 30 minute period, assuming that the arrivals follow Poisson Distribution (Probabilistic Queuing Model).

(Or)

- (b) The manager of a bank observes that, on the average, 18 customers are served by a cashier in an hour. Assuming that the service time has an exponential distribution, what is the probability that
- (i) A customer shall be free within 3 minutes.
 - (ii) A customer shall be serviced in more than 12 minutes.

SECTION-B (3x15 =45)

Answer any THREE of the following questions.

6. Solve the following LPP.

$$\begin{aligned} \text{Maximise} \quad & Z = 2x_1 + 4x_2, \\ \text{subject to} \quad & 2x_1 + x_2 \leq 18, \\ & 3x_1 + 2x_2 \geq 30, \\ & x_1 + 2x_2 = 26, \\ & x_1, x_2 \geq 0. \end{aligned}$$

7. A manufacturing company has determined from an analysis of its accounting and production data for a certain part that
- i) its demand is 9,000 units per annum and is uniformly distributed over the year.
 - ii) its cost price is Rs.2 per unit
 - iii) its ordering cost is Rs.40 per order.
 - iv) the inventory carrying charge is 9% of the inventory value.

Further, it is known that the lead time is uniform and equals 8 working days and that the total working days in a year are 300.

Determine

- (a) EOQ.
 - (b) The optimum number of orders per annum.
 - (c) Total variable cost.
 - (d) Total re – order level.
 - (e) The number of days stock at reorder level.
 - (f) The length of the inventory cycle.
8. Find the initial basic feasible solution by the least cost method.

	W_1	W_2	W_3	W_4	Availability
F_1	48	60	56	58	140
F_2	45	55	53	60	260
F_3	50	65	60	62	360
F_4	52	64	55	61	220
Requirements	200	320	250	210	

9. Solve the minimal assignment problem.

	I	II	III	IV
A	30	25	26	28
B	26	32	24	20
C	20	22	18	27
D	23	20	21	19

10. Write short notes on the following.

- i) Queuing Theory.
- ii) Network Analysis.
- iii) ABC Analysis.

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