

Overtime hours= 40 employees x (60 days/quarter) x (4 hr/day)=9600 hr/day

Standard labor hr/unit= 15hrs

Labor: Regular time cost = Rs. 10/ hr

Overtime cost = Rs. 15/hr

Material and Overhead (Regular time) = Rs.100/unit

Material and overhead (Over time) = Rs. 60/ unit

Cost of unutilized capacity during regular time = Rs. 60/unit

Back order cost: apportioned at Rs. 5/unit/period.

Inventory carrying cost = Rs. 10/unit/period.

Formulate this problem as a transportation problem and Solve.

12a)

The total cost of a product is related to the number of units produced. The data for the past twelve months is as follows:

Month	1	2	3	4	5	6	7	8	9	10	11	12
Production cost(in 1000s)	30	51	46	22	37	69	21	45	65	55	75	80
No.of units(in 1000s)	5	10	8	4	6	12	4	7	13	10	16	18

- Using regression analysis, determine the relation between Production cost and units produced.
- If the company is planning to produce 11,000 units for the upcoming month, what will be the production cost?
- Compute the standard error of estimate for the regression line. What is its interpretation with respect to this problem?

(OR)

12b) The following data pertains to the demand of a certain product

Period(T)	1	2	3	4	5	6	7	8	9	10	11	12
Demand(X_T)	90	98	105	115	120	127	135	140	145	158	163	171

Apply Holt's method of forecasting to the above data and determine the forecast for the period T = 13 (assume necessary data). Also compute the forecast error.

13a)

The operations manager of a company has received estimates for demand requirements for the next six months as follows:

Month	1	2	3	4	5	6
Forecast	1000	1200	1400	1800	1800	1600

The following plans are being considered.

Plan 1: Maintain a stable workforce that is capable of producing 1500 units per month and meet the demand by overtime at a premium of Rs.50/- per unit. Idle time costs are equivalent to Rs.60/- per unit.

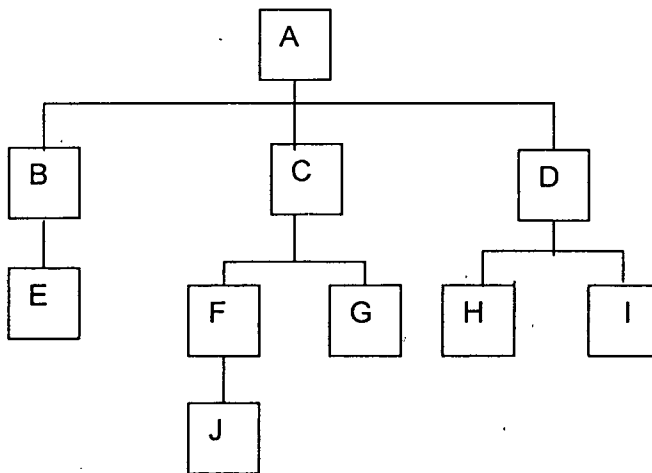
Plan 2: Produce at a steady rate of 1000 units and subcontract additional units at Rs.60/- per unit premium.

Plan 3: Produce at a steady rate of 1300 units per period and accept a limited number of back orders during periods when demand exceeds 1300 units. Stock out costs of lost sales are Rs.100/-. Inventory costs per unit per period are Rs.25/-.

Discuss the merits and disadvantages of these plans. Which plan would you recommend?

(OR)

13b. Given the following product structure, BOM and Inventory status, develop MRP tables for all items. (Consider net requirement as Lot size)



Bill of Materials

Item	No.Reqrd	Initial stock	LT
A	1	0	1
B	1	30	2
C	1	30	1
D	1	50	2
E	1	100	3
F	1	25	1
G	1	50	2
H	1	75	3
I	1	80	2
J	1	25	1

Master Production Schedule

Week	1	2	3	4	5	6	7

Scheduled Quantity	100	100	90	80	150	200	230
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14(a) Briefly discuss the various models used in capacity planning decisions
(OR)

(b) (i)

An automobile-brake supplier operates two shifts of 8 hours each, five days per week, 52 weeks per year. The demand data and time standards for five component are given below :

Component	Time standard		Lot size	Demand (Units)
	Process time (hrs/unit)	Set up time (hrs/lot)		
A	0.05	1.0	60	18,000
B	0.20	4.5	80	13,000
C	0.05	8.2	120	25,000
D	0.25	6.5	140	35,000
E	0.20	8.0	180	40,000

Allow a 25 percent capacity cushion and determine the number of machines required.

b (ii) Briefly explain Rough cut Capacity planning method with an example (10)

15a) Write short notes on the following:

- i. Decision Support System (8)
- ii. Product Design and Development (8)

(OR)

15b) Write short notes on the following:

- i. Capacity Resource Planning (CRP) (8)
- ii. Activities of Production Planning and Control (8)
