

Paper 5 – Cost Management
Answer question No. 1 any four from the rest

Question 1(a):

12 Marks

A Ltd makes and sells a single product. The company's trading results for the year 2007 are:

Particulars	Rs. ' 000	Rs. ' 000
Sales		3,000
Direct Materials	900	
Direct Labour	600	
Overheads	900	(2,400)
Profit		600

For the year 2008, the following are expected:

- (i) Reduction in the Selling Price by 10 %.
- (ii) Increase in the quantity sold by 50 %.
- (iii) Inflation of Direct Material Cost by 8 %.
- (iv) Price inflation in Variable Overhead by 6 %.
- (v) Reduction of Fixed Overhead Expenses by 25 %.

It is also known that –

- (a) In 2006, Overhead expenditure totalled to Rs.8,00,000.
- (b) Total Overhead cost inflation for 2007 has been 5% more than 2006.
- (c) Production and Sales Volumes have been 25% higher in 2007 than in 2006.

The high low method is being used by the Company to estimate overhead expenditure.

You are required to:

- (i) Prepare a Statement showing the estimated trading results for 2008.
- (ii) Calculate the Break Even Point for 2007 and 2008.
- (iii) Comment on the BEP and Profits of the years 2007 and 2008.

Question 1(b):

9 Marks

The following information is available:

Activity		No. of days	No. of men required per day
A	1-2	4	2
B	1-3	2	3
C	1-4	8	5
D	2-6	6	3
E	3-5	4	2
F	5-6	1	3
G	4-6	1	8

- (i) Draw the network and find the critical path.
- (ii) What is the peak requirement of Manpower ? On which day(s) will this occur?
- (iii) If the maximum labour available on any day is only 10, when can the project be completed?

Question 1(c):

3 Marks

Draw and explain the Angle of Incidence in a break – even chart. What is its significance to the management?

Question 2(b):**6 Marks**

The following data has been extracted from the books of Guru Enterprises which is using standard costing system:

Actual Output	=	9,000 units
Direct Wages paid	=	1,10,000 hours at Rs.22j per hour of which 5,000 hours, being idle time, were not recorded in production
Standard Hours	=	10 hours per unit
Labour Efficiency Variance	=	Rs.3,75,000 (A)
Standard Variable OH	=	Rs.150 per unit
Actual Variable OH	=	Rs.16,00,000

Calculate: (a) Idle Time Variance, (b) Total Variable Overhead Variance, (c) Variable Overhead Expenditure Variance, (d) Variable Overhead Efficiency Variance.

Question 2(c):**7 Marks**

M Ltd manufactures a special product purely carried out by manual labour. It has a capacity of 20,000 units. It estimates the following cost structure:

Direct Material	30 Rs. / unit
Direct Labour (1 hour / unit)	20 Rs. / unit
Variable Overhead	10 Rs. / unit

Fixed Overheads at maximum capacity is Rs.1,50,000.

It is estimated that at the current level of efficiency, each unit requires one hour for the first 5,000 units. Subsequently, it is possible to achieve 80% learning rate. The market can absorb the first 5,000 units at Rs.100 per unit. What would be the minimum selling price acceptable for an order of 15,000 units for a prospective client?

Question 3(a):**14 Marks**

X Ltd., has two divisions, A and B, which manufacture products A and B respectively. A and B are profit centres with the respective Divisional Managers being given full responsibility and credit for their performance.

The following figures are presented:

Particulars	Division A – Rs. per unit	Division B – Rs. per unit
Direct Material Cost	50	24 (other than A)
Material A, if transferred from Division A	--	144
Material A, if purchased from outside	--	160
Direct Labour	25	14
Variable Production Overhead	20	2
Variable Selling Overhead	13	26
Selling Price in outside market	160	300
Selling Price to B	144	--
Selling Price to S Ltd	--	250

Other information:

To make one unit of B, one unit of component A is needed. If transferred from A, B presently takes product A at Rs.144 per unit, with A not incurring Variable Selling Overheads on units transferred to B.

Product A is available in the outside market at Rs.160 per unit from competitors.

B can sell its product B in the external market at Rs.300 per unit, whereas, if it supplied to X Ltd's Subsidiary, S Ltd it supplies at Rs.250 per unit, and need not incur Variable Selling Overhead on units transferred to S Ltd. S Ltd requires 6,000 units and stipulates a condition that either all 6,000 units be taken from B or none at all.

Particulars	A	B
Manufacturing capacity	20,000 units	28,000 units
Demand in external market	18,000 units	26,000 units
S Ltd demand	--	6,000 or zero units

Assume that Division A and B will have to operate during the year.

What is the best strategy for –

(i) Department A? (ii) Department B, given that A will use its best strategy? (iii) For X Ltd as a whole?

Question 3(b):**5 Marks**

What is Pareto Analysis? Name some applications.

Question 4(a):**11 Marks**

Biscuit Ltd manufactures 3 types of biscuits A, B and C, in a fully mechanized factory. The Company has been following conventional method of costing and wishes to shift to Activity Based Costing System and therefore wishes to have the following data presented under both the systems for the month.

Inspection Cost	Rs. p.m.	73,000
Machine – Repairs & Maintenance	Rs. p.m.	1,42,000
Dye Cost	Rs. p.m.	10,250
Selling Overheads	Rs. p.m.	1,62,000

Product	A	B	C
Prime Cost (Rs. per unit)	12	9	8
Selling Price (Rs. per unit)	18	14	12
Gross Production (units/production run)	2,520	2,810	3,010
No. of defective units / production run	20	10	10
Inspection (No. of hours / production run)	3	4	4
Dye cost / production run (Rs.)	200	300	250
No. of machine hours / production run	20	12	30
Sales – No. of units / month	25,000	56,000	27,000

The following additional information is given:

- No accumulation of inventory is considered. All good units produced are sold.
- All Manufacturing and Selling Overheads are conventionally allocated on the basis of units sold.
- Product A needs no advertisement. Due to its nutritive value, it is readily consumed by diabetic patients of a hospital. Advertisement Costs included in the Total Selling Overhead is Rs.83,000.

- (iv) Product B needs to be specially packed before being sold, so that it meets competition. Rs.54,000 was the amount spent for the month in specially packing B, and this has been included in the total selling overhead cost given.

You are required to present product-wise profitability statements under the conventional system and ABC system, and accordingly rank the products.

Question 4(b):

4 Marks

What do you mean by a dummy activity? Why is it used in networking?

Question 4(c):

4 Marks

How would you use the Monte Carlo Simulation method in inventory control?

Question 5(a):

8 Marks

Transport Ltd provides tourist vehicles of 3 types – 20 seater vans, 8 – seater big cars and 5 seater small cars. These seating capacities are excluding the drivers. The Company has 4 vehicles of the 20 seater van type, 10 vehicles of the eight seater big car types and 20 vehicles of the 5 seater small car types. These vehicles have to be used to transport employees of their Client Company from their residences to their offices and back. All the residences are in the same housing colony. The offices are at two different places, one is the Head Office and the other is the Branch. Each vehicle plies only one round trip per day, i.e. residence to office in the morning and office to residence in the evening. Each day, 180 officials need to be transported in Route I (from residence to Head office and back) and 40 officials need to be transported in Route II (from Residence to Branch office and back). The cost per round trip for each type of vehicle along each route is given below.

You are required to formulate the information as a linear programming problem, with the objective of minimizing the total cost of hiring vehicles for the Client Company, subject to the constraints mentioned above. (Only formulation is required. Solution is not needed).

Figs. – Rs. /

round trip

	20 –seater vans	8 - Seater big cars	5 – Seater small cars
Route I – Residence – Head Office and Back	600	400	300
Route II – Residence –Branch Office and Back	500	300	200

Question 5(b):

7 Marks

Explain the concept and aim of Theory of Constraints. What are the key measures of Theory of Constraints?

Question 5(c):

4 Marks

What are the major areas of decision making in which differential costing is used?

Question 6(a):

10 Marks

Goods manufactured at 3 plants, A,B and c are required to be transported to sales outlets X,Y and Z. The unit costs of transporting the goods from the plants to the outlets are given below:

Plants	A	B	C	Total Demand
Sales outlet				
X	3	9	6	20
Y	4	4	6	40
Z	8	3	5	60
Total Supply	40	50	30	120

You are required to:

- Compute the initial allocation by North – West Corner Rule.
- Compute the initial allocation by Vogel's approximation method and check whether it is Optimal.

- (iii) State your analysis on the optimality of allocation under North – West Corner Rule and Vogel's Approximation method.

Question 6(b):

7 Marks

Kangan Resorts operates a lodging house with attached facilities of a Shopping Arcade and Restaurant on a National Highway. The following details are available –

The Lodging House has 40 twin bedded rooms, which are to be rented for Rs.200 per night on double occupancy basis. The occupancy ratio is expected at 85% and always both the beds in the room will be occupied. The lodging facilities are operated, for 200 days in the year during foreign tourists season time only.

As per past record the spending pattern of each tourist staying in the Lodge will be Rs. 50 per day in the Shopping Arcade and Rs.80 per day in the Restaurant.

Ratios of Variable Cost to respective Sales Volume are: Shops – 50% and Restaurant – 60%

For the Lodging House the variable cost on house keeping and electricity will be Rs.30 per day per occupied room.

Annual Fixed Overhead for the entire complex is estimated at Rs.10,00,000.

Required:

- Prepare an Income Statement for the next year.
- The Lodging House Manager suggests a proposal of reducing room rent to Rs.150 per day on double occupancy basis, which will increase occupancy level to 95 %. Should the proposal be accepted or not?

Question 6(c):

2 Marks

What do you mean by a flexible budget? Give an example of an industry where this type of budget is typically needed?

Paper 5: COST MANAGEMENT

Question No.1 is compulsory. Answer any four from the rest.

Working notes should form part of the answer.

Question 1(a):

The following tables gives the activities in a construction project and the time duration of each activity:

(6 Marks)

Activity	Preceding activity	Normal Time (Days)
A	-	16
B	-	20
C	A	8
D	A	10
E	B, C	6
F	D, E	12

Required:

- (i) Draw the activity network of the project.
- (ii) Find critical path.
- (iii) Find the total float and free-float for each activity.

Question 1(b):

(14 Marks)

A manufacturer produces three products whose cost data are as follows:

	X	Y	Z
Direct materials (Rs./Unit)	32.00	76.00	58.50
Direct Labour :			
Dept.	Rate/hour (Rs.)	Hours	Hours
1	2.50	18	10
2	3.00	5	4
3	2.00	10	5
	8	4.50	10.50

Variable overheads (Rs.)

Fixed overheads (Rs.) 4,00,000 per annum.

The budget was prepared at a time, when market was sluggish. The budgeted quantities and selling prices are as under :

Product	Budgeted quantity (Units)	Selling price/unit (Rs.)
X	19,500	135
Y	15,600	140
Z	15,600	200

Later, the market improved and the sales quantities could be increased by 20 per cent for product X and 25 per cent each for products Y and Z. The sales manager confirmed that the increased sales could be achieved at the prices originally budgeted. The production manager stated that the output could not be increased beyond the budgeted level due to the limitation of Direct labour hours in department 2.

Required:

- (i) Prepare a statement of budgeted profitability.
- (ii) Set optimal product mix and calculate the optimal profit.

Question 1(c):**(4 Marks)**

S Limited is engaged in manufacturing activities. It has received a request from one of its important customers to supply a product which will require conversion of material 'M', which is a non-moving item.

The following details are available

Book value of material M	Rs. 60
Realisable value of material M	Rs. 80
Replacement cost of material M	Rs. 100

It is estimated that conversion of one unit of 'M' into one unit of the finished product will require one labour hour. At present, labour is paid at the rate of Rs. 20 per hour. Other costs are as follows:

Out-of-pocket expenses	Rs. 30 per unit
Allocated overheads	Rs. 10 per unit

The labour will be re-deployed from other activities. It is estimated that the temporary redeployment will not result in loss of contribution. The employees to be re-deployed are permanent employees of the company.

Required:

Estimate the minimum price to be charged from the customer so that the company is not worse off by executing the order.

Question 2(a):**(10 Marks)**

A company manufactures a single product, which requires two components. The company purchases one of the components from two suppliers: X Limited and Y Limited. The price quoted by X Limited is Rs. 180 per hundred units of the component and it is found that on an average 3 per cent of the total receipt from this supplier is defective. The corresponding quotation from Y Limited is Rs. 174 per hundred units, but the defective would go up to 5 per cent. If the defectives are not detected, they are utilized in production causing a damage of Rs. 180 per 100 units of the component.

The company intends to introduce a system of inspection for the components on receipt. The inspection cost is estimated at Rs. 24 per 100 units of the component. Such as inspection will be able to detect only 90 per cent of the defective components received. No payment will be made for components found to be defective in inspection.

Required:

- Advise whether inspection at the point of receipt is justified ?
- Which of the two suppliers should be asked to supply ? (Assume total requirement is 10,000 units of the component.)

Question 2(b):**(9 Marks)**

What are the distinctive features of learning curve theory in manufacturing environment? Explain the learning curve ratio.

Question 3:**(19 Marks)**

The working results of a Software Company for two corresponding years are shown below :

	Amount (Rs. In lakhs)	
	Year 2005	Year 2006
Sales (A)	600	770
Cost of Sales:		
Direct materials	300	324
Direct wages and variable overheads	180	206
Fixed overheads	80	150
Total (B)	560	680
Profit (A-B)	40	90

In year 2006, there has been an increase in the selling price by 10 per cent. Following are the details of material consumption and utilization off direct labour hours during the two years:

	Year 2005	Year 2006
Direct material consumption (M. tons)	5,00,000	5,40,000
Direct labour hours	75,00,000	80,00,000

Required:

- Taking year 2005 as base year, analyze the variances of year 2006 and also work out the amount which each variance has contributed to change in profit.
- Find out the breakeven sales for both years.
- Calculate the percentage increase in selling price in the year 2006 that would be needed over the sale value of year 2006 to earn margin of safety of 45 per cent.

Question 4(a):

(11 Marks)

A company has four zones open and four marketing managers available for assignment. The zones are not equal in sales potentials. It is estimated that a typical marketing manager operating in each zone would bring in the following Annual sales:

Zones	Rs.
East	2,40,000
West	1,92,000
North	1,44,000
South	1,20,000

The four marketing managers are also different in ability. It is estimated that working under the same conditions, their yearly sales would be proportionately as under:

Manager M :8
 Manager N : 7
 Manager O : 5
 Manager P : 4

Required:

If the criterion is maximum expected total sales, find the optimum assignment and the Maximum sales.

Question 4(b):

(8 Marks)

“In many organizations, initiatives to introduce balanced score card failed because efforts were made to negotiate targets rather than to build consensus.”

Required :

Elucidate the above statement.

Question 5(a):

(5 Marks)

“Cost can be managed only at the point of commitment and not at the point of incidence. Therefore it is necessary to manage cost drivers to manage cost.” Explain the statement with reference to structural and executional cost drivers.

Question 5(b):

(4 Marks)

Explain the main features on ‘Enterprise Resource Planning’.

Question 5(c):**(10 Marks)**

X Limited having an installed capacity of one lakh units of a product is currently operating at 70 per cent utilization. At current level of input prices, the F.O.B costs per unit, taking credit for applicable export incentive workout as follows:

Capacity Utilization	70%	80%	90%	100%
FOB Cost per unit (Rs.)	97	92	87	82

The company has received three foreign offers as under:

Source A : 5,000 units @ Rs. 55 per unit FOB

Source B : 10,000 units @ Rs. 52 per unit FOB

Source C : 10,000 units @ Rs. 51 per unit FOB

Required :

Advice the company whether it should accept any or all the export orders.

Question 6 (a):**(10 Marks)**

What is the fundamental difference between Activity Based Costing System (ABC) and Traditional Costing System? Why more and more organizations in both the manufacturing and non-manufacturing industries are adopting ABC ?

Question 6(b):**(9 Marks)**

What is Target Costing? It is said that implementation of the target costing technique requires intensive marketing research. Explain why intensive marketing research is required to implement target costing technique.

May 2007 Cost Management Questions

Question 1(a):

14 Marks

A Company produces a product X, using raw materials A and B. The Standard mix of A and B is 1:1 and the standard loss is 10% of input.

You are required to compute the missing information indicated by “?” based on the data given below:

	A	B	Total
Standard price of raw materials (Rs./kg.)	24	30	
Actual input (Kg.)	?	70	
Actual output (Kg.)			?
Actual price Rs./kg.	30	?	
Standard input quantity (Kg.)	?	?	
Yield variance (Sub usage)	?	?	270(A)
Mix variance	?	?	?
Usage variance	?	?	?
Price variance	?	?	?
Cost variance	0	?	1300(A)

Question 1(b):

6 Marks

The initial allocation of a transportation problem, along with the unit cost of transportation from each origin to destination is given below. You are required to arrive at the minimum transportation cost by the Vogel's Approximation method and check for optimality.

(Hint : Candidates may consider $u_1 = 0$ at Row 1 for initial cell evaluation)

11	8	8	6	4	18
2	9	12	9	6	10
9	6	8	7	7	8
7	3	5	2	11	4
9	3	5	6		
Availability	8	8	8	4	40
12					

Question 1(c):

4Marks

How does the JIT Approach help in improving an organisation's profitability?

Question 2(a):

11 Marks

A company has produced 1,500 units against a budgeted quantity of 2,000 units. Actual sales were 1,300 units. The company's policy is to value stocks at standard absorption cost.

Other data are:	
Direct material	Rs.100 per unit
Direct labour	Rs.100 per unit at normal efficiency
Variable OH	Rs.50 per unit
Fixed OH at budgeted capacity	Rs.1,00,000
Variable selling OH	Rs.26,000
Budgeted fixed selling OH	Rs.30,000
Actual fixed selling OH	Rs.25,000

Selling price	Rs.400 per unit.
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There was no opening stock:

1. Present the profitability statement under absorption costing system.
2. Assuming actual labour was 25% below normal efficiency and that 100 units of production had to be scrapped after complete manufacture, compute the actual profit or loss.
3. Reconcile the profits under (i) and (ii) above.

Question 2(b):

4Marks

What is product life cycle costing? What are the costs that you would include in product life cycle cost?

Question 2(c):

4Marks

The following information of a company is available for the year 2006:

	Rs.
Sales	40,000
Raw materials	20,000
Direct wages	6,000
Variable and fixed OH	10,000
Profit	4,000
Units sold	200 Nos.

In the year 2007, wages rate will increase by 50% and fixed cost will decrease by Rs.600. If 300 units are sold in 2007, the total fixed and variable OH will be 11,400. How many units should be sold in 2007, so that the same amount of profit per unit as in year 2006 may be earned?

Question 3(a):

11 Marks

A company had planned its operations as follows:

Activity	1-2	2-4	1-3	3-4	1-4	2-5	4-7	3-6	5-7	6-8	7-8
Duration(Days)	7	8	8	6	6	16	19	24	9	7	8

- Draw the network and find the critical paths.
- After 15 days of working, the following progress is noted
 - Activities 1-2, 1-3 and 1-4 completed as per original schedules.
 - Activity 2-4 is in progress and will be completed in 4 more days.
 - Activity 3-6 is in progress and will need 17 more days to complete.
 - The staff at activity 3-6 are specialised. They are directed to complete 3-6 and undertake an activity 6-7, which will required 7 days. This rearrangement across due to a modification in a specification.
 - Activity 6-8 will be completed in 4 days instead of the originally planned in 7 days.
 - There is no change in the other activities.

Update the network diagram after 15 days of start of work based on the assumption given above. Indicate the revised critical paths alongwith their duration.

Question 3(b):

4 Marks

Explain briefly the major components of a Balanced Score Card.

Question 3(c):

4 Marks

Describe the process of zero-base budgeting.

Question 4(a):

7 Marks

A gear manufacturing company makes two types of gears - A and B. Both gears are processed on 3 machines, Hobbing M/c and Grinding M/c. The time required by each gear and total time available per week on each M/c is as follows:

Machine	Gear(A) Hours	Gear (B) Hours	Available Hours
Hobbing M/c	3	3	36
Shaping M/c	5	2	60
Grinding M/c	2	6	60
Other data:			
Selling price (Rs.)	820	960	
Variable cost (Rs.)	780	900	

Determine the optimum production plan and the maximum contribution for the next week by simplex method. The initial table is given below:

		Qty .	C_j	40	60	0	0	0
C_j	Variable			X_1	X_2	X_3	X_4	X_5
0	X_3	36		3	3	1	0	0
0	X_4	60		5	2	0	1	0
0	X_5	60		2	6	0	0	1

Question 4(b):

6 Marks

What are the essential requirement for successful implementation of TQM ?

Question 4(c):

6Marks

A company makes 1,500 units of a product for which the profitability statement is given below:

			Rs.
Sales			1,20,000
Direct materials	30,000		
Direct labour	36,000		
Variable OH	15,000		
Sub-total variable costs		81,000	
Fixed costs		16,800	
Total cost			97,800
Profit			22,200

After the first 500 units of production, the company has to pay a premium of rs.6 per unit towards overtime labour. The premium so paid has been included in the direct labour cost of rs.36,000 given above.

You are required to compute the Break-even point.

Question 5(a):

10 Marks

A research project, to date, has cost a company Rs.2,50,000 and is under review. It is anticipated that, should the project be allowed to proceed, it will be completed in about one year and can be sold for rs.4,00,000. The following additional information is available:

- Materials have just been received for Rs.60,000. These are extremely toxic, and if not used in the project, have to be disposed of by special means at rs.15,000.
- Labour : Rs.75,000. The men are highly skilled. If they are released from the Research Project, they may be transferred to the Works Department of the company and consequently the sales could increase by Rs.1,50,000. The accountant estimates that the prime cost of those sales would be Rs.1,00,000 and the overhead absorbed (All fixed) would amount to Rs.25,000.
- Research staff: Rs.1,60,000. A decision has already been taken that this will be the last major piece of research undertaken and consequently, when work on the project ceases, the staff involved will be made redundant. Redundancy and severance pay have been estimated at Rs.25,000.
- Share of General Building Expenses : Rs.35,000.
The Managing Director is not sure what is included in this amount, but the accounts staff charge similar amounts each year to each department.

You are required to advise whether the project should be allowed to proceed and explain the reasons for the treatment of each of the amounts above in your analysis.

Question 5 (b):

5 Marks

Discuss with examples, the basis costing methods to assign costs to services.

Question 5 (c):

4 Marks

Discuss the application of the learning curve.

Question 6 (a):

12 Marks

Hardware Ltd. manufactures computer hardware products in different divisions which operate as profit centres. Printer Division makes and sells printers. The Printer Division's budgeted income statement, based on a sales volume of 15,000 units is given below. The Printer Division's Manager believes that sales can be increased by 2,400 units, if the selling price is reduced by Rs.20 per unit from the present price of Rs.400 per unit, and that, for this additional volume, no additional fixed costs will be incurred.

Printer Division presently uses a component purchased from an outside supplier at Rs.70 per unit. A similar component is being produced by the Components Division of Hardware Ltd., and sold outside at a price of Rs.100 per unit. Components Division can make this component for the Printer Division with a small modification in the specification, which would mean a reduction in the Direct Material cost for the Components Division by Rs.1.5 per unit. Further, the Component Division will not incur variable selling cost on units transferred to the Printer Division. The Printer Division's Manager has offered the Component Division's Manager a price of Rs.50 per unit of the component.

Component Division has the capacity to produce 75,000 units, of which only 64,000 can be absorbed by the outside market.

The current budgeted income statement for Components Division is based on a volume of 64,000 units considering all of it as sold outside.

	Printer Division Rs.'000	Component Division Rs.'000
Sales revenue	6,000	6,400
Manufacturing cost:		
Component	1,050	—
Other direct materials, direct labour and variable OH	1,680	1,920
Fixed OH	480	704
Total manufacturing cost	3,210	2,624
Gross margin	2,790	3,776
Variable marketing costs	270	384
Fixed marketing and Admn. OH	855	704
Non-manufacturing cost	1,125	1,088
Operating profit	1,665	2,688

- Should the Printer Division reduce the price by Rs.20 per unit even if it is not able to procure the components from the Component Division at Rs.50 per unit?
- Without prejudice to your answer to part (i) above, assume that Printer Division needs 17,400 units and that, either it takes all its requirements from Component Division or all of it from outside source. Should the Component Division be willing to supply the Printer Division at Rs.50 per unit?
- Without prejudice to your answer to part (i) above, assume that Printer Division needs 17,400 units. Would it be in the best interest of Hardware Ltd., for the Components Division to supply the components to the Printer Division at Rs.50? Support each of your conclusions with appropriate calculations.

Question 6(b):

7 Marks

What are the practical applications of Linear Programming?

PAPER 5: COST MANAGEMENT
NOVEMBER 2006

Question 1 is compulsory.
Answer any four from the rest.
Working notes should form part of your answer.

Question 1

(a) X Ltd., manufactures a semi-conductor for which the cost and price structure is given below:

	Rs. Per Unit
Selling Price	500
Direct Material	150
Direct Labour	100
Variable Overhead	50
Fixed Cost = Rs.2 Lakhs.	

The product is manufactured by a machine, whose spare part costing Rs.2,000 needs replacement after every 100 pieces of output. This is in addition to the above costs. Assume that no defectives are produced and that the spare part is readily in the market at all times at Rs.2,000.

- (i) Prepare profitability statement for production levels of 2,000 units and 3,000 units, when Fixed Cost=Rs.1 Lakh. **(4 Marks)**
- (ii) What is the Break Even Point (BEP) for the above data? **(4 Marks)**
- (iii) Comment on the BEP, if the Fixed Cost can be reduced to Rs.1,80,000 from the existing level of Rs.2 Lakhs. **(6 Marks)**
- (b) Give two examples for each of the following categories in activity based costing: **(4 Marks)**
 - i. Unit level activities
 - ii. Batch level activities
 - iii. Product level activities
 - iv. Facility level activities.
- (c) Outline the features of penetration pricing strategy.

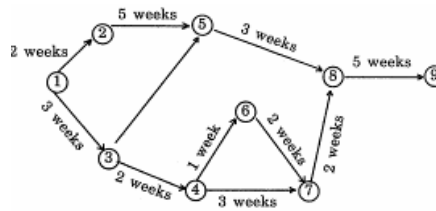
Question 2

(a) A BPO company is taking bids for 4 routes in the city to ply pick up and drop cabs. Four companies have made bids as detailed below: **(6 Marks)**

Bids for Routes(Rs.)				
Company / Routes	R ₁	R ₂	R ₃	R ₄
C ₁	4,000	5,000	--	--
C ₂	--	4,000	--	4,000
C ₃	3,000	--	2,000	--
C ₄	--	--	4,000	5,000

Each bidder can be assigned only one route. Determine the minimum cost that the BPO should incur.

- (b) A network is given below:
 - i. Name the paths and give their total duration.
 - ii. Give three different ways of reducing the project above duration by four days.



- (c) Division Z is a profit centre which produces four products A, B C and D. Each product is sold in the external market also. Date for the period is : (7 Marks)

	A	B	C	D
Market price per unit(Rs.)	150	146	140	130
Variable cost of pdn. per unit (Rs.)	130	100	90	85
Labour hours required per unit	3	4	2	3

Product D can be transferred to division Y, but the maximum quantity that may be required for transfer is 2,500 units of D.

The maximum sales in the external market are:

- A 2,800 units
- B 2,500 units
- C 2,300 units
- D 1,600 units

Division Y can purchase the same product at a price of Rs.125 per unit from outside instead of receiving transfer of product D from Division Z.

What should be the transfer price for each unit for 2,500 units of D, if the total labour hours available in division Z, are 20,000 hrs?

Question 3

- (a) A Multinational company runs a Public Medical Health Centre. For this purpose, it has hired a building at a rent of Rs.10,000 per month with 5% of total taking. Health centre has three types of wards for its patients namely. General ward, cottage ward and Deluxe ward. State the rent to be charged to each bed-day for different type of ward on the basis of the following informations: (12 Marks)

- i. The number of beds of each type are General ward 100, Cottage ward 50, Deluxe ward 30.
- ii. The rent of cottage ward bed is to be fixed at 2.5 times of the General ward bed and that of Deluxe ward bed as twice of the cottage ward bed.
- iii. The occupancy of each type of ward is as follows:
General ward 100%, Cottage ward 80% and Deluxe ward 60%. But, in general ward there were occasions when beds are full, extra beds were hired at a charges of Rs.20 per bed. The total hire charges for the extra beds incurred for the whole year amount to Rs.12,000.
- iv. The Heath Centre engaged a heart specialist from outside and on an average fees paid to him was Rs.15,000 per trip. He makes three trips in the whole year.
- v. The other expenses for the year were as under:

	Rs.
Salary of supervisors, nurses, ward boys	4,25,000
Repairs and maintenance	90,000
Salary of doctors	13,50,000
Food supplied to patients	40,000
Laundry charges for their bed linens	80,500
Medicines supplied	74,000
Cost of oxygen, x-ray, etc other than directly borne for treatment of patients	49,500
General administration charges	63,000

- vi. Provide profit @20% on total taking.
- vii. The Heath Centre imposes 8% service tax on rent received.
- viii. 360 days may be taken in a year.

- (b) (i) What is simulation ? **(1 Mark)**
 (ii) What are the steps in simulation? **(4 Marks)**
- (c) Briefly explain the learning curve ratio. **(2 Marks)**

Question 4

- (a) A company following standard marginal costing system has the following interim trading statement for the quarter ending 30th June, 2005, which reveals a loss of Rs.17,000, detailed below: **(13 Marks)**

	Rs.
Sales	4,99,200
Closing stock (at prime cost)	<u>18,000</u>
	5,17,200
Costs :	
Direct material	1,68,000
Direct labour	1,05,000
Variable overhead	<u>42,000</u>
	3,15,000
Fixed overhead	1,20,000
Fixed Admin. OH	40,000
Variable distribution OH	19,200
Fixed selling OH	<u>40,000</u>
	2,19,200
Total costs	<u>5,34,000</u>
Loss	<u>17,000</u>

Additional information is as follows:

- (i) Sales for the quarter were 1,200 units. Production was 1,400 units, of which 100 units were scrapped after complete manufacture. The factory capacity is estimated at 2,000 units.
- (ii) Because of low production, labour efficiency during the quarter is estimated to be 20% below normal level.

You are required to analyze the above and report to the management giving the reasons for the loss.

- (b) List the steps involved in target costing process with the help of a block diagram. **(6 Marks)**

Question 5

- (a)
- i. What do you mean by ERP? **(2 Marks)**
- ii. Name six benefits of ERP in an enterprise. **(3 Marks)**
- (b) A project consists of seven activities for which relevant data are given below:
- i. Draw the network **(5 Marks)**
- ii. Name and highlight the critical path **(1 Mark)**

Activity	Preceding activity	Activity duration (days)
A	--	4
B	--	7
C	--	6
D	A,B	5
E	A,B	7
F	C,D,E	6
G	C,D,E	5

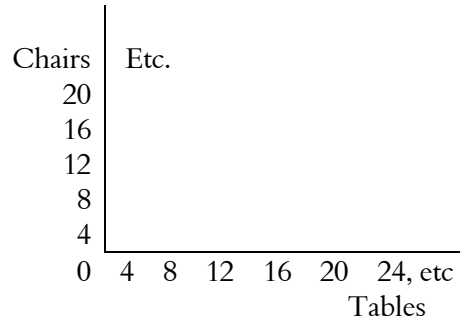
- (c) A Ltd., makes 2 products, Tables (T) and Chairs (C), which must be processed through Assembly (A) and Finishing (F) departments. Assembly has 60 hours available per week; finishing can handle upto 48 hours a week.

Manufacture of one table requires 4 hours of assembly and 2 hours in finishing. Each chairs requires 2 hours in assembly and 4 hours in finishing.

Profit is Rs.80 per table and Rs.60 per chair. Choose the best combination of chairs and tables to be produced to maximize profit.

- Formulate the linear programming model equations.
- Present graphically.
- What is the maximum profit?

Use the graph provided as follows:



Question 6

- (a) The following figures are available. Find out the missing figures, giving appropriate formulae: **(8 Marks)**

			Rs.
	Budgeted profit		15,000
Less :	Adverse variances :		
	Contribution price variance	10,600	
	Direct material variance	1,000	
	Fixed overhead variance	600	(12,200)
			<u>2,800</u>
Add:	Favourable Variances		
	Contribution quantity variance	1,800	
	Direct wages variance	600	
	Variable overhead variance	1,800	4,200
	Actual profit		<u>7,000</u>

There is no inventory

Production units = sales units for both actual and budget.

Other information:

Standard selling price	Rs.18 / unit
Std. variable cost	Rs.15 / unit
Std. contribution	Rs.3 / unit
Actual selling price	Rs.17 / unit
Budgeted sales	10,000 units

Standard material cost p.u. = Re.1 (which is 5 kg. @ Rs.20 paise/kg)

Material usage variance = 400 (Adv.)

Actual labour hours @ actual rate = Rs.63,000

Actual labour hours @ std. rate = Rs.61,950

Variable overhead standard rate = Rs.2

Std. hrs of production = 4 per unit

Variable overhead at std. rate = Rs.84,800

Variable overhead expenditure variance = 400 (A)

Budgeted fixed overhead = Rs.15,000

Find out the following :

- (i) Actual sales units
- (ii) Actual sales rupees
- (iii) Actual quantity of raw materials used
- (iv) Labour efficiency variance
- (v) Actual variable overhead in rupees
- (vi) Variable overhead efficiency variance
- (vii) Actual fixed overheads
- (viii) Operating profit variance.

- (b) Under the single plan, record the journal entries giving appropriate narration, with indication of amounts of debits or credits alongside the entries, for the following transactions using the respective control A/c.

(6 Marks)

- i. Material price variance (on purchase of materials)
- ii. Material usage variance (on computation)
- iii. Labour rate variance.

- (c) Explain with a diagram the value chain activities within the firm with suitable classifications under primary and support activities and also the industry value chain indicating what the end use consumer pays for.

(5 Marks)

PAPER 5 : COST ACCOUNTING & COST SYSTEMS
MAY 2006

Question No.1 is compulsory

Answer any **four** questions from the rest.

Working notes should form part of the answer wherever appropriate, suitable assumptions should be made

Question 1

- (a) What are the elements of a balanced score card? Also explain, how it can be used as a financial planning model. **(4 Marks)**
- (b) What is the concept of "Value-chain" and why is it important for Cost Management? **(4 Marks)**
- (c) Computo Ltd., manufactures two parts "P" and "Q" for Computer Industry. **(16 Marks)**

P: Annual production and sales of 1,00,000 units at a selling price of Rs.100.05 per unit.

Q: Annual production and sales of 50,000 units at a selling price of Rs.150 per unit.

Direct and Indirect costs incurred on these two parts area as follows :

	(Rs. in thousand)		
	P	Q	Total
Direct material cost (variable)	4,200	3,000	7,200
Labour cost (variable)	1,500	1,000	2,500
Direct machining cost (See note)*	700	550	1,250
Indirect costs:			
Machine set up cost			462
Testing cost			2,375
Engineering cost			2,250
			16,037

* Note :Direct machining costs represent the cost of machine capacity dedicated to the production of each product. These costs are fixed and are not expected to vary over the long run horizon.

Additional information is as follows:

	P	Q
Production batch size	1,000 units	500 units
Set up time per batch	30 hours	36 hours
Testing time per unit	5 hours	9 hours
Engineering cost incurred on each product	8.40 lacs	14.10 lacs

A foreign cost incurred on each product very similar to "P". To maintain the company's share and profit. Computo Ltd., has to reduce the price to Rs.86.25. The company calls for a meeting and comes up with a proposal to change design of product "P". The expected effect of new design is as follows:

- Direct material cost is expected to decrease by Rs.5 per unit.
- Labour cost is expected to decrease by Rs.2 per unit.
- Machine time is expected to decrease by 15 minutes, previously it took 3 hours to produce 1 unit of "P". The machine will be dedicated to the production of new design.
- Set up time will be 28 hours for each set up.
- Time required for testing each unit will be reduced by 1 hour.
- Engineering cost and batch size will be unchanged.

Required :

- (a) Company management identifies that cost driver for Machine set-up costs is "set up hours used in batch setting" and for testing costs is "testing time". Engineering costs are assigned to products by special study. Calculate the full cost per unit for "P" and "Q" using Activity based costing.
- (b) What is the mark up on full cost per unit of P?

- (c) What is the Target cost per unit for new design to maintain the same mark up percentage on full cost per unit as it had earlier? Assume cost per unit of cost drives for the new design remains unchanged.
- (d) Will the new design achieve the cost reduction target?
- (e) List four possible management actions that the Computo Ltd., should take regarding new design.

Question 2

- (a) Zilmil Ltd., makes two products “Brightly” and “Lightly”. Both the products use the same labour force, the size of which is restricted to 78,000 hours per month. Brightly needs 2 hours per unit to make whereas lightly needs one hour. The estimated production and sales, manufacturing and selling expenses per month are as follows: **(11 Marks)**

	P		Q	
Production and sales (in Nos.)	12,000	16,000	40,000	48,000
Cost per month (Rs.)	34,00,000	38,00,000	62,00,000	66,80,000

The company is considering pricing option in a highly competitive market. It has estimated sales demand at various selling prices:

Brightly :

Selling price per unit(Rs.)	276	272	268	264	260	254
Sales demand per month	12,000	14,000	16,000	18,000	20,000	22,000

Lightly :

Selling price per unit (Rs.)	163	162	161	160	156	152
Sales demand per month	40,000	42,000	44,000	46,000	48,000	50,000

You are required to compute profit maximizing price and quantity for each product.

- (b) What are some goals of a “transfer – pricing” system in an organization? **(4 Marks)**
- (c) “Overhead variance should be viewed as interdependent rather than independent”. Explain. **(4 Marks)**

Question 3

- (a) Jay Kay Limited is a single product manufacturing company. The following information relates to the months of May and June 2003: **(11 Marks)**

	May (Rs.)	June (Rs.)
(i) Budgeted costs and selling prices:		
Variable manufacturing cost per unit	2.00	2.20
Total fixed manufacturing cost (based on budgeted output of 25,000 units per month)	40,000	44,000
Total fixed marketing cost	14,000	15,400
Selling price per unit	5.00	5.50
(ii) Actual production and sales:	Units	Units
Production	24,000	24,000
Sales	21,000	26,500

(iii) There was no stock of finished goods at the beginning of May 2003. There was no wastage or loss of finished goods during May or June 2003.

(iv) Actual cost incurred corresponded to those budgeted for each month.

You are required to calculate the relative effects on the monthly operating profits of applying: (a) Absorption costing and (b) Marginal Costing.

- (b) What is total – life – cycle costing approach ? Why is it important? **(4 Marks)**
- (c) Why are conventional product costing system more likely to distort product costs in highly automated plants? How do activity based costing system deal with such a situation. ? **(4 Marks)**

Question 4

- (a) An organization manufacture a product, particulars of which are detailed below: **(11 Marks)**

Annual Production (Units)	20,000
Cost per annum (Rs.)	
Material	50,000
Other variable cost	60,000
Fixed costs	40,000
Apportioned Investment (Rs.)	<u>1,50,000</u>

Determine the unit selling price under two strategies mentioned below. Assume that the organization's Tax rate is 40% –

- (a) 20% return on investment.
 (b) 6% profit on list sales, when trade discount is 40%.
 (b) "Sunk Cost is irrelevant in decision – making, but irrelevant costs are not sunk costs". Explain with example. **(4 Marks)**
 (c) How will you apply customer costing in service sector? Explain with the help of a suitable example. **(4Marks)**

Question 5

- (a) A company is engaged in manufacturing two products "X" and "Y". Product X uses one unit of component "P" and two units of component "Q". Product "Y" uses two units of component "P", one unit of component "Q" and two units of component "R". Component "R" which is assembled in the factory uses one unit of component "Q".

Component "P" and "Q" are purchased from the market. The company has prepared the following forecast of sales and inventory for the next year:

	Product "X"	Product "Y"
Sales (in units)	80,000	1,50,000
At the end of the years	10,000	20,000
At the beginning of the year	30,000	50,000

The production of both the products and the assembling of the component "R" will be spread out uniformly throughout the year. The company at present orders its inventory of "P" and "Q" in quantities equivalent to 3 months production. The company has compiled the following data related to two components:

	P	Q
Price per unit (Rs.)	20	8
Order placing cost per order (Rs.)	1,500	1,500
Carrying cost per annum	20%	20%

Required :

- (a) Prepare a Budget of production and requirements of components during next year.
 (b) Suggest the optimal order quantity of components "P" and "Q".
 (b) Differentiate between "Value added" and "Non value added" activities in the context of Activity based costing. **(4 Marks)**
 (c) "The use of Absorption costing method in decision making process leads to anomalies". Discuss. **(4 Marks)**

Question 6

- (a) A company manufactures two products "X" and "Y". Company's fixed cost per annum is Rs.5 lacs. These products are sold for Rs.288 per unit of "X" and Rs.432 per unit of "Y". Standard cost data are:

(11 Marks)

Product "X"	Product "Y"
Rs.	Rs.

Direct Raw material	40	80
Direct wages Rs.8 per hour in Departments:		
1	48	72
2	24	48
3	72	--
4	--	96
Variable overhead	32	28

The company operates 8 hours shift for 300 days in a year. Number of workers engaged by each department is given below:

Department	1	2	3	4
No. of workers	45	24	27	36

Required :

- How many units of each product should be manufactured and what is the resultant maximum profit, if numbers of employees can not be increased or transferred?
 - If only one product is to be manufactured by the Company, which of the products would give the maximum profit and what is the amount of such profit?
- (b) How has the composition of manufacturing costs changed during recent years? How has this change affected the design of cost accounting systems? **(4 Marks)**
- (c) Explain the concept "Learning Curve". How can it be applied for Cost Management? **(4 Marks)**

**PAPER 5: COST MANAGEMENT
NOVEMBER 2005**

Question No.1 is compulsory

Answer any **four** questions from the rest.

Working notes should form part of the answer.

Wherever appropriate, suitable assumptions should be made.

Question 1

- (a) Briefly describe the different methods of Transfer Pricing. **(3 Marks)**
 (b) How Pareto analysis is helpful in pricing of product in the case of firm dealing with multi-products? **(3 Marks)**
 (c) Kitchen King company makes a high-end kitchen range hood "Maharaja". The company presents the data for the year 2003 and 2004 : - **(18 Marks)**

	2003	2004
1. Units of Maharaja produced and sold	40,000	42,000
2. Selling price per unit in Rs.	1,000	1,100
3. Total Direct Material (Square feet)	1,20,000	1,23,000
4. Direct material cost per square feet in Rs.	100	110
5. Manufacturing Capacity (in units)	50,000	50,000
6. Total Conversion cost in Rs.	1,00,00,000	1,10,00,000
7. Conversion cost per unit of capacity (6)/(5)	200	220
8. Selling and Customer service capacity	300customers	290customers
9. Total Selling and Customer service cost in Rs.	72,00,000	72,50,000
10. Cost per customer of selling and customer service Capacity (9) / (8)	24,000	25,000

Kitchen King produces 0 defective units, but it reduces direct material used per unit in 2004. Conversion cost in each year depends on production capacity defined in terms of Maharaja units that can be produced. Selling and Customer service cost depends on the number of customers that the selling and service functions are designed to support. Kitchen King has 230 customers in 2003 and 250 customers in 2004.

You are required

- Describe briefly key elements that would include in Kitchen King's Balance Score Card.
- Calculate the Growth, Price-recovery and productivity component that explain the change in operating income from 2003 to 2004.

Question 2

- (a) Rainbow Ltd., manufactures paint in batches. The company uses standard costing system and the variances are reported weekly. You have taken the account sheet for study for variance analysis discussion. While working coffee was spilled on these sheets and only following could have been retrieved:

(11 Marks)

Dr.	Raw material - 1	Cr.
Beg. Balance	0	18,000
		Closing balance
		6,000
	Raw material - 2	
Beg. Balance	18,000	
		Closing balance
		41,400
	Work - in - progress	
Beg. Balance	0	
Raw material - 2	72,000	Closing balance
	Sundry creditors	0
		1,27,200

Wages outstanding	51,750
Quantity variance - Material -1	
1,200	
Price variance - Material -2	6,600
Efficiency variance - labour	7,200

Other informations are: Standard cost of Material - 2 is Rs.180 per litre and standard quantity is 5 liters. Standard wages rate is Rs.24 per hour and a total 2,300 hours were worked during the week. 1,000 kg of Material -1 and 550 liters of Material - 2 were purchased. Sundry creditors are for material acquisition, and wages outstanding pertain to direct labour.

You are required to compute Material - 1 Rate Variance, Material - 2 Quantity Variance & Labour Spending Variance, Standard hours allowed for production and purchase value of Material -1 for variance analysis discussion.

- (b) Write short note on pricing by service sector. **(4 Marks)**
 (c) Write short note on "Zero Base Budgeting as an approach towards productivity improvement". **(4 Marks)**

Question 3

- (a) X Video Company sells package of blank video tapes to its customer. It purchases video tapes from Y Tape Company @ Rs.140 a packet. Y Tape company pays all freight to X video company. No incoming inspection is necessary because Y tape company has a superb reputation for delivery quality merchandise. Annual demand of X Video Co., is 13,000 packages. X Vide Co. requires 15% annual return on investment. The purchase order lead time is two weeks. The purchase order is passed through Internet and it costs Rs.2 per order. The relevant insurance, material handling etc. Rs.3.10 per package per year. X Vide Co has to decide whether or not to shift JIT purchasing Y tape company agrees to deliver 100 packages of video tapes 130 times per year (5 times every two weeks) instead of existing delivery system 1,000 packages 13 times a year with additional amount of Rs.0.02 per package. X Video Co. incurs no stock out under its current purchasing policy. It is estimated X Video Co. incurs stock out cost on 50 video tape packages under a JIT purchasing policy. In the event of stock out X Video Co., has to rush order tape packages which costs Rs.4 per package. Comment whether X vide company to implement JIT purchasing system.

Z Co. also supply video tapes. It agrees to supply Rs.13.60 per packages under JIT delivery system. If video tape purchased from Z co. relevant carrying cost would be Rs.3 per package against Rs.3.10 in case of purchasing from Y tape co. However Z co. doesn't enjoy so sterling reputation for quality. X vide co. anticipates following negative aspects of purchasing tapes from Z Co.

- to incur additional inspect cost of 5 paisa per packages.
- Average stock out of 360 packages per year would occur, largely resulting from late deliveries. Z co., cannot rush order at short notice. X Video Co. anticipates lost contribution margin per package of Rs.8 from sotckout.
- Customer would likely return 2% of all packages due to poor quality of the tape and to handle this return a additional cost of Rs.25 per package.

Comment wither X Video Co., places order to Z Co.,

- (b) A Pharmaceutical company produces formulations having a shelf life of one year. The company has an opening stock of 30,000 boxes on 1st January, 2005 and expected to produce 1,30,000 boxes as was in the just ended year of 2004. Expected sale would be 1,50,000 boxes. Costing department has worked out escalation in cost by 25% on variable cost and 10% on fixed cost. Fixed cost for the year 2004 is Rs.40 per unit. New price announced for 2005 is Rs.100 per box. Variable cost on opening stock is Rs.40 per box. You are required to compute Breakeven volume for the year 2005. **(7 Marks)**

Question 4

(a) Critically examine "It is prudent to hold large inventories in an inflationary economy". **(4 Marks)**

(b) A businessman employs 20 swing machinists, but he is aware that ten are the better workers than others. He is considering to conduct a training programme for his ten less efficient machinists to increase their efficiency to be equal to that achieved by "better" workers. Relevant data are as follows:

(11 Marks)

- There is one sewing machine for each machinist.
- All the machinists are engaged on similar work and are paid Rs.2.20 each good garment produced on piece work system.
- To rectify each rejected garment costs Rs.4, this work is done by subcontractor.
- Garment machining department operates 2,000 hours a year.
- Average output of per machinist (on the basis of all 20 machinists) is 12 good garments with one rejected per worker per hour. However 10 less efficient machinists average only 10 good garments with 1.5 rejected per worker per hour.
- Depreciation of each sewing machine is Rs.10,000 per year and the variable cost of power, cleaning and preventive maintenance is Rs.5 per hour per machine.
- Fixed production overhead other than depreciation is Rs.20 per machine hour.
- Selling price per garment is Rs.18.
- Direct material cost per garment is Rs.12.
- Training will not reduce productive hours.
- There is no problem in selling increased output.

You are required

- (a) To prepare a statement of comparative costs for the "better" worker and the "less efficient" workers excluding material cost.
- (b) To find out the benefit derived over a one year period, if Rs.1,00,000 is spent on a training course for the "less efficient" workers to match the efficiency with the "better" workers.

(c) Explain the concept of activity based costing. How ABC system support corporate strategy? **(4 Marks)**

Question 5

(a) A Company is organized into two divisions. Division X produces a component, which is used by division Y in making of a final product. The final product is sold for Rs.540 each. Division X has capacity to produce 2,500 units and division Y can purchase the entire production. The variable cost of division X in manufacturing each component is Rs.256.50.

Division X informed that due to installation of new machines, its depreciation cost had gone up and hence wanted to increase the price of component to be supplied to division Y to Rs.297, however division Y can buy the component from outside the market at Rs.270 each. The variable cost of division Y in manufacturing the final product by using the component is Rs.202.50 (excluding component cost).

Present the statement indicating the position of each Division and the company as whole taking each of the following situations separately:

- (i) If there is no alternative use for the production facility of X, will the company, if division Y buys from outside suppliers at Rs.270 per component?
- (ii) If internal facilities of X are not otherwise idle and the alternative use of the facilities will an annual cash saving of Rs.50,625 to division X, should division Y purchase the component from outside suppliers?
- (iii) If there is no alternative use for the production facilities of division X and the selling price for the component in the outside market drops by Rs.20.25, should division Y purchase from outside supplier?

(iv) What transfer price would be fix for the component in each above circumstances?

- (b) A small project is composed of seven activities , whose time estimates are listed below. Activities are identifies by their beginning (i) and ending (j) node numbers. **(7 Marks)**

Activity (i-j)	Estimated durations (in days)		
	Optimistic	Most likely	Pessimistic
1-2	2	2	14
1-3	2	8	14
1-4	4	4	16
2-5	2	2	2
3-5	4	10	28
4-6	4	10	16
5-6	6	12	30

- (a) Draw the project network.
 (b) Find the expected duration and variance for each activity. What is the expected project length?
 (c) What is the probability that project will be completed atleast 8 days earlier than expected?
 (d) If the project due date is 38 days, what is the probability of meeting the due date?

Given :

Z	0.50	0.67	1.00	1.33	2.00
P	0.3085	0.2514	0.1587	0.0918	0.0228

Question 6

- (a) Three grades of coal A, B and C contains phosphorus and ash as impurities. In a particular industrial process, fuel up to 100 ton (maximum) is required which could contain ash not more than 3% and phosphorus not more than .03%. It is desired to maximize the profit while satisfying these conditions. There is an unlimited supply of each grade. The percentage of impurities and the profits of each grades are as follows:

Coal	Phosphorus (%)	Ash(%)	Profit in Rs.(per ton)
A	.02	3.0	12.00
B	.04	2.0	15.00
C	.03	5.0	14.00

You are required to formulate the Liner – programming (LP) model to solve it by using simplex method to determine optimal product mix and profit.

- (b) A Publishing house has bought out a new monthly magazine, which sells at Rs. 37.5 per copy. The cost of producing it is Rs.30 per copy. A News stand estimates the sales pattern of the magazine as follows:

(8 Marks)

Demand	Copies	Probability
0	< 300	0.18
300	< 600	0.32
600	< 900	0.25
900	< 1200	0.15
1200	< 1500	0.06
1500	< 1800	0.04

The news stand has contracted for 750 copies of the magazine per month from the publisher.

The unsold copies are returnable to the publisher who will take them back at cost less Rs.4 per copy for handling charges.

The news stand manager wants to simulate of the demand and profitability. The following random number may be used for simulation:

27,15,56,17,98,71,51,32,62,83,96,69.

You are required to –

- (i) Allocate random numbers to the demand pattern forecast by the newsstand.
- (ii) Simulate twelve months sales and calculate the monthly and annual profit / loss.
- (iii) Calculate the loss on lost sales.

PAPER 5: COST MANAGEMENT
MAY 2005

Question No.1 is compulsory

Answer any four questions from the rest.

Working notes should form part of the answer. Make assumptions wherever necessary.

Question 1

- (a) Define Total Quality Management ? What are the six Cs for successful implementation of TQM? **(4 Marks)**
- (b) What steps are involved in value chain analysis approach for assessing competitive advantages? **(4 Marks)**
- (c) Carlon Ltd., makes and sells a single product, the unit specifications are as follows: **(16 Marks)**

Direct Materials X	: 8 sq. metre at Rs.40 per square metre
Machine Time	: 0.6 Running hours
Machine cost per gross hour	: Rs.400
Selling price	: Rs.1,000

Carlon Ltd., requires to fulfil orders for 5,000 product units per period. There are no stock of product units at the beginning or end of the period under review. The stock level of material X remains unchanged throughout the period.

Carlon Ltd., is planning to implement a Quality Management Programme (QMP). The following additional information regarding costs and revenues are given as of now and after implementation of Quality Management Programme.

Before the implementation of QMP	After the implementation
1. 5% of incoming material from suppliers scrapped due to poor receipt and storage organisation.	1. Reduced to 3%
2. 4% of material X input to the machine process is wasted due to processing problems.	2. Reduced to 2.5%
3. Inspection and storage of Material X costs Re.1 per square metre purchased.	3. No change in the unit rate.
4. Inspection during the production cycle, calibration checks on inspection equipment vendor rating and other checks cost Rs.2,50,000 per period.	4. Reduction of 40% of the existing cost.
5. Production Qty. is increased to allow for the down grading of 12.5% of the production units at the final inspection stage. Down graded units are sold as second at a discount of 30% of the standard selling price.	5. Reduction to 7.5%
6. Production Quantity is increased to allow for return from customers (these are replaced free of charge) due to specification failure and account for 5% of units actually delivered to customer.	6. Reduction to 2.5%
7. Product liability and other claims by customers is estimated at 3% of sales revenue from standard product sale.	7. Reduction to 1%
8. Machine idle time is 20% of Gross machine hrs. used (i.e., running hours = 80% of gross / hrs.)	8. Reduction to 12.5%
9. Sundry costs of Administration, Selling and Distribution total – Rs.6,00,000 per period.	9 Reduction by 10% of the existing.
10.Prevention programme costs Rs.2,00,000	10.Increase to Rs.6,0,000.

The Total Quality Management Programme will have a reduction in Machine Run Time required per product unit to 0.5 hr.

Required:

- (a) Prepare summaries showing the calculation of (i) Total Production units (Pre-inspection), (ii) Purchase of Materials X (square metres), (iii) Gross Machine Hours.
In each case, the figures are required for the situation both before and after the implementation of the Quality Management Programme so that orders for 5,000 product units can be fulfilled.
- (b) Prepare Profit and Loss Account for Carlon Ltd., for the period showing the profit earned both before and after the implementation of the Total Quality Programme.

Question 2

- (a) C Preserves Produces James, Marmalade and Preserves. All the products are produced in a similar fashion; the fruits are cooked at low temperature in a vacuum process and then blended with glucose syrup with added citric acid and pectin to help setting. **(11 Marks)**

Margins are tight and the firm operates, a system of standard costing for each batch of Jam.

The standard cost data for a batch of raspberry jam are:

Fruits extract	400 kgs @ Rs.16 per kg.
Glucose syrup	700 kgs @ Rs.10 per kg.
Pectin	99 kgs @ Rs.33.2 per kg.
Citric acid	1 kg @ Rs.200 per kg.
Labour	18 hours @ Rs.32.50 per hour.

Standard processing loss 3%

The climate conditions proved disastrous for the raspberry corp. As a consequence, normal prices in the trade were Rs.19 per kg for fruits abstract although good buying could achieve some savings. The impact of exchange rates for imported sugar plus the minimum price fixed for sugarcane, caused the price of syrup to increase by 20%. The retail results for the batch were—

Fruits extract	428 kgs @ Rs.18 per kg.
Glucose syrup	742 kgs @ Rs.12 per kg.
Pectin	125 kgs @ Rs.32.8 per kg.
Citric acid	1 kg @ Rs.95per kg.
Labour	20 hours @ Rs.30 per hour.

Actual output was 1,134 kgs of raspberry jam.

You are required to :

- Calculate the ingredients planning variances that are deemed uncontrollable.
 - Calculate the ingredients operating variances that are deemed controllable.
 - Calculate the mixture and yield variances.
 - Calculate the total variances for the batch.
- (b) “Balanced score card and performance measurement system endeavors to create a blend of strategic measures, outcomes and drive measures and internal and external measures”. Discuss the statement and explain the major components of a balanced score card. **(4 Marks)**
- (c) Explain clearly the terms Resources Smoothing and Resource Levelling. **(4 Marks)**

Question 3

- (a) During the Last 20 years, KL Ltd.’s manufacturing operation has become increasingly automated with Computer – controlled robots replacing operators. KL currently manufactures over 100 products of varying levels of design complexity. A single plant rise overhead absorption rate, based on direct labour hours, is used to absorb overhead costs. **(11 Marks)**

In the quarter ended March, KL’s manufacturing overhead costs were:

	(Rs.’000)
Equipment operation expenses	125
Equipment maintenance expense	25
Wages paid to technicians	85

Wages paid to store men	35
Wages paid to despatch staff	40
	<u>310</u>

During the quarter, the company reviewed the Cost Accounting System and concluded that absorbing overhead costs to individual products on a labour hour absorption basis is meaningless. Overhead costs should be attributed to products using an Activity Based Costing (ABC) system and the following was identified as the most significant activities:

- (i) Receiving component consignments from suppliers.
- (ii) Setting up equipment for production runs
- (iii) Quality inspections
- (iv) Despatching goods as per customers orders.

It was further observed that in the short term KL's overheads are 40% fixed and 60% variable. Approximately, half the variable overheads vary in relating to direct labour hours worked and half vary in relation to the number of quality inspections.

Equipment operation and maintenance expense are apportioned as:

- Component stores 15%, manufacturing 70% and goods dispatch 15%

Technician's wages are apportioned as :

- Equipment maintenance 30%; set up equipment for production runs 40% and quality inspections 30%.

During the quarter:

- (i) a total of 2000 direct labour hours were worked (paid at Rs.12 per hr.)
- (ii) 980 components consignments were received from suppliers
- (iii) 1020 production runs were set up
- (iv) 640 quality inspection were carried out
- (v) 420 orders were dispatched to customers.

KL's production during the quarter included components R,S and T. The following information is available :

	Component R	Component S	Component T
Direct labour Hrs. worked	25	480	50
Direct material lists	Rs.1,200	Rs.2,900	Rs.1,800
Component consignments Recd.	42	24	28
Production runs	16	18	12
Quality inspections	10	8	18
Orders (goods) dispatched	22	85	46
Quantity produced	560	12,800	2,400

Required :

- (1) Calculate the unit cost of R, S and T components, using KL's existing cost accounting system.
- (2) Explain how an ABC system would be developed using the information given. Calculate the unit cost of components R,S, and T using ABC system.

- (b) An electronics firm which has developed a new type of fire-alarm system has been asked to quote for a prospective contract. The customer requires separate price quotations for each of the following possible orders:

(8 Marks)

Order	Number of fire –alarm systems
First	100
Second	60
Third	40

The firm estimates the following cost per unit for the first order:

Direct materials Rs.500

Direct labour

Deptt. A (Highly automatic) 20 hours at Rs.10 per hour.

Deptt. B (Skilled labour) 40 hours at Rs.15 per hour.

Variable overheads 20% direct labour

Fixed overheads absorbed :

Deptt.A Rs.8 per hour.

Deptt.B Rs.5 per hour.

Determine a price per unit for each of the three orders, assuming the firm uses a mark up of 25% on total costs and allows for an 80% learning curve.

Extract from 80% Learning curve table:

X	1.0	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
Y (%)	100.0	91.7	89.5	87.6	86.1	84.4	83.0	81.5	80.0

X represents the cumulative total volume produced to date expressed as a multiple of the initial order.

Y is the learning curve factor, for a given X value, expressed as a percentage of the cost of the initial order.

Question 4

- (a) "The diverse use of routinely recorded cost data give rise to a fundamental danger information prepared for one purpose can be grossly misleading in another context" **(4 Marks)**

Discuss to what extent the above statement is valid and explain your conclusion.

- (b) Explain different types of Competitive pricing ? **(4 Marks)**

- (c) R Ltd., has spare capacity in two of its manufacturing departments - Department 4 and Department 5. A five day week of 40 hours is worked, but there is only enough internal work for 3 days per week so that 2 days per week (16 hours) could be available in each department. R Ltd., has sold this time to another manufacturer, but there is some concern about the profitability of this work. **(11 Marks)**

The accountant has prepared a table giving the hourly operating cost in each department. The summarized figures are as follows:

	Department 4	Department 5
	Rs.	Rs.
Power costs	40	60
Labour costs	40	20
Overhead costs	40	40

The labour is paid on a time basis and there is no charge in the weekly wage bill whether or not the plant is working at full capacity. The overhead figures are based on firm's current overhead absorption rates (fixed and variable) when the departments are operating at 90% of full capacity (assume a 50 week year). The budgeted fixed overhead attributed to department 4 is Rs.36,000 p.a. and that for Deptt. 5 Rs.50,400 p.a.

As a short term measure the company has been selling processing time to another manufacturer at Rs.70 per hour in either departments. The customer is willing to continue this arrangement and to purchase any spare time available, but R Ltd., is considering the introduction of a new product on a minor scale to absorb the spare capacity.

Each unit of the new product would require 45 minutes in Deptt. 4 and 20 minutes in Deptt.5. The variable cost of the required input material is Rs.10 per unit. The market study indicated as follows:

- With a selling price of Rs.100, the demand would be 1,500 units p.a.
- With a selling price of Rs.110, the demand would be 1,000 units p.a.
- With a selling price of Rs.120, the demand would be 500 units p.a.

You are required to calculate the best weekly programme for the spare time in the two manufacturing departments, to determine the best price to charge for the new product and to quantify the weekly gain that this programme and price should yield.

Question 5

- (a) "Because a single budget system is normally used to serve several purposes, there is a danger that they may conflict with each other". Do you agree? Discuss. **(4 Marks)**

- (b) AB Cycles Ltd., has 2 divisions, A and B which manufacture bicycle. Division A produces bicycle frame and Division B assembles rest of the bicycle on the frame. There is a market for sub-assembly and the final product. Each division has been treated as a profit centre. The transfer price has been set at the long run average market price. The following data are available to each division: **(9 Marks)**

Estimated selling price of final product	Rs.3,000 p.u.
Long run average market price of sub-assembly	Rs.2,000 p.u.
Incremental cost of completing sub-assembly in division B	Rs.1,500 p.u.
Incremental cost in Division A	Rs.1,200 p.u.

Required:

- (i) If Division A's maximum capacity is 1,000 p.m and sales to the intermediate are now 800 units, should 200 units be transferred to B on long term average price basis.
(ii) What would be the transfer price, if manager of Division B should be kept motivated.
(iii) If outside market increases to 1,000 units, should Division A continue to transfer 200 units to Division B or sell entire production to outside market.
- (c) Determine the selling price per unit to earn a return of 12% net on capital employed (Net of Tax @ 40%) **(6 Marks)**

The cost of production and sales of 80,000 units per annum are:

Material	Rs.4,80,000	Labour	Rs.1,60,000
Variable overhead	Rs.3,20,000	Fixed overhead	Rs.5,00,000

The fixed portion of capital employed is Rs.12 lacs and the varying portion is 50% of sales turnover.

Question 6

- (a) Explain which features of the Service organizations may create problems for the application of activity – based costing. **(4 Marks)**
- (b) A company manufactures two products A and B, involving three departments – Machining, Fabrication and Assembly. The process time, profit / unit and total capacity of each department is given in the following table:

	Machining (hours)	Fabrication (hours)	Assembly (hours)	Profit Rs.
A	1	5	3	80
B	2	4	1	100
Capacity	720	1,800	900	

Set up Linear Programming Problem to maximize profit. What will be the product Mix at Maximum profit level?

- (c) A product comprised of 10 activities whose normal time and cost are given as follows: **(6 Marks)**

Activity	Normal time (days)	Normal cost
1-2	3	50
2-3	3	5
2-4	7	70
2-5	9	120
3-5	5	42

4-5	0	0
5-6	6	54
6-7	4	67
6-8	13	130
7-8	10	166

Indirect cost Rs.9 per day.

- (i) Draw the network and identify the critical path.
- (ii) What are the project duration and associated cost?
- (iii) Find out the total float associated with each activity.

**PAPER 5 : COST MANAGEMENT
NOVEMBER 2004**

Question No.1 is compulsory

Answer any four questions from the rest.

Working notes should form part of the answer.

Wherever appropriate, suitable assumptions should be made.

(Z Table will be provided)

Question 1

- (a) What do you mean by “Back Flushing” in JIT system? Explain briefly the problems with back flushing that must be corrected before it will work properly. **(4 Marks)**
- (b) Explain Skimming pricing strategy. **(4 Marks)**
- (c) Panchwati Cement Ltd., produces “43 grade” cement for which the company has an assured market. The output for 2004 has been budgeted at 1,80,000 units at 90% capacity utilization. The cost sheet based on output (per unit) is as follows: **(16 Marks)**

	Rs.
Selling price	130
Direct material	30
Component “EH”	9.40
Direct wages @ Rs.7 per hour	28
Factory overhead (50% fixed)	24
Selling and distribution overheads (75% variable)	16
Administrative overhead (fixed)	5

The factory overheads are applied on the basis of direct labour hours.

To utilize the idle capacity and to improve the profitability of the company, the following proposals were put up before the Board of Directors for consideration:

- (i) An order has been received from abroad for 500 units of product “53 grade” cement per month at Rs.175 per unit. The cost data are:
Direct material Rs.56 per unit, direct labour 10 hours per unit, selling and distribution overhead applicable to this product order is Rs.14 per unit and variable factory overhead are chargeable on the basis of direct labour hours.
- (ii) The company at present manufacture component “EH” one unit of which is required for each unit of product “43 grade”. The cost details for 15,000 units of component “EH” are as follows:

	Rs.
Direct materials	30,000
Direct labour	52,500
Variable overheads	25,500
Fixed overheads	33,000
Total	1,41,000

- (iii) The component “EH” however is available for purchase at the market at Rs.7.90 per unit. In the event of company deciding to purchase the component “EH” from market, the company has two alternatives for the use of the capacity so released, which are as under:
- a. Rent out the released capacity at Re.1 per hour.

- b. Manufacture component “GYP” which be sold at Rs.8 per unit. The cost data of this component for 15,000 units are:

	Rs.
Direct materials	42,000
Direct labour	31,500
Factory variable overheads	13,500
Other variable overheads	<u>25,500</u>
Total	<u>1,12,500</u>

Required :

- Prepare a statement showing profitability of the company envisaged in the budget.
- Evaluate the export order and state whether it is acceptable or not.
- Make an appraisal of proposal to manufacture component “EH” and state whether the component “EH” should be manufactured in the factory or purchased form the market. Assume that no alternative use of spare capacity is available.
- Evaluate the alternative use of the spare capacity and state whether to manufacture or buy the component “EH” and if your decision is to buy the component “EH”, which of the two alternatives for the use of spare capacity will you prefer?

Question 2

- What are the advantages and limitations of Zero base Budgeting? **(4 Marks)**
- What are the benchmarking code of conduct? **(3 Marks)**
- Explain briefly the main features of ERP. **(4 Marks)**
- A company manufacturers two products A and B by making use of two types of materials viz., X and Y. Product A requires 10 units of X and 3 units of Y. Product B requires 5 units of X and 2 units of Y. The price of X is Rs.2 per unit and that of Y is Rs.3 per unit. Standard hours allowed per product are 4 and 3, respectively. Budgeted wages rate is Rs.8 per hour. Overtime premium is 50% and is payable, if a worker works for more than 40 hours a week. There are 150 workers.
The Sales Manager has estimated the sales of Product A to be 5,000 units and Product B 10,000 units. The target productivity ratio (or efficiency ratio) for the productive hours worked by the direct worker in actually manufacturing the product is 80%, in addition, the non-productive downtime is budgeted at 20% of the productive hours worked. There are twelve 5 days weeks in the budget period and it is anticipated that sales and production will occur evenly throughout the whole period.
It is anticipated that stock at the beginning of the period will be:
Product A 800 units; product B 1,680 units. The targeted closing stock expressed in terms of anticipated activity during the budget period are Product A
12 days sales : Product B 18 days sales. The opening and closing stock of raw material X and Y will be maintained according to requirement of stock position for Product A and B.
You are required to prepare the following for the next period:
 - Material usage and Material purchase budget in terms of quantities and values.
 - Production budget.
 - Wages budget for the direct workers.

Question 3

- XYZ Ltd., manufactures four products, namely A,B,C and D using the same plant and process. The following information relates to a production period: **(11 Marks)**

Product	A	B	C	D
Output in units	720	600	480	504

Cost per unit:	Rs.	Rs.	Rs.	Rs.
Direct material	42	45	40	48
Direct labour	10	9	7	8
Machine hours per unit	4 hr.	3 hr.	2 hr.	1 hr.

During the period the following cost drivers are to be used for the overhead cost :

Cost	Cost driver
Setup cost	No. of production runs
Store receiving	Requisition raised
Inspection	No. of production runs
Material handling and dispatch	Orders executed

It is also determined that:

- Machine operation and maintenance lost should be apportioned between setup cost, store receiving and inspection activity in 4:3:2.
- Number of requisition raised on store is 50 for each product and the no. of order executed is 192, each order being for a batch of 12 of a product.

Required:

- Calculate the total cost of each product, if all overhead costs are absorbed on machine hour rate basis.
 - Calculate the total cost of each product using activity base costing
 - Comment briefly the differences disclosed between overhead traced by present system and those traced by activity base costing.
- (b) A manufacturing company produces two types of product the SUPER and REGULAR. Resource requirements for production are given below in the table. There are 1,600 hours of assembly worker hours available per week. 700 hours of paint time and 300 hours of inspection time. Regular customers bill demand at least 150 units of the REGULAR type and 90 units of the SUPER type. **(8 Marks)**

Type				
Product	Profit / contribution Rs.	Assembly time HRS.	Paint time Hrs.	Inspection time Hrs.
REGULAR	50	1.2	0.8	0.2
SUPER	75	1.6	0.9	0.2

Formulate and solve the given Linear programming problem to determine product mix on a weekly basis.

Question 4

- “Relevant cost analysis help in drawing attention of managers to those elements of costs, which are relevant for the decision “. Comment. **(5 Marks)**
- A company manufactures two products X and Y. Product X requires 8 hours to produce while Y requires 12 hours. In April, 2004, of 22 effective working days of 8 hours a day, 1,200 units of X and 800 units of Y were produced. The company employs 100 workers in production department to produce X and Y. The budgeted hours are 1,86,000 for the year.
Calculate Capacity, Activity and Efficiency ratio and establish their relationship. **(6 Marks)**
- A manufacturing company runs its boiler on furnace oil obtained from X oil company and Y oil company whose depots are situated at a distance of 24 kms and 16 kms from the factory site.
Transportation of furnace oil is made by company's own tank lorries (two) of 8 ton capacity each. Onward trips are made only with full load and the lorries return empty. The filling time take an average of 40 minutes for X oil company and 30 minutes for Y oil company. The empty time in the factory is only 40 minutes for each. The average speed of lorries work out is 24 km per hour. The varying operating charges average 80 paise per km covered and fixed charges gives an incidence of Rs.7.50 per hour of operation.
Calculate the transportation cost per ton-km for each source of furnace oil. **(8 Marks)**

Question 5

- (a) Tycon Ltd., has two manufacturing departments organized into separate profit centres known as Textile unit and Process House. The Textile unit has a production capacity of 5 lacs metres cloth per month, but at present its sales is limited to 50% to outside market and 30% to process house.

The transfer price for the year 2004 was agreed at Rs.6 per metre. This price has been fixed in line with the external wholesale trade price on 1st January, 2004. however, the price of yarn declined, which was the raw material of textile unit, effect that wholesale trade price reduced to Rs.5.60 per metre with effect from 1st June, 2004. This price however not made applicable to the sale made to the processing house of the company. The textile unit turned down the processing house request for revision of price.

The process house refines the cloth and packs the output known as brand Rayon in bundles of 100 metres each. The selling price of the Rayon is Rs.825 per bundle. The process house has a potential of selling a further quantity of 1,000 bundles of Rayon provided the overall prices is reduced to Rs.725 per bundle. In that event it can buy the additional 1,00,000 metres of clot from textile unit, whose capacity can be fully utilized. The outside market has no further scope.

The cost data relevant to the operations are :

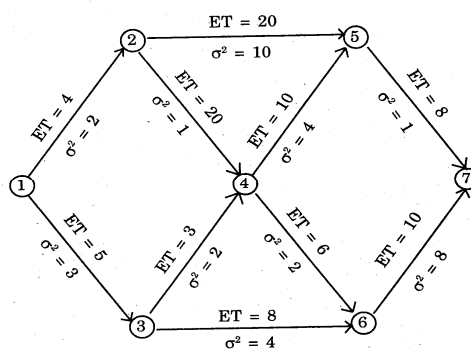
	Textile units Rs.	Process house Rs.
Raw material (per metre) on 1 st June, 2004	3.00	Transfer price
Variable cost	1.20 (per metre)	80 (per bundle)
Fixed cost (per month)	4,12,000	1,00,000

You are required to :

(11 Marks)

- (i) Prepare statement showing the estimated profitability for June, 2004 for Textile unit and Process house and company as a whole on the following basis:
 - a. At 80% and 100% capacity utilization of the Textile unit at the market price and the transfer price to the processing house of Rs.6 per metre.
 - b. At 80% capacity utilization of the Textile unit a the market price of Rs.5.60 per metre and the transfer price to the processing house of Rs.6 per metre.
 - c. At 100% capacity utilization of the Textile unit at the market price of Rs.5.60 per metre and the transfer price to the processing house of Rs.5.60 per metre.
 - (ii) Comment on the effect of the company's transfer pricing policy on the profitability of Processing Scheme.
- (b) Given the following project network, determine:
- i. Earliest expected completion time for each event
 - ii. Latest allowable completion time for each event
 - iii. Slack time for each event
 - iv. The critical path
 - v. The probability that the project will be completed on schedule, if the scheduled completion time is 38.

Project diagram



Question 6

- (a) What is Product life – cycle costing ? describe its characteristics and benefits. **(5 Marks)**
- (b) A Marketing Manager has 5 subordinates and 4 tasks. The subordinates differ in efficiency. The tasks also differ in their intrinsic difficulty. His estimates of the time each subordinate would take to perform each task is given in the matrix below. How should the task be allocated one to one man so that the total man-hours are minimized?

	I	II	III	IV
1	16	52	34	22
2	26	56	8	52
3	76	38	36	30
4	38	52	48	20

- (c) A company trading in motor vehicle spares wishes to determine the level of stock it should carry for the item in its range. Demand is not certain and replenishment of stock takes 3 days. For one item X, the following information is obtained: **(7 Marks)**

Demand (unit per day)	Probability
1	.1
2	.2
3	.3
4	.3
5	.1

Each time an order is placed, the company incurs an ordering cost of Rs.20 per order. The company also incurs carrying cost of Rs.2.50 per unit per day. The inventory carrying cost is calculated on the basis of average stock.

The manager of the company wishes to compare two options for his inventory decision.

- A. Order 12 units when the inventory at the beginning of the day plus order outstanding is less than 12 units.
- B. Order 10 units when the inventory at the beginning of the day plus order outstanding is less than 10 units.

Currently (on first day) the company has a stock of 17 units. The sequence of random number to be used is 08,91,25,18,40,27,85,75,32,52 using first number for day one.

You are required to carry out a simulation run over a period of 10 days, recommend which option the manager should choose.

PAPER 5: COST MANAGEMENT
MAY 2004

Question No.1 is compulsory
Answer any four questions from the rest.
Working notes should form part of the answer.
Makes assumption wherever necessary.
(Graph sheet will be provided on request)

Question 1

- (a) State the need for emergence of activity based costing **(4 Marks)**
(b) Explain the limitation of linear programming **(4 Marks)**
(c) A company manufactures two products. Each product passes through two departments A and B before it becomes a finished product. The data for a year are as under: **(16 Marks)**

Products	Aristocrat	Deluxe
(i) Maximum sales potential in units	7,400	10,000
(ii) Product unit Data:	Rs.90	Rs.80
Selling price per unit		
Machine Hours per unit		
Dept. A Hours	0.50	0.30
Dept.B Hours	0.40	0.45

- (iii) Maximum capacity of Department A is 3,400 hours and Department B is 3,840 hours
(iv) Maximum quantity of direct materials available is 17,000 kg. Each product requires 2 kg of direct materials. The purchase price of the direct materials is Rs.5 per kg.
(v) Variable costs are budgeted at Rs.50 per hour for Department A and Rs.60 per hour for Department B.

In view of the aforesaid production capacity constraints, the company has decided to produce only one of the two products during the year under review.

Required:

- (i) Which of the two products should be produced and sold in the year under review to maximize the profit. Stat the number of units of that product and the resultant contribution.
(ii) The surplus capacity available in Dept. A or Dept. B after manufacture of either Aristocrat or Deluxe is proposed to be hired out to earn a contribution of Rs.40 per hour in the case of Dept.A and Rs.60 per hour in the case of Dept. B. Prepare a statement to show whether Aristocrat or Deluxe should now be produced to maximize the total contribution. Calculate such total contribution.
(iii) The company has been advised to produce 4,250 units of each product and also to hire out the surplus capacity of Dept. A and / or Dept. B. You are required to examine the feasibility of this proposal and to prepare a budge analysis showing the total contribution for the year.

Question 2

- (a) Explain the concept of relevancy of cost in the context of decision making. **(4 Marks)**
(b) State the merits of cost-plus contracts **(3 Marks)**
(c) A single product company operates a system of standard costing. The following data relate to actual output, sales, costs and variances for a month: **(12 Marks)**

Actual output	18,000 units
	Rs.
Actual sales and costs incurred:	
Sales	<u>12,15,000</u>
Direct materials purchased and used 63,000 kg	2,04,750
Direct wages	2,12,040

Variable overheads	2,77,020
Fixed overheads	<u>3,25,000</u>
Total costs	<u>10,18,810</u>
Profit	<u>1,96,190</u>

Standard wage rate is Rs.6 per hour. Budgeted output for the month is 20,000 units. Variances are:

Direct materials	--	Price variance	15,750A
	--	Usage variance	27,000A
Direct labour	--	Rate variance	6,840A
	--	Efficiency variance	10,800 F
Variable overheads	--	Efficiency variance	14,400F
	--	Expense variance	3,420A
Fixed overheads	--	Expense variance	25,000A
	--	Sales price variance	45,000F

Required:

- Present the original budget along with cost sheet showing the standard cost and profit per unit
- Calculate the sale gross margin volume and fixed overheads volume variances
- Prepare an operating statement reconciling the budgeted profit with actual profit.

Question 3

- Trace the stages involved in target costing. **(4 Marks)**
- Explain the concept of learning curve and discuss its relevance to pricing decisions **(4 Marks)**
- A company has a normal manufacturing capacity of 1,50,000 units of a product per annum. The actual costs based on this output achieved during the last year were as under; **(11 Marks)**

	Rs.
Direct materials	36
Direct labour	20
Variable overheads	20
Fixed overheads	20
The budget for the next year envisages the following increases:	
Direct materials	33 1/3%
Direct labour	10%
Variable overheads	5%
Fixed overheads	15%

In view of the substantial increase in material costs, the company explored the possibilities of using a substitute material. The company has been able to identify a cheaper source of direct materials which will cost Rs.40 per unit of output. The tests reveal that the use of cheaper direct material as above will make the following impact on the costs:

- The direct labour cost will increase by Re.1 per unit of output.
- It will lead to 5% rejection in output.
- It will result in final quality testing programme evaluating an additional fixed cost of Rs.4,00,000.

The selling prices are estimated as under for different levels of sales volume for the next year:

Selling price per unit (Rs.):	128	136	144	152	160	168	176
Demand (1,000 units):	190	170	150	140	125	110	95

Required:

- (i) Advise whether the company should use the regular direct materials or cheaper direct materials to maximize its profitability by producing the normal volume of output.
- (ii) Considering the range of selling prices estimated at different volumes of output, determine the selling price which will maximize the profit if; (A) regular direct materials are used and (B) cheaper direct materials are used.
- (iii) Calculate for the price selected by you in (ii) above, the amount of fixed cost at which the company will be indifferent in choice of direct materials.

Question 4

- (a) What are the shortcomings in the use of simulation approach in solving operations research problems? **(3 Marks)**
- (b) State the benefits accruing from Enterprise Resource Planning (ERP) **(4 Marks)**
- (c) A company manufactures three product namely A, B and C. The current pattern of sales of A, B and C is in the ratio of 8:2:1 respectively. The relevant data are as under: **(12 Marks)**

Products	A	B	C
Selling price per units Rs.	130	230	417
Raw materials per unit Kg.	0.50	1.2	2.5
Direct materials per unit Kg.	0.25	--	--
Skilled labour hours/unit Kg.	4	6	8
Semi-skilled labour hours per unit	2	2	3
Variable overheads Rs. Per units	20	40	80

The prices of raw materials and direct materials respectively are Rs.100 and Rs.40 per Kg. The wage rates of skilled and semi-skilled labour respectively are Rs.6 and Rs.5. Each operator works 8 hours a day for 25 days in a month.

The position of inventories are as under:

	Raw materials Kg.	Direct materials Kg.	A units	B units	C units
Opening	600	400	400	100	50
Closing	650	260	200	300	50

The fixed overheads amount to Rs.2,00,000 per month and the company desires a profit of Rs.1,20,000 per month.

You are required to prepare the following for a month:

- (i) Sales budget in quantity and value.
- (ii) Production budget showing the quantity to be manufactured.
- (iii) Purchase budget showing the quantity and value.
- (iv) Direct labour budget showing the number of workers and wages.

Question 5

- (a) Explain the critical success factors for the implementation of a programmed of Total Quality Management (TQM). **(4 Marks)**
- (b) A hotel operated by a company has 180 single rooms and 60 double rooms. The rent of the double rooms is set at 160% of the rent of the single rooms. The operational costs per day per room are estimated as under: **(7 Marks)**

	Single Rooms (Rs.)	Double Rooms(Rs.)
Variable costs	300	500
Fixed costs	500	780

The average occupancy of both the single rooms and double rooms is expected to be 85% throughout a year of 365 days. In fixing the room rent, the company desires to earn a margin of safety of 20%. The hotel has to pay a tax of 20% on its tariff.

Required:

- (i) Calculate the tariff per day per (1) Single room and (2) Double room.
- (ii) The hotel intends to reserve the normal occupancy of 12 single rooms for one of its valued corporate customers at a discount (excluding tax) of 10% of the rent. What increase in the occupancy of the remaining single room days is required to compensate the loss arising from the discount.
- (c) The budgeted data relating to two products manufactured by a company for a month are as under:

(8 Marks)

	Product A	Product B
Selling Price	300	200
Variable manufacturing costs	160	60
Sales commission	60	40

Each unit of product incurs costs in the company's two departments P and Q. The total capacity available for the month under review is budgeted to be 1,400 hours in department P and 2,000 hours in department Q. The capacity costs amount to Rs.14,000 and Rs.20,000 respectively per month for P and Q irrespective of the level of usage made of it. The number of hours required in each of these departments to complete one unit of output is as under :

	A	B
Department P	2	4
Department Q	5	4

The maximum output which the company can sell in the month is restricted to 400 units of either of the products.

You are required to formulate the Linear Programming (LP) model and solve it graphically to determine the optimal product mix and profit.

Question 6

- (a) Outline the objectives of Materials Requirement Planning (MRP) **(4 Marks)**
- (b) A project is composed of seven activities as per details given below: **(8 Marks)**

Activity	Normal time (days)	Crash time (days)	Normal cost Rs.	Crash cost Rs.
1-2	4	3	1,500	2,000
1-3	2	2	1,000	1,000
1-4	5	4	1,875	2,250
2-3	7	5	1,000	1,500
2-5	7	6	2,000	2,500
3-5	2	1	1,250	1,625
4-5	5	4	1,500	2,125

Indirect cost per day of the project is Rs.500

Required :

- (i) Draw the project net work.
- (ii) Determine the critical path and its duration.
- (iii) Find the optimum duration and the resultant cost of the project.
- (c) The company manufactures a component which requires a high degree of precision. Each unit of the component is therefore subjected to a strict quality control test to ascertain whether there is any defect in it. The defects are classified into three categories viz, A,B and C. If defect A occurs in the output, it is scrapped. If defect B or C occurs in the output, it is reworked to rectify the defect. The machine time required to rework defect B component is 30 minutes and that for defect C is 45 minutes. The probabilities are as under:

(7 Marks)

	Defect A	Defect B	Defect C
Defect occurring	0.15	0.20	0.10

Defect not occurring 0.85 0.80 0.90

Using the following random numbers, simulate a study of 10 items of output and determine the number of items with no defects, number of items scrapped due to occurrence of defect A and the total machine time required for rework due to occurrence of defect B or C:

Random number for defect A:	48	55	91	40	93	01	83	63	47	52
Random number for defect B:	47	36	57	04	79	55	10	13	57	09
Random number for defect C:	82	95	18	96	20	84	56	11	52	03

PAPER 5: COST MANAGEMENT
November 2003

Question No.1 is compulsory

Answer any four questions from the rest.

Working notes should form part of the answer. Makes assumption wherever necessary.

Question 1

- (a) What is JIT? Explain, how it eliminate wastages of resources. **(4 Marks)**
 (b) Explain the usefulness of Pareto analysis and its applicability to business situations. **(4 Marks)**
 (c) Jolly Fabrics manufacturers quality napkins at its unit in Tirupur. The unit has a capacity of 60,000 napkins per month.. present monthly production for April is 40,000 napkins. Cost incurred for production are as below: (per unit) **(16 Marks)**

Direct material	Rs.6	No fixed cost
Direct labour	Rs.2	Fixed cost 75%
Manufacturing overhead	<u>Rs.4</u>	Variable 25%
Total	<u>Rs.12</u>	

The marketing costs per unit is Rs.7 (Rs.5 is variable). Marketing costs include distribution costs and customer service costs. Present selling price is Rs.22.50 per unit.

Due to a strike at its existing napkin supplier, a hotel group has offered to buy 10,000 napkins from Jolly Fabrics @ Rs.11 per napkins for the month of June. No further sales to the hotel are anticipated. Fixed manufacturing costs and marketing costs are tied to the 60,000 napkins. The acceptance of the special order is not expected to affect the selling price to regular customers.

No marketing costs involved in special order, prepare:

- (i) Budgeted income statement for June.
- (ii) Actual income statement under absorption costing for April.
- (iii) Should Jolly Fabrics accept the special order from the hotel or not?

Question 2

- (a) Find the optimal solution for the assignment problem with the following cost matrix: **(10 Marks)**

	Marketing Executive	Division			
		N	E	W	S
A		14	20	11	19
B		12	10	15	9
C		16	19	18	15
D		17	13	15	14

- (b) Compare value chain analysis from Traditional Management Accounting. **(4 Marks)**
 (c) What do you mean by Bench Marking? What are perquisites of Bench Marking? **(5 Marks)**

Question 3

- (a) Distinguish Marginal Costing and Absorption Costing **(4 Marks)**
 (b) Explain Pricing by Service Sector **(3 Marks)**
 (c) Department X is a profit centre manufacturing products Vx, Xl, and Xt,. Each of the products can be sold in the outside market to the extent of the following: **(12 Marks)**

Vx	900 units
Xl	300 units
Xt	600 units

Market price per unit is Rs.24, Rs.23 and Rs.20 for Vx, Xl, and Xt,. Respectively. Other details are given below:

Products	Vx,(Rs.)	Xl,(Rs.)	Xt,(Rs.)
Variable cost of production	17	12	14
Labour hours required	3	2	4

Product Vx can be transferred to department y, but the maximum quantity that might be required for transfer is 400 units of Vx. The Manager of department y has power to buy the product Vx from the external market at a much cheaper price of Rs.22.

What should be the transfer price for each unit for 400 units of Vx, if the total labour hours available in Department x is

- (a) 4,800 hours
- (b) 6,200 hours?

Question 4

- (a) A manufacturing company has an installed capacity of 1,50,000 units per annum. Its cost structure is given below: **(12 Marks)**

	(Per unit) Rs.
Variable cost	10
Labour (minimum Rs.1,00,000 per month)	10
Overheads	4
Fixed overheads : Rs.1,92,300 per annum	

Semi-variable overheads Rs.60,000 per annum at 75% capacity, which increases by Rs.4,000 per annum for every 5% increases in capacity utilization for the year as a whole.

The capacity utilization for the next year is estimated at 75% for three months 80% for six months and 90% for the remaining part of the year. If the company is planning to have a profit of 20% on the selling price, calculate the selling price per unit?

- (b) What is Life cycle costing? Explain the stages in product life cycle? **(7 Marks)**

Question 5

- (a) Asha Road Carriers is a transporting company that transports goods from one place to another. It measures quality of service in terms of: **(11 Marks)**

- i. Time required to transport goods.
- ii. On-time delivery
- iii. Number of lost or damaged cartons.

To improve its business prospects and performance the company is seriously considering to install a scheduling and tracking system, which involves an annual outlay of Rs.1,50,000, besides equipments costing Rs.2,00,00 needed for installation of the system. The company proposes to utilize the proceeds of the fixed deposit maturing next month to purchase the equipment. The rate of interest at present on deposit is 10%. The company furnishes the following information about its present and anticipated future performance:

	Current	Expected
On-time delivery	85%	95%
Variable costs per carton lost or damaged	Rs.50	Rs.50
Fixed costs per carton lost	Rs.30	Rs.30
Number of cartons lost or damaged	3,000	1,000

The company expect that each per cent point increase in on-time performance will result in revenue increase of Rs.18,000 per annum. Contribution margin of 45% is required. Should Asha Road Carriers acquire and install the new system?

- (b) A manufacturer produces two products D1 and D2 using two machines R1 and R2. Products D1 requires 2 hours on machine R1 and 6 hours on machine R2. Product D2 utilizes 5 hours of machine R1 only. Total hours available per day on machine R1 is 16 and R2 is 30. Profit margin from D1 and D2 is Rs.2 and Rs.10 per unit respectively. Using simplex method find out the daily production mix to optimize profit. **(8 Marks)**

Question 6

- (a) Explain the theory of Constraints. **(4 Marks)**
- (b) What is Monte Carlo simulation? How it is useful in inventory control? **(4 Marks)**
- (c) Supreme Ltd., which manufactures the component EXCEL, has achieved a turnover of Rs.6,00,000 for the calendar year 2002. The manager of the company has informed that the company has worked at a profit volume ratio of 25% and margin of safety of 20%. But he feels due to sever competition, the selling price is to be reduced to maintain the same volume of sales for the year 2003. He does not expect any change in variable costs. He expects that due to cost reduction programme, the profit volume ratio and margin of safety will be 20% and 30% respectively and considerable saving in Fixed cost for 2003.

(11 Marks)

Even if the company prefers to shut down its operations for 2003, it expects to incur a minimum fixed cost of Rs.60,000. You are expected to:

- (i) Present the comparative statement for the year 2002 and 2003 showing under marginal costing.
- (ii) What will be minimum sales required, if it decides to shut down its unit in 2003?.

PAPER 5 : COST ACCOUNTING & COST SYSTEMS
MAY 2003

Question No.1 is compulsory Answer any four questions from the rest.

Working notes should form part of the answer.

Make assumptions wherever necessary

(Area under standard normal curve table will be provided on request)

Question 1

- (a) Explain the steps involved in target costing approach to pricing (4 Marks)
 (b) Enumerate the industrial applications of linear programming. (4 Marks)
 (c) A company manufactures two products EXE and WYE, which pass through two of its departments exclusively used for them. A market research study conducted by the company reveals that the company can sale either 38,500 units of EXE or 31,500 units of WYE in a years. The manufacturing cost and selling price details are as under: (16 Marks)

	EXE		WYE	
	Rs.		Rs.	
Selling price per unit	375		540	
Costs:				
Department 1:				
Direct Materials	58		100	
Direct Labour	5 hours	50	7.5 hours	75
Department 2:				
Direct materials	21		26	
Direct labour	7.5 hours	90	10 hours	120
Overheads	Dept.1		Dept.2	
Variable overhead rate per direct labour hour	Rs.2.40		Rs.3.60	
Fixed overhead	Rs.5,00,000		Rs.10,00,000	
Budgeted overhead labour hours	1,75,000		2,80,000	

Since the quantity which can be sold exceeded the production capacity, the company has been considering the use of sub-contracting production facilities. Accordingly, when tenders were floated, two contractors responded as under:

Contractor DS offers to produce upto a maximum of 17,500 units of EXE OR 14,000 units of WYE in a year for the type of work done by department 1 of the company. The price charged by DS is Rs.138 per unit of EXE and Rs.212 per unit of WYE. These prices included the cost of direct materials used in department 1 of the company.

Contractor DW can produce upto a maximum of 11,200 units of EXE and 7,000 units of WYE in a year for the type of work done by department 2 of the company. The price charged by DW is Rs.150 per unit of EXE and Rs.192 per unit of WYE. These prices included the cost of direct materials used in department 1 of the company.

Required :

- (i) If the company does not wish to use the sub-contracting facility, which of the two products and in what quantity should be produced and sold by the company by using its own manufacturing capacity to earn maximum profit? Calculate the resultant maximum profit.
 (ii) If the company wishes to produce either 38,500 units of EXE or 31,500 units of WYE by using sub-contracting facility, state which of the two products should be produced to maximize the profits. Calculate the resultant maximum profit.

Question 2

- (a) Outline the key attributes of an operational database. (4 Marks)
 (b) State the major features of Enterprise Resource Planning (ERP). (3 Marks)

- (c) A company, which uses standard marginal costing, furnishes the following details relating to a single product manufactured and sold in a quarter: **(12 Marks)**

	Budget	Actual
Sales units	6,000	6,400
	(Rs.'000)	(Rs.'000)
Sales	1,500	1,696
Direct materials	240	270
Direct labour	360	416
Variable overheads	600	648
Total variable costs	1,200	1,334

The sales budget is based on the expectation of the company's estimate of market share of 12%. The market report reveals that the actual sales of the product in the whole country for the quarter is 60,000 units.

Further data are given as under:

	Standard	Actual
Direct material price per kg.	Rs.8	Rs.7.50
Direct labour rate per hour	Rs.6	Rs.6.40

Required :

i. Compute the following variances for the quarter :

- Gross margin sales
 - Market size variance
 - Market share variance
 - Volume variance.
- Sales price variance
- Direct materials usage and price variances
- Direct labour efficiency and rate variances
- Variable overheads efficiency and expense variances.

ii. Prepare an operating statement reconciling the budgeted contribution with actual contribution.

Question 3

- (a) State the main types of information which will be required by a manager to implement the balanced score card approach to performance measurement. **(4 Marks)**
- (b) Distinguish between a slack variable and an artificial variable in linear programming. **(3 Marks)**
- (c) SV Ltd., manufactures a single product. The selling price of the product is Rs.95 per unit. The following are the results obtained by the company during the last two quarters : **(12 Marks)**

	Quarter 1	Quarter 2
Sales units	5,100	4,800
Production units	5,500	4,500
	Rs.	Rs.
Direct material A	66,000	54,000
B	55,000	45,000
Manufacturing wages	1,56,750	1,38,000
Factory overheads	86,000	83,000
Selling overheads	79,000	73,000

The company estimates its sales for the next quarter to range between 5,500 units and 6,500 units, the most likely volume being 6,000 units. The manufacturing programme will match with the sales quantity such that no increase in inventory of finished goods is contemplated in the next quarter. The following price and cost changes will, however, apply to the next quarter:

- The price of direct material B will increase by 10%. There will be no change in the price of direct material A.

- The wage rates will go up by 8%. If the production volume increases beyond 5,500 units, overtime premium of 50% is payable on the increased volume due to overtime working to be done by the variable labour complement.
- The fixed factory and selling expenses will increase by 20% and 25% respectively.
- A discount in the selling price of 2% is allowed on all sales made at 6,500 units level of output. The selling price, however, will remain unaltered, if the volume of output is below 6,500 units.

While operating at a volume of output of 6,500 units in the next quarter, the company intends to quote for an additional volume of 2,000 units to be supplied to a Government department for its captive consumption. The working capital requirement of this order is estimated at 80% of the sales value of the Government order. The company desires a return of 20% on the capital employed in respect of this order.

Required :

- (i) Prepare a flexible budget for the next quarter at 5,500 , 6,000 and 6,500 units levels and determine the profit at the respective volumes.
- (ii) Calculate the lowest price per unit to be quoted in respect of the Government order for 2,000 units.

Question 4

- (a) State the areas in which the application of learning curve theory can help a manufacturing organization. **(4 Marks)**
- (b) In what circumstances can penetration pricing policy be adopted ? **(3 Marks)**
- (c) A company manufactures several products of varying levels of designs and models. It uses a single overhead recovery rate based on direct labour hours. The overhead incurred by the company in the first half of the year are as under: **(12 Marks)**

	Rs.
Machine operation expenses	10,12,500
Machine maintenance expenses	1,87,500
Salaries of technical staff	6,37,500
Wages and salaries of stores staff	2,62,500

During this period, the company introduced activity based costing system and the following significant activities were identified.

- Receiving materials and components.
- Set up of machines for production runs
- Quality inspection.

It is also determined that:

- The machine operation and machine maintenance expenses should be apportioned between stores and production activity in 20:80 ratio.
- The technical staff salaries should be apportioned between machine maintenance, set up and quality inspection in 30:40:30 ratio.

The consumption of activities during the period under review are as under:

– Direct labour hours worked	40,000
– Direct wages rate Rs.6 per hour	
– Production set-ups	2,040
– Material and component consignments received from suppliers	1,960
– Number of quality inspection carried out	1,280

The data relating to two products manufactured by the company during the period are as under:

	Products	
	P	Q
Direct material costs	Rs.6,000	4,000
Direct labour hours	960	100

Direct material consignments received	48	52
Production runs	36	24
Number of quality inspections done	30	10
Quantity produced (units)	15,000	5,000

A potential customer has approached the company for the supply of 24,000 units of a component K to be delivered in lots of 3,000 units per quarter. The job will involve an initial design cost of Rs.60,000 and the manufacture will involve the following per quarter:

Direct material costs	Rs.12,000
Direct labour hours	300
Production runs	6
Inspection	24
Number of consignments of direct materials to be received	20

The company desires a mark up of 25% on cost.

Required :

- Calculate the cost of products P and Q based on the existing system of single overhead recovery rate.
- Determine the cost of products P and Q using activity based costing system.
- Compute the sales value per quarter of component K using activity based costing system.

Question 5

- State the assumptions of Cost – volume – profit analysis. **(4 Marks)**
- A company using a continuous manufacturing operation achieves an output of 3 kg. per hour. The selling price is Rs.450 per kg. The raw material cost is Rs.125 per kg of output and the direct labour and variable overheads amount to Rs.316 per kg. of output. The company has provided an expenditure of Rs.640 on maintenance and Rs.6,400 on break down repairs per month in its budget. Breakdowns averaging 300 hours per month occur due to mechanical faults. These could be reduced or eliminated, if additional maintenance on the following scale were undertaken: **(7 Marks)**

Break down hours	Maintenance costs (Rs.)	Repair Costs (Rs.)
0	20,480	0
60	10,240	1,920
120	5,120	2,560
180	2,560	3,840
240	1,280	5,120
300	640	6,400

Using the incremental cost and incremental revenue concept, you are required to :

- Determine the optimum level upto which breakdown can be reduced to increase production:
 - Calculate the additional profits obtainable at that level as compared to the present situation.
- A company has three factories and four customers. The company furnishes the following schedule of profit per unit on transportation of its goods to the customers in rupees: **(8 Marks)**

Factory	Customers				Supply
	A	B	C	D	
P	40	25	22	33	100
Q	44	35	30	30	30
R	38	38	28	30	70
Demand	40	20	60	30	

You are required to solve the transportation problem to maximize the profit and determine the resultant optimal profit.

Question 6

- Outline the limitations of negotiated method of transfer pricing. **(4 Marks)**

- (b) With a view to improving the quality of customer services, a Bank is interested in making an assessment of the waiting time of its customers coming to one of its branches located in a residential area. This branch has only one teller's counter. The arrival rate of the customers and the service rate of the teller are given below:

Time between two consecutive arrivals of customers (in minutes)	3	4	5	6	7
Probability	0.17	0.25	0.25	0.20	0.13
Service time by the teller (in minutes)	3	4	5	6	7
Probability	0.10	0.30	0.40	0.15	0.05

You are required to simulate 10 arrivals of customers in the system starting from 11AM and show the waiting time of the customers and idle time of the teller.

Use the following random numbers taking the first two random numbers in two digits each for first trail and so on:

11,56,23,72,94,83,83,02,97,99,83,10,93,34,33,53,49,94,37 and 97

- (c) A project consist of the following activities, whose time estimates are given against each as under: **(8 Marks)**

Activity	Estimated duration (weeks)		
	Optimistic	Most likely	Pessimistic
1-2	3	6	15
1-3	2	5	14
1-4	6	12	30
2-5	2	5	8
2-6	5	11	17
3-6	3	6	15
4-7	3	9	27
5-7	1	4	7
6-7	4	19	28

Required :

- Draw the project net work.
- Find the expected duration and variance of each activity.
- Determine the critical path and the expected project duration.
- What is the probability that the project will be completed in 38 weeks?
- What project duration will have 95% chance of completion. ($Z_{0.95} = 1.65$)

Given :

Z	0.21	0.41	0.82
Ø	0.0832	0.1591	0.2939

PAPER 5: COST MANAGEMENT
NOVEMBER 2002

Question No.1 is compulsory Answer any four questions from the rest.

Working notes should form part of the answer.

Makes assumption wherever necessary.

(Log table, antilog table, graph sheet will be provided on request)

Question 1

- (a) Explain, how does value chain approach help an organization to assess its competitive advantage. **(3 Marks)**
- (b) State the requirements for operation of a Materials Requirement Planning (MRP) system **(5 Marks)**
- (c) A construction company has accepted contract AX and work thereon is about to begin. However, the company has received an offer for another contract BX. The company cannot, due to certain constraints, take up both the contracts simultaneously. In case the company is desirous of taking up contract BX, it can get the first contract AX rescinded upon payment of a penalty of Rs.70,000 **(16 Marks)**

The following are the estimates relating to the two contracts

	Contract AX Rs.	Contract BX Rs
Material X-in stock at original cost	54,000	--
Material Y-in stock at original cost	--	62,000
Material X-firm orders placed at original cost	76,000	--
Material X-not yet ordered (at current cost)	1,50,000	--
Material Z-not yet ordered (at current cost)	--	1,78,000
Labour – to be engaged and paid for	2,15,000	2,75,000
Site management costs	85,000	85,000
Travel and other expenses	17,000	14,000
Depreciation of plant	24,000	32,000
Interest on capital at 12%	12,800	16,000
Head office expenses allocated to contracts	31,690	33,100
Total	6,65,490	6,95,100
Contract price	7,20,000	8,80,000
Estimated profit	54,510	1,84,900

The following additional information is available:

- Material X is not in regular use. It can be used as a substitute for other materials, which are currently quoted at 10% less than the original cost of X.
- Material Y is in regular use and its price has doubled since it was purchased. Its net realizable value if sold will be its new price less 15%. It can, however, be kept in store for use in other contracts to be taken up in the next year.
- If contract AX is undertaken, a part of the plant having spare capacity can be hired out for a rental of Rs.15,000 for the period.
- It is the policy of the company to charge notional interest on the estimated working capital at 12% per annum.
- Either of two contracts can be completed by 31st March, 2003, which is the close of the company's financial year.
- Site management cost is fixed.

Required:

- (i) Using the relevancy of cost concept prepare a comparative statement to show the net benefit resulting from each contract.
- (ii) Advise the management of the company as to which of two contracts should be undertaken.

Question 2

- (a) State the benefits of product life – cycle costing. **(4 Marks)**
- (b) What are the common methods of obtaining initial feasible solution in a transportation problem. **(3 Marks)**
- (c) A single product company has prepared the following cost sheet based on 8,000 units of output per month: **(12 Marks)**

	Rs.
Direct Materials 1.5 kg @ Rs.24 per kg	36.00
Direct Labour 3 hours @ Rs.4 per hour	12.00
Factory overheads	<u>12.00</u>
Total	<u>60.00</u>

The flexible budget for factory overheads is as under:

Output (units)	6,000	7,500	9,000	10,500
Factory Overheads(Rs.)	81,600	92,400	1,03,200	1,14,000

The actual results for the month of October, 2002 are given below:

- Direct Materials purchased and consumed were 11,224 kg at Rs.2,66,570.
- Direct Labour hours worked were 22,400 and Direct Wages paid amounted to Rs.96,320.
- Factory overheads incurred amounted to Rs.96,440 out of which the variable overhead is Rs.2.60 per Direct Labour hour worked.
- Actual output is 7,620 units.
- Work-in-process:
 - Opening WIP: 300 units;
 - Materials 100% complete
 - Labour and Overheads 60% complete
 - Closing WIP : 200 units;
 - Materials 50% complete
 - Labour and Overheads 40% complete

You are required to analyze the variances.

Question 3

- (a) Explain briefly four different categories of activities that drive the expenses at the product level. **(3 Marks)**
- (b) State, how is Zero base Budgeting superior to Traditional Budgeting **(4 Marks)**
- (c) A company has developed a new product. The sales volume of the new product was estimated to be between 15,000 and 20,000 units per month at a price of Rs.20 per unit. Alternatively, if the selling price is reduced to Rs.18 per unit, the sales volume will be between 24,000 and 36,000 units per month. If the production is maintained below 20,000 units per month, the variable manufacturing cost will be Rs.16.50 per unit and the fixed cost Rs.48,500 per month. If the production exceeds 20,00 units per month, the variable manufacturing cost will be reduced to Rs.15.50 per month, but the fixed costs will increase to Rs.64,500 per month. The company paid Rs.40,000 as fee for market survey and in addition incurred a cost of Rs.60,000 in developing the new product. **(12 Marks)**
- In the event of taking up this new line of business, it will be necessary to use the building space, which has been let out for a rental of Rs.5,600 per month.
- You are required to analyze the Potential profitability of the proposal of the company at different levels of output and make suitable recommendations relating to the price and volume of output to be set.

Question 4

- (a) Enumerate the main objectives of transfer pricing **(3 Marks)**
- (b) Explain the terms Resource smoothing and Resource leveling **(4 Marks)**

- (c) A hospital operates a 40 bed capacity special health care department. The said department levies a charge of Rs.425 per bed day from the patient using its services. The data relating to fees collected and costs for the year 2001 are as under: **(12 Marks)**

	Rs.
Fees collected during the year	34,95,625
Variable costs based on patient days	13,57,125
Departmental fixed costs	6,22,500
Apportioned costs of the hospital administration charges	10,00,000

Besides the above, nursing staff were employed as per the following scale at Rs.48,000 per annum per nurse.

Annual patient days	No. of nurses required
Less than 5000	3
5000 – 7000	4
7000 – 90000	6
Above 9000	8

The projections for the year 2002 are as under :

- The costs other than apportioned overheads will go up by 10%
- The apportioned overheads will increase by Rs.2,50,000 per annum
- The salary of the nursing staff will increase to Rs.54,000 per annum per nurse.

The occupancy of the bed capacity is not likely to increase in 2002 and consequently the management is actively considering a proposal to close down the department. In that event, the departmental fixed costs can be avoided.

Required:

- (i) Present statements to show the profitability of the department for the years 2001 and 2002.
- (ii) Calculate the :
 - Break-even bed capacity for the year 2002
 - Increase in fee per bed day required to justify continuance of the department.

Question 5

- (a) Outline the limitations of simulation. **(4 Marks)**
- (b) A company has 10 direct workers, who work for 25 days a month of 8 hours per day. The estimated down time is 25% of the total available time. The company received an order for a new product. The first unit of the new product requires 40 direct labour hours to manufacture the product. The company expects 80% (index is – 0.322) learning curve for this type of work. The company uses standard absorption costing and the cost data are as under: **(8 Marks)**

Direct Materials	Rs.60 per unit
Direct Labour	Rs.6 per direct labour hour
Variable overheads	Re. 1 per direct labour hour
Fixed overheads	Rs.7,500 per month.

Required:

- (i) Calculate the cost per unit of the first order of 30 units
 - (ii) If the company receives a repeat order for 20 units, what price will be quoted to yield a profit of 25% on selling price?
- (c) A project consists of the following activities with the time estimates noted against each: **(7 Marks)**

Activity	Time Estimate (weeks)	Activity	Time Estimate (Weeks)
1-2	2	3-7	5
1-3	2	4-6	3
1-4	1	5-8	1

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

Required :

- (i) Draw a network diagram
- (ii) Determine the critical path and its duration
- (iii) Calculate the total float for each activity.

Question 6

- (a) How does Total Quality Management (TQM) facilitate value addition in an organization? **(4 Marks)**
- (b) A company manufactures three components. These components pass through two of the company's departments P and Q. the machine hour capacity of each department is limited to 6,000 hours in a month. The monthly demand for components and cost data are as under:

Components	A	B	C
Demand (units)	<u>900</u>	<u>900</u>	<u>1350</u>
	Rs.	Rs.	Rs.
Direct Materials / unit	45	56	14
Direct Labour / unit	36	38	24
Variable Overheads / unit	18	20	12
Fixed overheads	P.@ Rs.8 per hour	16	12
	Q @ Rs.10 per hour	<u>30</u>	<u>10</u>
	Total	<u>145</u>	<u>72</u>

Components A and C can be purchased from market at Rs.129 each and Rs.70 each respectively.

You are required to prepare a statement to show which of the components in what quantities should be purchased to minimize the cost.

- (c) A company manufactures two products namely A and B. The contribution per kg of output is Rs.240 and Rs.140 respectively for products A and B. The total fixed costs amount to Rs.1,200 per week. The production of two products is restricted by limited supplies of three items of raw materials namely P, Q, and R. The quantities of P, Q and R which are necessary to produce single units of the products A and B together with the total stock of materials available each week are given below: **(8 Marks)**

	Product A	Product B	Total Quantity available per week (kg)
Raw material P	16	20	160
Q	10	25	150
R	4	0	32

Using the graphical approach of Linear Programming (LP), calculate the maximum Profit per week.

PAPER 5: COST MANAGEMENT
MAY 2002

Question No.1 is compulsory. Answer any four from the rest.

Question 1

- (a) Explain “relevant costs and benefits’ in the context of decision –making, **(4 Marks)**
 (b) Explain the term “life –cycle’ costing. **(4 Marks)**
 (c) XYZ Limited is currently manufacturing 5,000 units of the product “XY 100” annually, making full use of its machine capacity. The selling price and total costs per unit associated with “XY 100” are as follows;

	Rs.	Rs.
Selling price per unit		900
Costs per unit:		
Direct materials	200	
Variable machine operating costs (Rs.100 per machine hour)	150	
Manufacturing overhead costs	180	
Marketing and administrative costs	<u>200</u>	<u>730</u>
Operating income per unit of “XY 100”		<u>170</u>

XYZ Limited can sell additional 3,000 units of “XY 100”, if it can outsource those additional units.

ABC Limited, a supplier of quality products, has agreed to supply upto 6,000 units of “XY 100” per year at a price of Rs.650 per unit delivered at XYZ’ s factory.

XYZ Limited can use its facility to produce an alternative product “XY 200”. It can sell up to 12,000 units of “XY 200” annually. Estimated selling price and total costs per unit to manufacture and sell 12,000 units of “XY 200” are as follows:

	Rs.	Rs.
Selling price per unit		600
Cost per unit:		
Direct materials	200	
Variable machine operating costs (Rs.100 per machine hour)	50	
Manufacturing overheads costs	60	
Marketing and administrative costs	<u>110</u>	<u>420</u>
Operating income per unit of “XY 200”		<u>180</u>

Other information pertaining to the operation of XYZ Limited is as follows:

- (a) XYZ Limited use machine hours as the basis for assigning fixed manufacturing overhead. The fixed manufacturing overhead for the current year is Rs.3,00,000. these costs will not be affected by the product mix decision.
 (b) Variable marketing and administrative costs per unit for various products are as follows:
 Manufactured “XY 100” Rs.80
 Purchased “XY 100” Rs.40
 Manufactured “XY 200” Rs.60
 Fixed marketing administrative costs for the current year is Rs.6,00,000. these costs will not be affected by the product mix decision.
 Required :
 Calculate the quantity of each product that XYZ Limited should manufacture and / or purchase to maximize operating income
 Show your calculation. **(16marks)**

Question 2

- (a) Differentiate between “cost indifference point” and “break-even point” **(4 Marks)**

- (b) A Limited has been offered a contract that, if accepted, would significantly increase next year's activity level. The contract requires the production of 20,000 kgs. Of product X and specifies a contract price of Rs.1,000 per kg. The resources required in the production of each kg. of X include the following;

Resources per kg of X.

Labour :	
Grade 1	2 Hours
Grade 2	6 Hours
Materials :	
A	2 units
B	1 Liter

Grade 1 labour is highly skilled and although currently under utilized in the firm, it is A's policy to continue to pay Grade 1 labour in full. Acceptance of the contract would reduce the idle time of Grade 1 labour. Idle time payments are treated as non-production overheads.

Grade 2 is unskilled with a high turnover, and may be considered a variable cost.

The cost to A for each type of labour are:

Grade 1 Rs.40 per hour; Grade 2 Rs.20 per hour.

The materials required to fulfill the contract would be drawn from the materials already in stock Material A is widely used within the firm and any usage for the contract will necessitate replacement. Material B was purchased to fulfill an expected order that was not received. If material B is not used for the contract, it will be sold.

For accounting purpose FIFO is used. The various values and costs for A and B are as follows:

	A	B
	Per unit (Rs.)	Per unit (Rs.)
Book Value	80	300
Replacement cost	100	320
Net realizable value	90	250

A single recovery rate for the fixed factory overheads is used throughout the firm, even though some of these costs could be attributed to a particular product of department. The overhead is recovered by applying a pre-determined rate per productive labour hour. Initial estimates of next year's activity, which exclude the current contract, show fixed production overhead of Rs.60,00,000 and production labour hours of 3,00,000. acceptance of the contract would increase fixed production overheads by Rs.22,80,000.

Variable production overheads are accurately estimated at Rs.30 per productive labour hour.

Acceptance of the contract would encroach on the resources used to produce and sale another product Y, which is also made by A Limited. It is estimated that the sale of Y would then decrease by 5,000 units in the next year only. However, this reduction in sale of Y would enable attributable fixed factory overhead of Rs.5,80,000 to be avoided. Information on Y is as follows:

	Per unit
Selling	Rs.700
Labour Grade 2	4 hours
Materials relevant variable costs	Rs.120

Required:

Advise A Limited on the desirability of the acceptance of the contract purely on economic considerations. Show your calculations. **(15 Marks)**

Question 3

- (a) Distinguish between "Cost Reduction" and "Cost Management" **(4 Marks)**
 (b) The two manufacturing division of a company is organized on profit centre basis. Division X is the only source of a component required by Division Y for their product "P". Each unit of P requires one unit of

the said component. As the demand of the product is not steady orders for increased quantities can be obtained by manipulating prices. The manager of Division Y has given the following forecast:

Sales per day (Units)	Average price per units of P (Rs.)
5,000	393.75
10,000	298.50
15,000	247.50
20,000	208.50
25,000	180.00
30,000	150.75

The manufacturing cost (excluding the cost of the component from Division X) of P in Division Y is Rs.14,06,250 on first 5,000 units and Rs.56.25 per unit in excess of 5,000 units.

Division X incurs a total cost of Rs.5,62,500 per day for an output upto 5,000 components and the total costs will increase by Rs.3,37,500 per day for every additional 5,000 components manufactured. The manager of Division X has set the transfer price for the component at Rs.90 per unit to optimize the performance of his Division.

Required:

(15 Marks)

- Prepare a divisional profitability statement at each level of output, for division X and Y separately.
- Find out the profitability of the company as a whole at the output level where:
 - Division X's net profit is maximum;
 - Division Y's net profit is maximum;
- Find out at what level of output, the company will earn maximum profit, if the company is not organized on profit centre basis.

Question 4

- "Standard Costing system is not compatible with Activity Based Costing System" Do you agree with this statement? Explain your answer. **(3 Marks)**
- How the opportunity cost for inefficient use of scarce resources be presented in variance reports under standard costing system? **(4 Marks)**
- ABC Limited provides the following information for April, 2002 :

	Budget	Actual
No. of working days	20	20
Man hours	40,000	43,000
Output per man hour (units)	3.2	3.0
Overhead – Fixed (Rs.)	32,000	31,500
- variable (Rs.)	1,02,400	1,14,000

Required:

Compute variable overhead variances, fixed overhead variances and total overhead variance **(12 Marks)**

Question 5

- What is "Price skimming policy" and at which situation it should be exercised? **(3Marks)**
- "Key objectives in accounting for spoilage are determining the magnitude of costs of spoilages and distinguishing between the costs of normal and abnormal spoilage." Discuss the statement. **(4Marks)**
- The following are cost data for three alternative ways of processing the clerical work for cases brought before the LC Court system.

	A	B	C
	Manual	Semi-automatic	Fully automatic
	Rs.	Rs.	Rs.
Monthly fixed costs:			
Occupancy	15,000	15,000	15,000
Maintenance contract	0	5,000	10,000

Equipment lease	0	25,000	1,00,000
	15,000	45,000	1,25,000
Unit variable costs (per report):			
Supplies	40	80	20
Labour	5 hrs × 40 or 200	1hr×60 or 60	0.25 hr × 80 or 20
	240	140	40

Required:

- Calculate cost indifference points. Interpret your results.
- If the present case load is 600 cases and it is expected to go up to 850 cases in near future, which method is most appropriate on cost considerations? **(12Marks)**

Question 6

- “Use of absorption costing method for the valuation of finished goods inventory provides incentive for over production”. Elucidate the statement. **(4 Marks)**
- ABC electronics makes audio player model “AB 100”. It has 80 components ABC sells 10,000 units each month at Rs.3,000 per unit. The cost of the manufacturing is Rs.2,000 per unit or Rs.200 lakhs per month for the production of 10,000 units. Monthly manufacturing cost incurred are as follows

	(Rs. Lakhs)
Direct material costs	100.00
Direct manufacturing labour costs	20.00
Machining costs	20.00
Testing costs	20.0
Rework costs	15.00
Overhead costs	0.20
Engineering costs	19.80
	<u>200.00</u>

Labour is paid on piece rate basis. Therefore, ABC considers direct manufacturing labour cost as variable cost.

The following additional information is available for “AB 100”

- Testing and inspection time per unit is 2 hours.
- 10 per cent of “AB 100” manufactured are reworked.
- It currently takes 1 hour to manufacture each unit of “AB 100”
- ABC places two orders per month for each component. Each component is supplied by different supplier.

ABC has identified activity cost pools and cost drives for each activity. The cost per unit of the cost driver for each activity cost pool is as follows:

Manufacturing Activity	Description of activity	Cost driver	Cost per unit of cost driver
1. Machine Costs	Machining components	Machine hours of capacity	Rs. 200
2. Testing costs	Testing components and finished products. (Each unit of “AB 100” is tested individually)	Testing hours	Rs.125
3. Rework costs	Correcting and fixing errors and defects	Units of “AB 100”reworked	Rs.1,500 per unit
4. Ordering cost	Ordering of components	Number of orders	Rs.125 per order
5. Engineering costs	Designing and managing of products and processes	Engineering works	Rs.1,980 per engineering hour.

Over a long run horizon, each of the overhead cost described above vary with chosen cost drivers.

In response to competitive pressure ABC must reduce the price of its product to Rs.2,600 and to reduce the cost by atleast Rs.400 per unit. ABC does not anticipate increase in sales due to price reduction. However, if it does not reduce price it will not be able to maintain the current sales level.

Cost reduction on the existing model is almost impossible. Therefore, ABC has decided to replace “AB 100” by a new model “AB 100”, which is a modified version of “AB 100”. The expected effect of design modification are as follows:

- (i) The number of components will be reduced to 50.
- (ii) Direct material cost to be lower by Rs.200 per unit.
- (iii) Direct manufacturing labour costs to be lower by Rs.20 per unit.
- (iv) Machining time required to be lower by 20 per cent.
- (v) Testing time required to be lower by 20 per cent.
- (vi) Rework to decline to 5 per cent.
- (vii) Machining capacity and engineering hours capacity to remain the same. ABC currently outsource the rework on defective units.

Required:

- (i) Compare the manufacturing cost per unit of “AB 100” and “AB 200”
 - (ii) Determine the immediate effect of design change and pricing decision on the operating income of ABC.
- Ignore income tax. Assume that the cost per unit of each cost driver for “AB 100” continues to apply to “AB 200”
- (15Marks)**

PAPER 5 : COST ACCOUNTING & COST SYSTEMS
NOVEMBER 2001

Question No.1 is compulsory
 Answer any four questions from the rest.
 Working notes should form part of the answer.

Question 1

- (a) Indicate the possible disadvantages of treating divisions as profit centres. **(4 Marks)**
 (b) What disadvantages the measurement of work has in terms of work done? **(3 Marks)**
 (c) X Ltd., has incurred losses during the past five years. Its projection for the year 2002 is also not very encouraging. The management is seriously considering the closure of the only manufacturing unit. However, it is quite open to getting the products on a sub-contracting basis and to continue its administrative and marketing functions. Currently, four products are being manufactured and sold by catering to different markets. The management is also willing to sacrifice any of these products to ensure survival. **(17 Marks)**

The projection for the four products for 2002 are :

	(Rs. in Crores)			
	A	B	C	D
Sales	72.0	54.0	84.0	60.0
Costs :				
Material	48.0	30.0	54.0	36.0
Labour	18.0	12.0	30.0	30.0
Allocated overheads:				
Manufacturing	6.0	4.8	7.2	4.8
Admins. & Selling	2.4	1.2	3.6	2.4
Total cost	74.4	48.0	94.8	73.2
Profit / (Loss)	(2.4)	6.0	(10.8)	(13.2)

The projected volume and sub-contracting charges are:

	A	B	C	D
Volume ('000 nos.)	2,000	1,500	3,000	2,000
Sub-contracting charges/unit(Rs.)	80	70	90	130

Manufacturing, administrative and selling overheads consists of staff salaries, rent, essential maintenance and tax payable to the local authorities.

In case the management decides to discontinue the manufacturing operations a minimum notice period of 3 months will be required to be given to the staff as well as to the landlords of the manufacturing unit and offices. You may assume that both the manufacturing as well as the administrative and selling overheads are fixed in nature, and that in the notice period mentioned above, these expenses would continue to be incurred.

- Assume that labour costs are related to the volume of operations and do not involve any notice period for discontinuance;
- Assume that the costs are incurred and revenues earned evenly in each of the calendar months.

Based on the above, you are required to advise the management on the best option out of the options under its considerations, viz.,

- Issue notices to the staff, the landlords of manufacturing unit and offices on the first day of the year and discontinue all the operations on that very day.
- Issue notices as above on the first day of the year and continue the operations till the end of the notice period. (only profitable products need to be continued).
- Issues notices to the staff and the landlord, only in the manufacturing unit, resort to sub-contracting and to continue the administrative and marketing functions, (sub- contracting is needed to be done of profitable products only).

Question 2

- (a) Discuss the role of costs in product – mix decisions. **(4 Marks)**
- (b) P Ltd., manufactures plastic cans of a standard size. The variable cost per can is Rs.4 and the selling price is Rs.10 each. The factory of the company has eight machines of identical size. Any individual machine can produce 30 cans per hour. The factory works on a 300 days per annum basis and the actual available hour per machine per day is 7.5. The company has an order of 4,20,000 cans from an oil company, to supply. The yearly fixed cost of the company is Rs.20 lacs. P Ltd., has received an order from another firm for supplying 60,000 nos. of plastic moulded toys. The price of the toys is Rs.60 each and the variable cost is Rs.50 each. While this order would be acceptable for supplying for total quantities only, on acceptance, a special mould costing Rs.2,25,000 would be required to be acquired to manufacture the toys. The time study exercise has revealed that 15 nos. of toys can be produced per hour by any of the machines; **(15 Marks)**

Advise the company, with reasons in the following situations :

- Whether to accept the order of manufacturing moulded toys, in addition to supplying 4,20,000 nos. of cans or not;
- Whether to accept the order of manufacturing moulded toys, if the order of cans increases to 5,40,000 nos. or not;
- While a sub-contractor is willing to supply the toys, either whole or part of the required quantities at an all inclusive rate of Rs.57.50 each, what would be the minimum excess capacity needed to justify the manufacturing of any portion of the toys order, instead of sub-contracting?
- The Company had an understanding that the orders of the cars will be increased during the year on negotiation, and planned and manufactured 4,50,000 cans during the year. for utilizing the excess capacity, they also accepted the toys order and sub-contracted only 15,000 nos. of toys. at the year's end, however, it was revealed that the order of the cans could be for 4,80,000 nos. if it was properly negotiated. how much loss has been suffered by the company due to improper prediction of demand and negotiation.

Question 3

- (a) State the distinction between Marginal costing and Absorption Costing. **(7 Marks)**
- (b) A company has two plants- one at Sambalpur and the other at Bilaspur, where production of goods takes place. **(12 Marks)**

The basic raw material requirement is 80% of the finished product, by weight. Such materials are available locally, but are limited to 6,000 M.T. at Rs.1,800 per M.T at Sambalpur and 1,6000 M.T. at Rs.2,000 per M.T. at Bilaspur. Any extra requirements will have to be procured from Jamshedpur at Rs.2,500 per M.T. Other details are as under:

	For unit at Sambalpur	For unit at Bilaspur
Annual output (M.T.)	12,000	15,000
Capacity utilization (%)	80	60
Other variables (Rs.lacs)	156	192
Fixed cost (Rs. lacs)	108	120

You are required to determine:

- the cost break up of each unit per M.T of output;
- the quantity of production at each unit from the availability of local supplies of basic raw material only, by keeping the same total production of the company, as a whole;
- cost savings, if any, as per the revised schedule of production.

Question 4

- (a) What are the reasons to determine capacity? **(5 Marks)**
- (b) Briefly discuss on curvilinear CVP analysis. **(4 Marks)**
- (c) The stock control policy of a company is that, each stock is ordered twice a year. The quantum of each order being one-half of the year's forecast demand. **(10 Marks)**

The materials manager, however, wishes to introduce a policy in which for each item of stock, reorder levels and EOQ is calculated.

For one of the items X, the following informations is available :

Forecast annual demand	3,600 units
Cost / unit	Rs.100
Cost of placing an order	Rs.40
Stock holding cost	20% of average stock value
Lead time	1 month.

It is estimated by the materials manager that for item X, a buffer stock of additional 100 units should be provided to cover fluctuations in demand.

If the new policy is adopted, calculate for stock item X:

- the reorder level that should be set by the material manager;
- the anticipated reduction in the value of the average stock investment;
- the anticipated reduction in total inventory costs in the first and subsequent years.

Question 5

- (a) State the relative economics of the “make vs. buy” decision in management control. **(7 Marks)**
- (b) C Ltd., an Indian Company, has entered into an agreement of strategic alliance with Z Inc. of United States of America for the manufacture of personal computers in India. Broadly, the terms of agreement are: **(12 Marks)**
- Z will provide C with kits in a dismantled condition. These will be used in the manufacture of the personal computer in India. On a value basis, the supply, in terms of the FOB price will be 50% thereof.
 - C will procure the balance of materials in India.
 - Z will provide to C with designs and drawings in regard to the materials and supplies to be procured in India. For this, C will pay Z a technology fee of Rs.3 crores.
 - Z will also be entitled to a royalty at 10% of the selling price of the computers fixed for sales in India as reduced by the cost of standard items procured in India and also the cost of imported kits from Z.
 - C will furnish to Z detailed quarterly returns.

Other information available :

- FOB price agreed \$ 510. Exchange rate to be adopted \$ 1 = Rs.47.059 [Note: In making calculations, the final sum may be rounded to the next rupee].
- Insurance and project – Rs.500 per imported kit;
- Customs duty leviable is 150% of the CIF prices; but as a concession, the actual rate leviable has been fixed at 30% of CIF;
- The technology agreement expires with the production of 2,00,000 computers.
- The quoted price on kits includes a 20% margin of profits on cost to Z;
- The estimated cost of materials and supplies to be obtained in India will be 140% of the cost of supplies made by Z.
- 48% of the value in rupees of the locally procured goods represent cost of the standard items.
- Costs of assembly and other overheads in India will be Rs.2,000 per personal computer.

Required: Calculate the selling price of a personal computer in India bearing in mind that C has targeted a profit of 20% to itself on the selling price.

Question 6

- (a) What are the differences between Cost Control and Cost Reduction ? Discuss. **(8 Marks)**
- (b) A company manufactures two types of herbal product, A and B. Its budget shows profit figures after apportioning the fixed cost of Rs.15 lacs in the proportion of the numbers of units sold. The budget for 2002, indicates; **(11 Marks)**

	A	B
Profit (Rs.)	1,50,000	30,000
Selling price / unit (Rs.)	200	120
P/V ratio (%)	40	50

You are required to advise on the best option among the following , if the company expects that the number of units to be sold would be equal.

- (i) Due to change in a manufacturing process, the joint fixed cost would be reduced by 15% and the variable would be increased by 7 ½%;
- (ii) Price of A could be increased by 20% as its is expected that the price elasticity of demand would be unity over the range of price;
- (iii) Simultaneous introduction of both the options, viz., (i) and (ii) above.

PAPER 5 : COST ACCOUNTING & COST SYSTEMS
MAY 2001

Question No.1 is compulsory
 Answer any four questions from the rest.
 Working notes should form part of the answer.

Question 1

- (a) State the non-cost factors to be considered in make / buy decisions. **(4 Marks)**
 (b) What is Penetration Pricing? What are the circumstances in which this policy can be adopted ? **(4 Marks)**
 (c) A company manufactures two products P and Q. Both the products pass through the company's two departments, A and B. The market demand for a month is 2,500 units of P and 2,000 units of Q. The company has a normal capacity of 600 hours in department A and 520 hours in department B per month. Overtime is acceptable upto 50% of normal hours in each department. The details relating to the products are as under:

	Products	
	P	Q
Direct material cost per unit	Rs.10	5
Fixed overheads per month	Rs.18,000	6,400
	Departments	
	A	B
Direct labour time per unit (minutes)		
Product : P	6	12
Q	18	12
Direct wage rate per hour		
Normal time	Rs.10	12
Overtime	Rs.15	18

In the event of the company not being able to fulfill the demand for want of capacity, the balance quantity of the products can be sold by buying from a sub-contractor, who has agreed to supply product P at Rs.18 and product Q at Rs.12 per unit.

Required :

- (i) Calculate the quantity of each product to be manufacture and / or to be sub-contracted in a most economical way of fulfilling the market demand.
 (ii) Present a statement showing the total costs involved in your solution (i) above.

Question 2

- (a) Comment on the use of opportunity cost for the purpose of : **(4 Marks)**
 i. Decision – making; and
 ii. Cost control.
 (b) State three applications of direct costing. **(3 Marks)**
 (c) A company had nearly completed a job relating to construction of a specialized equipment, when it discovered that the customer had gone out of business. at this state, the position of the job was as under: **(12 Marks)**

	Rs.
Original cost estimated	1,75,200
Cost incurred so far	1,48,500
Costs to be incurred	29,700
Progress payments received from original customer	1,00,000

After searches, a new customer for the equipment has been found. He is interested to take the equipment, if certain modifications are carried out. The new customer wanted the equipment in its original condition, but without its control device and with certain other modifications. The costs of these additions and modifications are estimated as under:

Direct materials (at cost)	Rs.1,050
Direct wages Deptt. A	15 man days
Deptt. B	25 man days
Variable overheads	25% of direct wages in each department
Delivery costs	Rs.1,350

Fixed overheads will be absorbed at 50% of direct wages in each department.

The following additional information is available:

- (1) The direct materials required for the modification are in stock and if not used for modification of this order, they will be used in another job in place of materials that will now cost Rs.2,250.
- (2) Department A is working normally and hence any engagement of labour will have to be paid at the direct wage rate of Rs.120 per man day.
- (3) Department B is extremely busy. Its direct wage rate is Rs.100 per man day and it is currently yielding a contribution of Rs.3.20 per rupee of direct wages.
- (4) Supervisory overtime payable for the modification is Rs.1,050.
- (5) The cost of the control device that the new customer does not require is Rs.13,500. If it is taken out, it can be used in another job in place of a different mechanism. The latter mechanism has otherwise to be bought for Rs.10,500. The dismantling and removal of the control mechanism will take one man day in department A.
- (6) If the convention is not carried out, some of the materials in the original equipment can be used in another contract in place of materials that would have cost Rs.12,000. It would have taken 2 man days of work in department A to make them suitable for this purpose. The remaining materials will realize Rs.11,400 as scrap. The drawings, which are included as part of the job can be sold for Rs.1,500.

You are required to calculate the minimum price, which the company can afford to quote for the new customer as stated above.

Question 3

- (a) Define defectives and state their treatment in Cost Accounts. **(4 Marks)**
- (b) Enumerate the factors involved in decision relating to expansion of capacity. **(3 Marks)**
- (c) A Company is engaged in the manufacture of edible oil. It has three divisions as under: **(12 Marks)**
 - i. Harvesting oil seeds and transportation thereof to the oil mill.
 - ii. Oil Mill, which processed oil seeds and manufacture edible oil.
 - iii. Marketing Division, which packs the edible oil in 2 kg. containers for sale at Rs.150 each container.

The Oil Mill has a yield of 1,000 kgs of oil from 2,000 kg of oil seeds during a period. The Marketing Division has a yield of 500 cans of edible oil of 2 kg. each from every 1,000 kg. of oil. The net weight per can is 2 kg. of oil.

The cost data for each division for the period are as under:

Harvesting Division :	
Variable cost per kg. of oil seed	Rs.2.50
Fixed cost per kg. of oil seed	Rs.5.00
Oil Mill Division :	
Variable cost of processed edible oil	Rs.10.00 per kg.
Fixed cost of processed edible oil	Rs.7.50 per kg.
Marketing Division	
Variable cost per can of 2 kg. of oil	Rs.3.75
Fixed cost per can of 2 kg of oil	Rs.8.75

The fixed costs are calculated on the basis of the estimated quantity of 2,000 kg. of oil seeds harvested, 1,000 kg. of processed oil and 500 cans of edible oil packed by the aforesaid divisions respectively during the period under review.

The other oil mills buy the oil seeds of same quality at Rs.12.50 per kg. in the market. The market price of edible oil processed by the oil mill, if sold without being packed in the marketing division is Rs.62.50 per kg. of oil.

Required :

- (i) Compute the overall profit of the company of harvesting 2,000 kg of oil sees, processing it into edible oil and selling the same in 2 kg. cans as estimated for the period under review.
- (ii) Compute the transfer prices that will be used for internal transfers from (1) Harvesting Division to Oil Mill Division and (2) from Oil Mill Division to Marketing Division under the following pricing methods.
 1. shared contribution in relation to variable costs; and
 2. market price.
- (iii) Which transfer pricing method will each divisional manager prefer to use?

Question 4

- (a) Explain with one example each that sunk costs is irrelevant in making decisions, but irrelevant costs are not sunk costs. **(2 Marks)**
- (b) State the features of Partial Plan of Standard Cost Accounting Procedure. **(4 Marks)**
- (c) The following is the Operating Statement of a company for April, 2001: **(13 Marks)**

				Rs.
	Budgeted profit			1,00,000
	Variances :	Favourable Rs.	Adverse Rs.	
	Sales Volume		4,000	
	Price	9,600		
	Direct Material - Price		4,960	
	Usage		6,400	
	Direct Labour - Rate		3,600	
	Efficiency	3,600		
	Rate Overheads- Efficiency	2,400		
	Capacity		4,000	
	Expense	1,400		
		17,000	22,960	5,960A
	Actual profit			94,040

Additional information is as under:

Budget for the year 1,20,000 units
 Budgeted fixed overheads Rs.4,80,000 per annum.

Standard cost of one unit of product is :

Direct materials 5 kg @ Rs.4 per kg.
 Direct labour 2 hours @ Rs.3 per hour.

Fixed overhead are absorbed on direct labour hour basis.

Profit 25% on sales.

You are required to prepare the Annual Financial Profit / Loss Statement for April, 2001 in the following format:

Account	Qty./Hrs.	Rate / Price	Actual value Rs.
Sales			
Direct Materials			
Direct Labour			
Fixed Overhead			
Total costs			
Profit			

Question 5

- (a) Discuss the scope of cost reduction in the area of works services. **(5 Marks)**
- (b) What are the pre-requisites of responsibility accounting? **(4 Marks)**
- (c) In 19×1 , the turnover of a company, which operated at a margin of safety of 25% amounted to Rs.9,00,000 and its profit volume ratio was $33 \frac{1}{3}\%$. During 19×2 , the company estimated that although the same volume of sales as in 19×1 would be maintained, the sales value would go down due to decrease in selling price. There will be no change in variable costs. The company proposes to reduce its fixed costs through an intensive cost reduction programme. These changes will alter the profit volume ratio and margin of safety to 30% and 40% respectively in 19×2 .
Even if the company closed down its operations in 19×2 , it would incur a minimum fixed cost of Rs.50,000.
Required :
- Present a comparative statement indicating the sales, variable costs, fixed costs and profit for 19×1 and 19×2 .
 - At what minimum sales will the company be better off by locking up in business in 19×2 ?

Question 6

- (a) What is Management Control System? State three essential characteristics of a Sound Management Control System. **(5 Marks)**
- (b) Enumerate the limitations of using the marginal costing technique. **(5 Marks)**
- (c) A company operates its plant on single shift basis. It can produce upto 8,000 units of output per month without overtime. The fixed costs on single shift basis of operation amount to Rs.30,00 per month. The average variable cost per units is Rs.10. **(9 Marks)**
The output can be increased upto 15,000 units per month by working overtime. This entails no increase in fixed costs, but the variable costs per unit during overtime will be Rs.12 in excess of 8,000 units upto the capacity of 15,000 units.
If a second shift is worked, the maximum capacity of the second shift is 8,000 units per month. The variable cost on second shift operation is Rs.10.50 per unit and the incremental fixed cost involved in the second shift is Rs.6,000 per month.
Required :
- If the company's demand for the product is 10,000 units, should the company work overtime or second shift ?
 - At what level of output will the company consider working second shift instead of working overtime? State the range of output for overtime working and second shift operation.
 - During a particular month, the company predicted its demand to be 14,000 units and worked second shift. At the end of the month it was discovered that the company's demand was only 11,000 units and the company accordingly produced only 11,000 units. Calculate the cost of prediction error.

PAPER 5 : COST ACCOUNTING & COST SYSTEMS
NOVEMBER 2000

Question No.1 is compulsory

Answer any **four** questions from the rest.

Working notes should form part of the answer.

Question 1

- (a) What is Target Costing and what are the stages to the methodology? **(4 Marks)**
 (b) What are the areas in which Activity based information is used for decision making? **(4 Marks)**
 (c) B Ltd., is a company that has, in stock, materials of type XY that costs Rs.75,000, but that are now obsolete and have a scrap value of only Rs.21,000. Other than selling the material for scrap, there are only two alternative uses for them. **(16 Marks)**

Alternatively 1 –Converting the obsolete materials into a specialized product, which would require the following additional work and materials:

Material A	600 units
Material B	1,000 units
Direct Labour	
5,000 hours unskilled	
5,000 hours semi-skilled	
5,000 hours highly skilled	
Extra selling and delivery expenses	Rs.27,000
Extra advertising	Rs.18,000

The conversion would produce 900 units of saleable product and these could be sold for Rs.300 per unit.

Material A is already in stock and is widely used within the firm. Although present stocks, together with orders already planned, will be sufficient to facilitate normal activity and extra material used by adopting this alternative will necessitate such materials being replaced immediately. Material B is also in stock, but it is unlikely that any additional supplies can be obtained for some considerable time, because of an industrial dispute. At the present time material B is normally used in the production of product Z, which sells at Rs.390 per unit and incurs total variable cost (excluding Material B) of Rs.210 per unit. Each unit of product Z uses four units of material B. The details of Materials A and B are as follows:

	Material AB (Rs.)	Material B (Rs.)
Acquisition cost at the time of purchase	100 per unit	Rs.10 per unit
Net realizable value	85 per unit	Rs.18 per unit
Replacement cost	90 per unit	---

Alternative 2 :Adopting the obsolete materials for use as a substitute for a sub assembly that is regularly used within the firm. Details of the extra work and materials required are as follows:

Material C	1,000 units
Direct labour:	
4,000 hours unskilled	
1,000 hours semi-skilled	
4,000 hours highly skilled	

1,200 units of the sub-assembly are regularly used per quarter at a cost of Rs.900 per unit. The adaptation of material XY would reduce the quantity of the sub-assembly purchased from outside the firm to 900 units for the next quarter only. However, since the volume purchased would be reduced, some discount would be lost and the price of those purchased from outside would increase to Rs.1,050 per unit for that quarter.

Material C is not available externally though 1,000 units required would be available from stocks, it would be produced as extra production. The standard cost per unit of Material C would be as follows:

	Rs.
Direct labour : 6 hours unskilled labour	18
Raw materials	13

Variable overhead : 6 hours at Re.1	6
Fixed overhead : 6 hours at Re.	<u>18</u>
	<u>55</u>

The wage rates and overhead recovery rates for B Ltd., are:

Variable overhead	Re.1 per direct labour hour
Fixed overhead	Rs.3 per direct labour hour
Unskilled labour	Rs.3 per direct labour hour
Semi-skilled labour	Rs.4 per direct labour hour
Highly skilled labour	Rs.5 per direct labour hour

The unskilled labour is employed on a casual basis and sufficient labour can be acquired to exactly meet the production requirements. Semi-skilled labour is part of the permanent labour force, but the company has temporary excess supply of this type of labour at the present time. Highly skilled labour is in short supply and cannot be increased significantly in the short term, this labour is presently engaged in meeting the demand for product L, which requires 4 hours of highly skilled labour. The contribution from the sale of one unit of product L is Rs.24.

Given the above information, you are required to present cost information advising whether the stocks of Materials XY should be sold, converted into a specialized product (Alternative 1) or adopted for use as a substitute for a sub-assembly (Alternative 2)

Question 2

(a) What do you mean by philosophy of continuous process improvement ? What are its challenges?

(6 Marks)

(b) P.W. Perfume Company manufactures various qualities of perfumes and colognes. One popular line of colognes includes three products that result from a joint production process. Below are data from the most recent month of production:

Product	Sales price	Quantity	Joint cost	Cost After Split Off	Total cost
Evergreen	Rs.40	10,000	Rs.28	Rs.20	Rs.48
Morning flower	Rs.100	6,000	Rs.28	Rs.40	Rs.68
Evening flower	Rs.150	4,000	Rs.28	Rs.50	Rs.78

As the Controller, you are called into the President's Office with the Director of Marketing. The President says, "I don't understand your product cost report. Either, we are selling our largest volume product at a loss or the product cost data are all wrong. Now what is it?"

Required :

- Respond to the President's question.
- Another Company has just introduced a product that competes directly with Morning Flower. To compete successfully with the other company's product, the price of morning flower cologne must be reduced to Rs.60. Should the company do so and sell below cost?
- If P.W. Perfume Company has a policy of maintaining a gross margin of 20 per cent on sales, what would your answer be in response to the price reduction in part (ii)?
- What is the minimum price for which Morning Flower can sell and still meet the 20 per cent product gross margin for the group of products?

Question 3

(a) What will be the marketable transfer pricing procedure regarding the goods transferred under the following conditions (each condition is independent of the other)?

(3 Marks)

- When divisions are not captives of internal divisions and the divisions are free to do business both internally and externally and when there are reasonably competitive external markets for the transferred products.

- ii. If the external market for the transferred good is not reasonably competitive.
- (b) Discuss the potential for maximization of income by a multinational through the use of transfer pricing mechanism. **(3Marks)**
- (c) City Instrument Company (CIC) consists of the Semi-conductor Division and the Mini-computer Division, each of which operates as an independent profit centre. Semi – conductor Division employs craftsmen, who produce two different electronic components, the new-high performance Super-chip and an order product called Okay-chip. These two products have the following cost characteristics:

(13 Marks)

	Super – chip		Okay - chip	
Material	Parts	Rs.20	Parts	Rs.10
Labour	2 hours × Rs.140	280	½ hour × Rs.140	70

Annual Overhead in Semi-conductor Division is Rs.40,00,000 all fixed. Owing to high skill level necessary for the craftsmen, the semi-conductor Division's capacity is set at 50,000 hours per year.

To date, only one customer has developed a product utilizing super –chip, and this customer orders a maximum of 15,000 super – chips per year at a price of Rs.600 per chip. If CIC cannot meet his entire demand, the customer curtails his own production. The rest of the semi-conductor's capacity is devoted to Okay-chips, for which there is unlimited demand at Rs.120 per chip.

The mini-computer division produces only one product, a process control unit, which requires a complex circuit board imported at a price of Rs.600. The control unit's costs are:

	Control unit	
Material	Circuit board	Rs.600
	Other parts	80
Labour	5 hours at Rs.100	500

The mini-computer division is composed of only a small assembly plant and all overhead is fixed at a total of Rs.8,00,000 per year. The current market price for the control unit is Rs.1,400 per unit.

A joint research project has just revealed that with minor modifications, a single super-chip could be substituted for the circuit board currently used by the mini – computer division. The modification would require an extra one hour of labour by mini-computer's staff, for a total of 6 hours per control unit. Mini-computer has therefore asked semi-conductor division to declare a transfer price at which semi-conductor division would sell super-chip internally.

Required :

- Mini—computer expects to sell 5,000 control units this year. From the overall view point of CIC, how many super-chips should be transferred to Mini-computer Division to replace circuit boards?
- If the demand for the control unit is sure to be 5,000 units, but its price is uncertain, what should be the transfer price of super-chip to ensure proper decisions? (All other data unchanged).
- If demand for the control unit rises to 12,000 units at a price of Rs.1,400 per unit, how many of 12,000 units should be built using super-chip? (All other data unchanged)

Question 4

- (a) "Standard costing variances centre around comparison of Actual Performance with the standard and the standards or plans are normally based on the environment anticipated when the targets are set and if the current environment is different from that anticipated, such analysis cannot measure managerial performance." Comment on the statement and how will you deal with the situation with reference to material, labour and sale variances. **(6 Marks)**
- (b) F Manufacturing Ltd., uses the three variances method to analyze the manufacturing overhead variances. Manufacturing overhead variances for the fiscal year just ended were computed as follows: **(13 Marks)**

Spending	Rs.86,000	Adverse
Efficiency	Rs.36,000	Favourable
Volume	Rs.80,000	Favourable

The manufacturing overhead application rate for the year was Rs.160 per machine hours of which Rs.60 per machine hour was the variable component. The year end balance in the Manufacturing Overhead Control Account was Rs.16,50,000 and the standard machine hour for the year were 11,300.

From the above data compute:

- (i) Budgeted Machine Hours
- (ii) Actual Machine Hours.
- (iii) Applied Manufacturing Overhead
- (iv) Total Amount of Fixed Overheads Cost.

Question 5

- (a) "In job order costing, the costs of specific normal spoilage are charged to specific jobs." Do you agree? Explain. **(3 Marks)**
- (b) Describe two pricing practices in which non-cost reasons are important, when setting prices. **(3 Marks)**
- (c) What is bench marketing technique so far as products and operations are concerned? Can you describe the bench marking process? **(4 Marks)**
- (d) M Company's Central Service Department is evaluating new copying machines to replace the firm's current copier, which is worn out. The analysis of alternative machines has been narrowed to three and the estimated costs of operating them are shown below:

	Cost per 100 copies		
	Machine A	Machine B	Machine C
	Rs.	Rs.	Rs.
Material cost	60	40	20
Labour cost	80	30	20
Annual lease cost	30,000	58,000	1,00,000

Required :

- (i) Compute the cost indifference points for the three alternatives.
- (ii) What do the cost indifference points suggest as a course of action in this regard?
- (iii) If the management expects to need 87,000 copies next year, which copier would be most economical?

Question 6

- (a) Cost reduction efforts frequently focus on two key areas? What are they? **(4 Marks)**
- (b) Explain, how Cost Volume Profit (CVP) – based sensitivity analysis can help managers cope with uncertainty. **(4 Marks)**
- (c) A Co., Ltd., manufactures several different styles of jewellery cases. Management estimates that during the third quarter, the company will be operating at 80 per cent of the normal capacity. Because the company desires a higher utilization of plant capacity, the company will consider a special order. The company has received special order inquiries from two companies. The first order is from JCP Co. Ltd., which would like to market a jewellery case similarly to one of A Co., Ltd.'s jewellery cases. JCP jewellery case would be marketed under JCP's own label. JCP Co. Ltd., has offered A Co. Ltd., Rs.57.50 per jewellery case for 20,000 cases to be shipped by the last date of the quarter. The cost data for A Co. Ltd., jewellery case that would be similar to the specifications of JCP special order are as follows;

	Rs.
Regular selling price per unit	90
Costs per unit	
Raw materials	25
Direct labour 0.5 hour @ Rs.60	30
Overhead 0.5 machine hour @ 40	10
Total costs	<u>65</u>

According to the specifications provided by JCP Co., Ltd., the special order case requires less expensive raw materials. Consequently the raw materials will only cost Rs.22.50 per case. Management has estimated that the remaining costs, labour time and machine time will be the same as for A Co., Ltd., jewellery case.

The second special order was submitted by K Co., Ltd., for 7,500 jewellery cases at Rs.75.75 per case. These jewellery cases, like the JCP cases, would be marketed under K label and have to be shipped by the last date of the quarter. However, the K jewellery case is different from any jewellery case in the A Co., Ltd. line. The estimated per unit cost of this case are as follows:

	Rs.
Raw materials	32.50
Direct labour 0.5 hour @ Rs.60	30.00
Overhead 0.5 machine hour @ Rs.40	<u>20.00</u>
Total costs	<u>82.50</u>

In addition, A Co., Ltd., will incur Rs.15,000 in additional setup costs and will have to purchase a Rs.25,000 special device to manufacture these cases, this device will be discarded once the special order is completed.

The A Co. Ltd.'s manufacturing capabilities are limited to the total machine hours available. The plant capacity under normal operations is 90,000 machine hours per year or 7,500 machine hours per month. The budgeted fixed overhead costs are applied to production on the basis of machine hours at Rs.40 per hour.

A Co., Ltd., will have the entire quarter to work on the special orders. Management does not expect any repeat sales to be generated from either special order. Company practice precludes from subcontracting any portion of an order, when special orders are not expected to generate repeat sales.

Required: Should A Co., Ltd., accept either special order? Justify your answer and show the calculations.

PAPER 5: COST MANAGEMENT
MAY 2000

Question 1 is compulsory.
Answer any four from the rest.
Working notes should form part of your answer.

Question 1

- (a) Describe the importance of value analysis in cost reduction. **(4 Marks)**
 (b) Mention few areas of material cost control **(4 Marks)**
 (c) GG Ltd. Manufactures and sells an equipment called water purifier. The cost data for each batch of ten numbers of water purifier is as follows:

Components	A	B	C	D	E
Machine Hours	20	28	24	-	-
Labour Hours	--	-	-	4	2
	Rs.	Rs.	Rs.	Rs.	Rs.
Variable Costs	64	108	116	24	8
Fixed Costs as apportioned	36	52	64	26	22

Assembly costs (all variable) Rs.50 per batch.

Selling price Rs.800 per batch.

Maximum available machine capacity for making components A,B and C is 10,800 hours and it cannot be increased further. Labour is available for making components D and E and for assembling the product.

Estimated increase in demand next year is 50% and fixed costs in general may increase by Rs.10,000.

In order to release production capacity to meet increased market demand, the company decided to purchase one of the machine made components.

Quote Ltd., only supplier of components A, B and C. Because of incomplete records, it is unable to quote single figure prices. Its quotation is as follows:

Component	Pessimistic view Rs.	Probability	Most likely view Rs.	Probability	Optimistic view Rs.	Probability
A	120	0.25	110	0.5	80	0.25
B	200	0.25	130	0.5	140	0.25
C	160	0.25	140	0.5	120	0.25

It is agreed between the companies that the price of each of the components will be determined on an overall basis based on information found in the quotation.

You are required to :

- (i) Indicate, in the context of key factory, the maximum number of batches that could be produced, if each of the three alternatives namely buying A or B or C is considered. **(8 Marks)**
 (ii) Analyze the financial implication of purchase and advise which component is to be bought keeping in view the fact that production capacity will be limited to a 50% increase. **(4 Marks)**
 (iii) Prepare a Profit Statement for the period assuming that the component chosen by you is bought out and extra production is made and sold. **(4 Marks)**

Question 2

- (a) What is activity based costing? **(4 Marks)**
 (b) What are the applications of incremental cost techniques in making managerial decisions? **(5 Marks)**
 (c) AB Ltd., manufactures product "X". The company operates a single shift of 8 hours for 300 days in a year. The capital employed in the business is Rs.18 crores. **(10 Marks)**

The manufacturing operations of the company comprise of four production departments. The company at present produces 9,000 units of product "X" at maximum capacity. However the capacity utilization of all the four departments are not equal and the present individual capacity utilizations are as under:

Department	Capacity utilization
A	75
B	100
C	70
D	50

The present return on capital of the company has gone down to 10% from the earlier cut-off rate of 15% due to increased cost of production.

As the company cannot operate more than one shift, the management is considering two alternative proposals to increase the return on capital employed.

The two alternatives are:

Alternative I:

To hire out the surplus capacity of departments A, C and D. The cost and revenue projections are as under:

Department	Hire charges per hour	Incremental cost per hour
	Rs.	Rs.
A	2,500	2,000
C	1,800	1,500
D	1,600	1,200

Alternative II:

To increase the installed capacity of the factory to 12,000 units by adding plant and machinery in department B at a capital cost of Rs.4 crore. Any balance surplus capacity in other departments after meeting the increased volume to be hired out as per alternative I. The additional units would fetch an incremental revenue of Rs.1,600 per unit.

You are required to evaluate the two proposals and suggest to the management which of the two proposals is to be accepted.

Question 3

(a) Explain the concept of cost plus pricing. What are its advantages and disadvantages? **(8 Marks)**

(b) A company produces main product "Super" and a co-product "Mild". The main product is sold entirely to its collaborator, but the product "mild" is sold at the local market. The company increased its capacity as a result of which the output of "Mild" increased to 15,000 m/t per annum at a price of Rs.1,000 pt. **(11 Marks)**

However in the face of increased competition to sell the entire o of 15,000 m/t of "Mild" the company will have to reduce the sale price by Rs.50 pt. every year for next 5 years and thereafter the price will stabilize at Rs. 750 pt.

As an alternative, the company can convert "Mild" into "Medium" at a variable cost of Rs.200 per (metric) tonne. However to enter the sale price will have to be Rs.1,200 pt. in the first year and Rs.1,30 pt. in the second year.

The sale of Medium will be 1,000 m/t in the first year and there upon going up by 1,000 m/t each year. The company will have to invest Rs.30 lakhs in capital outlay to produce "Medium".

You are required to present the projected sales volume (quantity and value) of products "Mild" and "Medium" and also appraise the investment of Rs.30 lakhs at 12% per annum for the period of next 5 years.

Year	1	2	3	4	5
Present value of Rupee one at 12% p.a.	0.89	0.79	0.71	0.64	0.57

Question 4

- (a) Briefly explain the methods of separating semi-variable costs into their fixed and variable elements. **(6 Marks)**
- (b) Division Z is a profit centre, which produces four products – A, B C and D. Each product is sold in the external market also. Data for the period is as follows: **(13 Marks)**

	A	B	C	D
Market price per unit Rs.	150	146	140	130
Variable cost of production per unit Rs.	130	100	90	85
Labour hours required per unit	3	4	2	3

Product D can be transferred to division Y, but the maximum quantity that might be required for transfer is 2,500 units of D.

The maximum sales in the external market are:

- A 2,800 units
- B 2,500 units
- C 2,300 units
- D 1,600 units

Division Y can purchase the same product at a slightly cheaper price of Rs.125 per unit instead of receiving transfers of product D from Division Z.

What should be the transfer price for each unit for 2,500 units of D, if the total labour hours available in division Z are:

- (i) 20,000 hours?
- (ii) 30,000 hours ?

Question 5

- (a) Describe three distinct group of variances that arise in standard costing. **(6 Marks)**
- (b) The working results of a company for two corresponding years are shown below:

	Year 1 (Rs.in lakhs)	Year 2 (Rs.in lakhs)
Sales	1,200	1,240
Direct material	600	648
Direct wages and variable overheads	360	412
Fixed overheads	160	300
	1,120	1,360
Profit	80	180

In year 2, there has been an increase in the selling price by 10%. Following are the details of material consumption and utilization of direct labour hours during the two years.

	Year 1	Year 2
Direct material consumption in m/t	5,00,000	5,40,000
Direct labour hours	75,00,00	80,00,00

You are required to :

- (i) Keeping year 1 as base year, analyze the results of year 2 and work out the amount which each factor has contributed to change in profit. **(9 Marks)**
- (ii) Find out the break even sales for both years. **(2 Marks)**
- (iii) Calculate the percentage increase in selling price that would be needed over the sale value of year 2 to earn a margin of safety of 45%. **(2 Marks)**

Question 6

- (a) In what circumstances it may be justifiable to sell at a price below marginal cost? **(4 Marks)**

- (b) "Cost is not the only criterion for deciding in favour of shut down" – Briefly explain. **(3 Marks)**
- (c) Unique Products manufactures and sells in a year 20,000 units of a particular product to definite customers at a price of Rs.100 per unit. the concern has a capacity to produce 25,000 units of the product per annum. To produce beyond 25,000 units per annum, the concern will have to install a new equipment at a cost of Rs.15 lakhs. The equipment will have a life span of 10 years and will have no residual value. There is an offer from a client to purchase 10,000 units of the product regularly at a price of Rs.90 per unit. The order, if accepted, will have to be over and above the existing level of production of 20,000 units. The cost structure is as under:

	Per unit
	Rs.
Direct material	30
Direct labour	20
Variable overhead	10
Profit	20

During the coming year, it has been estimated that the cost of the direct material, as compared to the current year will increase by 10%. Because of certain wage agreement direct labour cost will increase by 25% . Fixed overheads will increase by 10%. If the new order for 10,000 units is accepted, fixed overheads will increase further by Rs.60,000 due to increased administrative charges.

You are required to analyze whether the concern should accept the order or instead of that try to secure order for the balance unused capacity, as available now, through some sales promotion expenses which will be Rs.50,000 per annum. Ignore financial charges for the new investment.

- (d) A firm furnishes the following information : **(4 Marks)**

Capacity in units	Unit cost	Unit price
	Rs.	Rs.
2,000	40	100
3,000	35	95
4,000	34	94
5,000	32	--
6,000	31	--

At present the firm is operating at 4,000 units capacity and has received an order for 2,000 units from an export market at Rs.28 per unit. Should the order be accepted?

PAPER 5 : COST MANAGEMENT**November 1999**

Question No.1 is compulsory

Answer any four questions from the rest.

Working notes should form part of the answer.

Question 1

- (a) Discuss the relationship between Angle of Incidence, Break-even Level and Margin of Safety. **(8 Marks)**
- (b) Satish Enterprises are leading exporters of Kid's Toys. J Ltd. of U.S.A. have approached Satish Enterprises for Exporting a special toy named "Jumping Monkey". The order will be valid for next three years at 3,000 toys per month. The export price of the toy will be \$4.

Cost data per toy is as follows :

	Rs.
Materials	60
Labour	25
Variable overheads	20
Primary packing of the toy	15

The toys will be packed in lots of 50 each. For this purpose a special box, which will contain the 50 toys will have to be purchased, cost being Rs. 400 per box.

Satish Enterprises will also have to import a special machine for making the toys. The cost of the machine is Rs. 24,00,000 and duty thereon will be at 12%. The machine will have an effective life of 3 years and depreciation is to be charged on straight line method. Apart from depreciation, annual fixed overheads is estimated at Rs. 4,00,000 for the first year with 6% increase in the second year. Fixed overheads are incurred uniformly over the year.

Assuming the average conversion rate to be Rs. 50' per \$, you are required to :

- Prepare a monthly and yearly profitability statements for the first year and second year assuming the production at 3,000 toys per month. **(6 Marks)**
- Compute a monthly and yearly break – even units in respect of the first year. **(4 Marks)**
- In what contingency can there be a second break even point for the month and for the year as a whole? **(4 Marks)**
- Have you any comments to offer on the above? **(2 Marks)**

Question 2

- (a) Explain the concept of Relevant Costs. **(5 Marks)**
- (b) 'Mention any four important factors to be considered in Marginal Costing Decisions. **(4 Marks)**
- (c) Ranka Builders has been offered a contract by Excel Ltd. to build for it five special Guest Houses for use by top management. Each Guest House will be an independent one. The contract will be for a period of one year, and the offer price is Rs. one crore. In addition, Excel Ltd. will also provide 2 grounds of land free of cost for purpose of construction. The Chief Accountant of Ranka Builders has prepared an estimate on the basis of which he has advised that the contract should not be accepted at the price offered. His estimate was as follows: **(10 Marks)**

	Rs in Lacs
Land (3 Grounds at Rs. 20 lacs each)	60
Drawings and Design	7
Registration	10
Materials:	
Cement and Sand	6
Bricks and Tiles	4
Steel	10
Others (including interior decoration)	10
Labour -Skilled	12

Unskilled	8
Supervisor's Salary	5
Overheads General	12
Depreciation	6
Total Cost	150

The Accountant also provides the following information :

Land : The total requirement of land is 3 grounds costing Rs.20 lacs per ground. Excel Ltd. will provide 2 grounds free of cost.

Drawing and Design: These have already been prepared and 50% of the cost has already been incurred.

Materials:

- Cement and sand are already in stock and are in regular use. If used for this contract, they have to be replaced at a cost of Rs. 8 lacs.
- Bricks and tiles represent purchases made several months before for a different contract. They could be sold readily for a net Rs. 5 lacs after meeting all further expenses.
- Others: Materials worth Rs. 2 lacs relating to interior decoration are in stock for which no alternative use is expected in the near future. However they can be sold for Rs. 1 lac.

Labour:

- Skilled workers will be transferred to this project from another project. The Project Manager claimed that if the men were returned to him, he could have earned the company an additional Rs. 2 lacs in terms of profits.
- The supervisor undertakes various tasks in the sites and his pay and continuity of employment will not be affected by the new contract. If the contract is taken, he will devote half of his time.

Overheads :

- The equipment that would be used on the contract was bought one year before for Rs. 30 lacs and is expected to last for five years. It can also be used on other contracts and the current replacement price will be Rs. 32 lacs and in a year's time it will be Rs. 25 lacs.
- The general overheads includes both specific and absorbed overheads. If the contract is not undertaken, Rs. 4 lacs of the same can be avoided.

Ranka Builders has also on hand another project, which would not be executed if the contract from Excel Ltd. were to be accepted. The estimated profit on that project is Rs. 10 lacs.

In the light of information given above, you are required to indicate with reasons whether the contract from Excel Ltd. should be accepted or not.

Question 3

(a) "Transfer pricing is a widely debated and contested topic"-Discuss. (5 Marks)

(b) What should be the basis of transfer pricing, if unit variable cost and unit selling price are not constant ? (4 Marks)

(c) Chum Chum Ltd. is about to introduce a new product with the following estimates:

Price per Unit in Rupees	Demand (in thousand units)
30-00	400
31-50	380
33-00	360
34-50	340
36-00	315
37-50	280
39-00	240

Cost

Direct material	Rs.12 per unit
Direct labour	Rs.3 per unit

Variable overhead	Rs.3 per unit
Selling expenses	10% on sales
Fixed production overheads	Rs.14,40,000
Administration expenses	Rs.10,80,000

Judging from the estimates, determine the tentative price of the new product to earn maximum profit

Question 4

- (a) Explain the concept of discretionary costs. Give three examples. **(4 Marks)**
- (b) Discuss, how control may be exercised over discretionary costs. **(5 Marks)**
- (c) Veejay Ltd. makes and sells two products, Vee and Jay. The budgeted selling price of Vee is Rs. 1,800 and that of Jay is Rs. 2,160. Variable costs associated, with producing and selling the Vee are Rs. 900 and with Jay, Rs. 1,800. Annual fixed production and selling costs of Veejay Ltd. are Rs. 88,000. The company has two production / sales options. The Vee and Jay can be sold either in the ratio of two Vees to three Jays or in the ratio of one Vee to two Jays. What will be the optimal mix and why? **(10 Marks)**

Question 5

- (a) Mention the causes that give rise to labour rate variance. **(5 Marks)**
- (b) Following is the standard cost card of a component: **(14 Marks)**

Materials	2 units at Rs.15	Rs.30
Labour	3 hours at Rs.20	Rs.60
Total overheads	3 hours at Rs.10	Rs.30

During a particular month 10,000 units of the component were produced and the same was found to be at 60% capacity of the budget. In preparing the variance report for the month, the cost accountant gathered the following information:

Labour	Rs.6,50,000
Variable overheads	Rs.2,00,000
Fixed overheads	Rs.3,00,000
Material price variance	Rs.70,000 (A)
Material cost variance	Rs.50,000 (A)
Labour rate variance	Rs.50,000 (F)
Fixed overhead expenditure variance	Rs.50,000 (A)

You are required to prepare from the above details :

- (1) Actual material incurred.
- (2) Standard cost of materials actually consumed
- (3) Labour efficiency variance
- (4) Variable OH efficiency variance
- (5) Variable OH expenditure variance
- (6) Fixed OH efficiency variance
- (7) Fixed OH capacity variance
- (8) Fixed OH volume variance.

Question 6

- (a) Distinguish between Cost Control and Cost Reduction. **(6 Marks)**
- (b) Product "A" takes five hours to produce on a particular machine and it has a selling price of Rs.50 and a marginal cost of Rs.35. **(6 Marks)**
- On the same machine, another product "B" can be made at two hours at a marginal cost of Rs.5 per unit. Supplier's price of product "B" is Rs.10 per unit.

Assuming that machine hour is the key factor, advise whether product "B" could be bought out or manufactured.

- (c) R Ltd., will produce 3,00,000 kgs of S and 6,00,000 kgs of Y from an input of 9,00,000 kgs of raw material Z. **(7 Marks)**

The selling price of S is Rs.8 per kg and that of Y is Rs.6 per kg.

Processing costs amount to Rs.54 lacs per month as under:

Raw material Z 9,00,000 kgs at Rs.3 per kg	Rs.27,00,000
Variable process costs	Rs.18,00,000
Fixed processing costs	Rs.9,00,000
Total	<u>Rs.54,00,000</u>

There is an offer to purchase 60,000 kgs of Y additionally at a price of Rs.4 per kg. The existing market for Y will not be affected by accepting the offer. But the price of S is likely to be decreased uniformly on all sales.

Find the minimum reduced average price for S to sustain the increased sales.

PAPER 5: COST MANAGEMENT
MAY 1999

Question No.1 is compulsory

Answer any four questions from the rest.

Working notes should form part of the answer.

Question 1

- (a) What is margin of safety? How can margin of safety be improved? **(4 Marks)**
- (b) What are the pre-requisites for a Responsibility Accounting System? **(4 Marks)**
- (c) Briefly explain the concept of value analysis as a cost reduction technique. **(4 Marks)**
- (d) Anuradha Enterprises manufactures and sells black phenyl worth Rs.20,000, while phenyl worth Rs.25,000, scented phenyls worth Rs.10,000 and naphthalene balls worth Rs.5,000 every month. The family's total fixed costs per month are Rs.14,700. The variable costs are : on black phenyl 60% on white phenyl 68%, on scented phenyl 80% and on naphthalene balls 40%.
The proprietrix, Ms.Anuradha Shah, being basically a science graduate, wonders at what combined sales volume does she really start earning profit. Please help her in arriving at such a sales volume.

Question 2

- (a) Briefly explain the terms "product cost" and "period cost". **(4 Marks)**
- (b) Distinguish between "marginal cost" and "differential cost". **(5 Marks)**
- (c) A Firm needs a component in an assembly operation. If it wants to do the manufacturing itself, it would need to buy a machine for Rs.4 lakhs which will last for 4 years with no salvage value. Manufacturing costs in each of the 4 years would be Rs.6 lakhs, Rs.7 lakhs, Rs.8 lakhs and Rs.10 lakhs respectively. If the firm had to buy the components from a supplier, the cost would be Rs.9 lakhs, Rs.10 lakhs, Rs.11 lakhs and Rs.14 lakhs respectively in each of the four years. However, the machine would occupy floor space which would have been used for another machine. This latter machine would be hired at no cost to manufacture an item, the sale of which would produce net cash flows in each of the four years of Rs.2 lakhs. It is impossible to find room for both the machines and there are no other external effects. The cost of capital is 10% and the present value factor for each of the four years is 0.909, 0.826, 0.751 and 0.683 respectively. **(10 Marks)**
Should the firm make the components or buy from outside?

Question 3

- (a) "Calculation of variance in standard costing is not an end in itself, but a means to an end". Discuss. **(7 Marks)**
- (b) Mahila Griha Udyog Industries is considering to supply its products – a special range of namkeens - to a departmental store. The contract will last for 50 weeks, and the details are given below: **(12 Marks)**

Material :	Rs.
X (in stock – at original cost)	1,50,000
Y (on order – on contract)	1,80,000
Z (to be ordered)	3,00,000
Labour :	
Skilled	5,40,000
Non – skilled	3,00,000
Supervisory	1,00,000
General overheads	10,80,000
Total cost	26,50,000
Price offered by department store	18,00,000
Net loss	8,50,000

Should the contract be accepted if the following additional information is considered ?

- (i) Material X is an obsolete material. It can only be used on another product, the material for which is available at Rs.1,35,000 (Material X requires some adaptation to be used and costs Rs.27,000)

- (ii) Material Y is ordered for some other product which is no longer required. It now has a residual value of Rs.2,10,000.
- (iii) Skilled labour can work on other contracts which are presently operated by semi-skilled labour at a cost of Rs.5,70,000.
- (iv) Non – skilled labour are specifically employed for this contract.
- (v) Supervisory staff will remain whether or not the contract is accepted. Only two of them can replace other positions where the salary is Rs.35,000.
- (vi) Overheads are charged at 200% of skilled labour. Only Rs.1,25,000 would be avoidable, if the contract is not accepted.

Question 4

- (a) What are the limitations of a break-even chart? **(5 Marks)**
- (b) Despite the increase in the Sales price of its sole product to the extent of 20%, a company finds that it has incurred a loss during the year 1998-99 to the extent of Rs.4 lakhs as against a profit of Rs.5 lakhs made in 1997-98. This adverse situation is attributed mainly to the increase in prices of materials and overheads, the increase over the previous year being, on the average, 15% and 10% respectively. **(14 Marks)**

The following figures are extracted from the books of the company:

	31.3.98	31.3.99
	Rs.	Rs.
Sales	1,20,0,000	1,29,60,000
Cost of sales		
Material	80,00,000	91,10,000
Variable overhead	20,00,000	24,00,000
Fixed overhead	15,00,000	18,50,000

Required : Analyze the variances curve the year in order to bring out the reasons for the fall in profit.

Question 5

The Financial controller of ACE Ltd., has prepared the following estimates of working results for the year ending 31st March, 1999: **(19 Marks)**

		Year ending 31-3-1999
Direct material	Rs./unit	16.00
Direct wages	Rs./unit	40.00
Variable overheads	Rs./unit	12.00
Selling price	Rs./unit	125.00
Fixed expenses	Rs.	6,75,000 p.a.
Sales	Rs.	25,00,000 p.a.

During the year 1999-2000, it is expected that the material prices and variable overheads will go up by 10% and 5% respectively. As a result of re-engineering of business processes, the overall direct labour efficiency will increase by 12%, but the wage rate will go up by 5%. The fixed overheads are also expected to increase by Rs.1,25,000.

The Vice-President - manufacturing states that the same level of output as obtained in 1998-1999 should be maintained in 1999-2000 also and efforts should be made to maintain the same level of profit by suitably increasing the selling price.

The Vice – President – Marketing states that the market will not absorb any increase in the selling price. On other hand, he proposes that publicity involving advertisement expenses as given below will increase the quantity of sales as under:

Advertisement Expenses	(Rs.)	80,000	1,94,000	3,20,000	4,60,000
Additional units of sales		2,000	4,000	6,000	8,000

Required :

- (a) Present an Income Statement for 1999-2000.
- (b) Find the revised price and the percentage of increase in the price for 1999-2000, if the views of the Vice – President - Manufacturing are accepted.

- (c) Evaluate the four alternative proposals put forth by the Vice - President – Marketing. Determine the best output level to be budgeted and prepare an over-all Income Statement for 1999-2000 at that level of output.

Question 6

- (a) Enumerate the circumstance which are favorable for the adoption of a penetrating pricing policy. **(4 Marks)**
- (b) Give any **three** examples of opportunity cost. **(3 Marks)**
- (c) The details of the output presently available from a manufacturing department of Hitech Industries Ltd., are as follows: **(12 Marks)**

Average output per week	48,00 units from 160 employees
Saleable value of output	Rs.6,00,000
Contribution made by the output towards fixed expenses and profit	Rs.2,40,000

The Board of Directors plans to introduce more automation in the department at a capital of Rs.1,60,000. the effect of this will be to reduce the number of employees to 120, but to increase the output per individual employee by 60%. To provide the necessary incentive to achieve the increased output the Board intends to offer a 1% increase in the piece work rate of one rupee per article for every 2% increase in average individual output achieved. To sell the increased output, it will be necessary to decrease the selling price by 4%.

Required :

Calculate the extra weekly contribution resulting from the proposed change and evaluate, for the Board's information, the worth of the project.

PAPER 5 : COST ACCOUNTING & COST SYSTEM
NOVEMBER 1998

Question No.1 is compulsory

Answer any four questions from the rest.

Working notes should form part of the answer.

Question 1

- (a) Explain the concept of cost drives. (4 Marks)
 Indicate what you will consider as cost drives for the following business functions:
 (i) research and development; and
 (ii) customer service.
- (b) Briefly identify the areas of cost reduction at the product design stage. (4 Marks)
- (c) List out the assumptions of break – even analysis. (4 Marks)
- (d) A Company presently brings coal to its factory from a nearby yard and the rate paid for transportation of coal from the yard located 6 km away to factory is Rs.50 per tonne. The total coal to be handled in a month is 24,000 tonne. (12 Marks)

The company is considering proposal to buy its own truck and has the option of buying either a 10 tonne capacity or a 8 tonne capacity truck.

The following informations are available:

	10 tonne Truck	8 tonne Truck
Purchase price	Rs.10,00,000	8,50,000
Life (year)	5	5
Scrap value at the end of 5 th year	Nil	Nil
Km per litre of diesel	3	4
Repair / Maint. P.a. per Truck	60,000	48,000
Other fixed expenses p.a.	60,000	36,000
Lubricants & Sundries per 100 km	Rs.20	Rs.20

Each truck will daily make 5 trips (to and fro) on an average for 24 days in a month.

Cost of Diesel Rs.15 per litre.

Salary of Drivers Rs.3,000 per month – Two Drivers will be required for a Truck

Other staff expenses Rs.1,08,000 p.a.

Present a comparative cost sheet on the basis of above data showing transport cost per tonne of operating 10^t and 8^t Truck at full capacity utilization.

Question 2

- (a) What are the limitations of marginal costing ? Explain (5 Marks)
- (b) A Company can produce and sell at its maximum capacity 20,000 units of a product. The sale price is Rs.100. The present sales is 15,000 units. To produce over 20,000 units and upto another 10,000 units some balancing equipments are to be installed at a cost of Rs.10 lakhs and the same will have a life span of 10 years. (14 Marks)

The current cost structure is as under:

Direct material	30% of sale value
Direct labour	20% of sale value
Variable overheads	Rs. 20 per unit
Profit	Rs.15 per unit.

The present cost is estimated to go up due to price escalation as under:

10% in Direct Material from present level of 30%

25% in Direct Labour from present level of 20%

Rs.50,000 in Fixed overheads per year.

There is a concrete proposal from a party to take 10,000 units additionally over the present level of output on a long term basis at a unit of Rs.90. apart from the investment of Rs.10 lakhs, as shown above, the fixed overheads will increase by Rs.50,000 due to additional Administrative expenses.

The Company is in a dilemma as to whether to accept the order for 10,000 units or to use the present unused capacity of 5,000 units for which there will be additional selling expenditure of Rs.50,000. Ignore financing charges and give your recommendation.

Question 3

- (a) What are incremental costs and sunk costs? Discuss. **(3 Marks)**
 (b) Briefly explain the implications of replacement costs and historical costs in financial reporting. **(3 Marks)**

- (c) A Company is organized on decentralized lines, with each manufacturing division operating as a separate profit centre. Each division manager has full authority to decide on sale of the division's output to outsiders and to other divisions.

Division C has always purchased its requirement of a component from Division A. but when informed that Division A was increasing its selling price to Rs.150, the manager of Division C decided to look at outside suppliers.

Division C can buy the component from an outside supplier for Rs.135. But Division A refuses to lower its price in view of its need to maintain its return on the investment.

The top management has the following information:

C's annual purchase of the component	1,000 units
A's variable costs per unit	Rs.120
A's fixed cost per unit	Rs.20

Required : **(13 Marks)**

- (i) Will the company as a whole benefit, if Division C bought the component at Rs.135 from an outside supplier?
 (ii) If A did not produce the material for C, it could use the facilities for other activities resulting in a cash operating savings of Rs.18,000. Should C then purchase from outside sources?
 (iii) Suppose there is no alternative use of A's facilities and the market price per unit for the component drops by Rs.20. Should C now buy from outside?

Question 4

- (a) What are relevant costs? Identify two common pitfalls in relevant cost analysis. **(4 Marks)**
 (b) Inorganic Chemicals purchases salt and processes it into more refined products such as caustic soda, chlorine and polyvinyl chloride (PVC). For the month of October, 1998, the firm purchased salt for Rs.80,000 conversion costs incurred were Rs.1,20,000 upto the split off point, at which time two salable products were produced; Caustic soda and chlorine. Chlorine could be further processed into PVC. Production and other relevant information for the month of October, 1998 are as follows: **(15 Marks)**

	Production	Sales	Sales price per ton
Caustic soda	2,400 tons	2,400 tons	Rs.100
Chlorine	1,600 tons	--	--
PVC	1,000 tons	1,000 tons	Rs.400

The full production of chlorine was further processed at an incremental cost of Rs.40,000 to yield 1,000 tons of PVC. There were no by-products or scrap from this further processing of chlorine. The organization did not have any opening or closing stocks of any of the above commodities for October, 1998.

There is a very active market for chlorine. The firm could have sold its entire production for October, 1998 at Rs.150 per ton.

You are required to calculate:

- (i) How the joint costs of Rs.2,00,000 would be allocated between caustic soda and chlorine under each of the methods, viz., (a) sales value at split off; (b) Physical measure (tons); and (c) Estimated net realizable value?

- (ii) The gross margin percentage of (a) caustic soda and (b) PVC under the three methods given in (i) above.
- (iii) Daily Swimming Pool Ltd., offers to purchase 1,600 tons of chlorine in November, 1998 at Rs.150 per ton. This would mean that no PVC would be produced that month. Will the acceptance of the offer affect the operating income for November, 1998?

Question 5

CARCARE CORPORATION has just today paid for and installed a special machine for polishing cars at one of its prestigious outlets. It is the first day of the company's fiscal year. The machine costs Rs.20,000. Its annual operating costs total Rs.15,000, exclusive of depreciation. The machine will have a four year useful life and a zero terminal disposal value. **(19 Marks)**

After the machine has been used for one day, a machine salesman walks in. He offers a different machine that promises to do the same job at a yearly operating cost of Rs.9,000, exclusive of depreciation. The new machine will cost Rs.24,000 in cash, duly installed. The "old" machine is unique and can be sold outright for only Rs.10,000 minus Rs.2,000 removal cost. The new machine, like the old one, will have a four year useful life and zero terminal disposal value.

Sales, all in cash, will be Rs.1,50,000 annually and other cash costs will be Rs.1,10,000 annually, regardless of this decision.

For simplicity, ignore income taxes, interest and present value considerations.

Required :

- Prepare a statement of cash receipts and disbursements for each of the four years under both alternatives. What is the cumulative difference in cash flows for the four years taken together?
- Prepare income statement for each of the four years under both alternatives. Assume straight line depreciation. What is the cumulative difference in operating income for the four years taken together?
- What are the irrelevant items in your representations in requirements (a) and (b) ? Why are they irrelevant ?
- Suppose the cost of the "old" machine was Rs.10,00,000 rather than Rs.20,000. nevertheless, the old machine can be sold outright for only Rs.10,000 minus Rs.2,000 removal costs. Would the net differences in requirements (a) and (b) change ? Explain.
- "To avoid a loss, we should keep the old machine." What is the role of book value in decisions about replacement of machines?

Question 5

- Identify the role of cost accountant in the area of material cost control. **(4 Marks)**
- How are the cost variances disposed off in a standard costing system? Explain **(3 Marks)**
- The Operations Manager of FLEXI SHOP ENTERPRISES is considering the possibility of leasing equipment for a new flexible manufacturing system(FMS) to replace existing equipment. The FMS lease will increase annual fixed costs by Rs.9,00,000 per year and reduce variable costs by Rs.800 per job. **(12 Marks)**

The manager believes that the annual number of jobs processed by the firm will be 900 , 1,200 or 1,500. The probabilities of these events occurring are:

Annual number of jobs	Probability
900	0.25
1,200	0.45
1,500	0.30
	1.00

Required:

Should the company lease the FMS? Support your conclusions with appropriate calculations.

PAPER 5: ADVANCED COST ACCOUNTING AND COST SYSTEMS
MAY 1998

Question No.1 is compulsory. Answer any four from the rest.

Question 1

- (a) List out any four operation research techniques which can be used for cost control in an organization **(4 Marks)**
- (b) What is contribution? How is it related to profit? **(2 Marks)**
- (c) Discuss briefly the concept of Skimming Pricing Policy? **(6 Marks)**
- (d) A company produces and sells four types of dolls for children. It also produces and sells a set of dress kit for the dolls.

The company has worked out the following estimates for the next year:

Doll	Estimated demand	Standard Material Cost Rs.	Standard Labour Cost Rs.	Estimated Sales Per Unit Rs.
A	50,000	20	15	60
B	40,000	25	15	80
C	35,000	50	20	120
D	30,000	50	20	120
Dress Kit	2,00,000	15	5	50

To encourage the sale of dress kit, a discount of 20% in its price is offered if it were to be purchased along with the doll. It is expected that all the customers buying dolls will also buy the dress kit.

The company's factory has effective capacity of 2,00,000 labour hours per annum on a single-shift basis and it produces all the products on that basis. The labour hour rate is Rs.15. overtime of labour has to be paid at double the normal rate.

Variable cost works out to 40% of direct labour cost. Fixed cost are Rs.30 lakhs per annum

There will be no inventory at the end of the year.

You are to draw a conservative estimate of the year's profitability

(12 Marks)

Question 2

- (a) Enumerate and briefly explain any three methods of determining transfer prices. **(6 Marks)**
- (b) On 1st April, 1998, ZED Company began the manufacture of a new electronic gadget. The company installed a standard costing system to account for manufacturing costs. The standard cost for a unit of the product are as under:

	Rs.
Direct Material (3 kgs at Rs.5 per kg.)	15.00
Direct Labour (0.5 hour at Rs.20 per hour)	10.00
Manufacturing Overhead (75% of direct labour cost)	7.50
Total cost	32.50

The following data was obtained from ZED Company's records for April, 1998:

	Debit Rs.	Credit Rs.
Sales	--	1,25,000
Sundry creditors (For purchase of direct materials in April, 1998)	68,250	--
Direct Material Price Variance	3,250	--
Direct Labour Rate Variance	2,500	--
Direct Labour Efficiency Variance	--	2,000

The Actual Production in April 1998 was 4,000 units of the gadget, and the actual sales for the month was 2,500 units.

The amount shown above for direct materials price variance applies to materials purchased during April, 1998. There was no opening stock of raw materials on 1st April 1998.

Required:

Calculate for April, 1998 the following:

- (i) Standard direct labour hours allowed for the actual output achieved.
- (ii) Actual direct labour hours worked.
- (iii) Actual direct labour rate.
- (iv) Standard quantity of direct materials allowed (in kgs.)
- (v) Actual quantity of direct materials used (in kgs)
- (vi) Actual quantity of direct materials purchased (in kgs.)
- (vii) Actual direct materials price per kg.

(13 Marks)

Question 3

- (a) Gemini Enterprises currently makes as many units of part no.X-248 as it needs. Sen, General Manager of Gemini Enterprises, has received a quotation from another company for making part no.X-248 Zedco will supply 1,000 units of part no.X-248 per year at Rs.50 per unit. Zedco can begin supply on 1st July, 1998 and continue for 5 years, after which Gemini will not need the part. Zedco can accommodate any changes in Gemini's demand for the part and will supply it for Rs.50 regardless of quantity. Shah, the Controller of Gemini Enterprises, reports the following costs for manufacturing 1,000 unit of part no.X-248.

	Rs.
Direct materials	22,000
Direct labour	11,000
Variable manufacturing overhead	7,000
Depreciation on machine	10,000
Product and process engineering	4,000
Rent	2,000
Allocation of General plant overhead costs	5,000
Total costs	61,000

The following additional information is available:

- (a) Part X-248 is made on a machine used exclusively for its manufacture. The machine was acquired on 1st July, 1997 at a cost of Rs.60,000. The machine has a useful life of six years and a zero terminal disposal price. Depreciation is calculated on straight – line basis.
- (b) The machine could be sold today for Rs.15,000
- (c) Product and process engineering costs are incurred to ensure that the manufacturing process for part no. X-248 works smoothly. Although these costs are fixed in the short run, with respect to units of part no.X-248 is outsourced, product and process engineering cost of Rs.4,000 will be incurred for 1997-98 but not thereafter.
- (d) Rent costs of Rs.2,000 are allocated to products on the basis of the floor space used for manufacturing the product. If part number X-248 is discontinued, the space currently used to manufacture it would become available. The company could then use the space for storage purposes and saves Rs.1,000 currently paid for outside storage.
- (e) General plant overhead costs are allocated to each department on the basis of direct manufacturing labour costs. The costs will not change in total. But no general plant overhead will be allocated to part number X-248 if the part is outsourced.

Assume that Gemini requires a 12% rate of return for this project. The following information maybe useful:

Year	Present Value Factor at 12%
0	1.000
1	0.893
2	0.797
3	0.712

4	0.636
5	0.567

Required:

- (i) Should part number X-248 be outsourced? Prepare a quantitative analysis.
 - (ii) State any sensitivity analysis that seems to be advisable. Do not perform any sensitivity calculations
 - (iii) Sen is particularly concerned about his bonus for 1997-98. The bonus is based on the accounting income of Gemini Enterprises. What decision will Sen make if he wants to maximize his bonus for 1997-98? **(16Marks)**
- (b) Briefly explain the concept of Simo Charts. **(3 Marks)**

Question 4

- (a) Distinguish between absorption costing and marginal costing. **(4 Marks)**
- (b) ACE Office Supplies Corporation retails two products – a standard and a deluxe version of a designer ball point pen. The budgeted income statement is as under:

	Standard	Deluxe	Total
Sales (in units)	1,50,000	50,000	2,00,000
	Rs.	Rs.	Rs.
Sales :			
@ Rs.20 per unit	30,00,000	--	
@ Rs.30 per unit	--	15,00,000	45,00,000
Variable costs:			
@ Rs.14 per unit	21,00,000	--	
@ Rs.18 per unit	--	9,00,000	30,00,000
Contribution	9,00,000	6,00,000	15,00,000
Fixed costs			12,00,000
Profit			3,00,000

Required :

- (i) Calculate the break even point in units assuming that the planned sales mix is maintained.
- (ii) Calculate the breakeven point in units:
 - i. If only standard version is sold, and
 - ii. If only deluxe version is sold.
- (iii) Suppose 2,00,000 units are sold, but only 20,000 units are of deluxe quality. Calculate the profit. Calculate the breakeven points if these relationships persists in the next accounting period. Compare your answer with the original plan and the answer in requirement (b). What is your major finding? **(15 Marks)**

Question 5

Modern Airways owns a single jet aircraft and operates between EXETOWN and WYETOWN. Flights leave EXETOWN on Mondays and Thursdays and depart from WYETOWN on Wednesdays and Saturdays. Modern Airways cannot afford any more flights between EXETOWN and WYETOWN. Only tourist class seats are available on its flights. An analyst has collected the following information:

Seating capacity per plane	360
Average passengers per flight	200
Flights per week	4
Flights per years	208
Average one-way fare	Rs.5,000
Variable fuel costs	Rs.1,40,000 per flight
Food service to passengers (not charged to passengers)	Rs.200 per passenger
Commission paid to travel agents paid by Modern Airways on each ticket booked on Modern Airways.	8% fare

(Assume that all Modern Airways tickets are booked by travel agents)

Fixed annual lease cost allocated to each flight	Rs.5,30,000 per flight
Fixed ground service (maintenance, check-in, baggage handling cost allocated to each flight)	Rs.70,000 per flight
Fixed salaries of flight crew allocated to each flight	Rs.40,000 per flight.

For the sake of simplicity, assume that fuel costs are unaffected by the actual number of passengers on a flight. Required:

- What is the operating income that Modern Airways makes on each one-way flights between EXETOWN and WYETOWN?
- The market research department of Modern Airways indicates that lowering the average one-way fare to Rs.4,800 will increase the average number of passenger per flight to 212. Should Modern Airways lower its fare?
- Zed Tours and Travels, a tour operator, approaches Modern Airways to charter its jet aircraft twice each month, first to take Zed's international tourists from EXETOWN to WYETOWN and then bring the tourists back from WYETOWN to EXETOWN. If Modern Airways accepts the offer, it will be able to offer only 184 (208 minus 24) of its own flights each year. The terms of the charter are:
 - For each one-way flight Zed will pay Modern Rs.7,50,000 to charter the plane and to use its flight crew and ground service staff.
 - Zed will pay for fuel costs.
 - Zed will pay for all food costs.

On purely financial considerations, should Modern Airways accept the offer from Zed Tours and Travels? What other consideration should Modern Airways consider in deciding whether or not to charter its plane to Zed Tours and Travels?

Question 6

- Explain, briefly, the terms Expense Centre, Profit Centre and Investment Centre. (6 Marks)
- What is job evaluation? How is it related to merit rating? Discuss. (5 Marks)
- ACE Ltd., has an inventory of 5,000 units of a product left over from last year's production. This model is no longer in demand. It is possible to sell these at reduced prices through the normal distribution channels. The other alternative is to ask someone to take them on "as is where is" basis. The latter alternative will cost the company Rs.5,000.

The company produced 2,40,000 units of the product last year, when the units costs were as under:

	Rs.	Rs.
Manufacturing Cost:		
Variable	6.00	
Fixed	1.00	7.00
Selling & Distribution Cost:		
Variable	3.00	
Fixed	1.50	4.50
Total cost		11.50
Selling price per unit		14.00

Required :

Should the company scrap the items or sell them at a reduced price? If you suggest the latter, what minimum price would you recommend? (8 Marks)

PAPER 5: ADVANCED COST ACCOUNTING AND COST SYSTEMS
NOVEMBER 1997

Question No.1 is compulsory. Answer any four from the rest.

Question 1

- (a) What is meant by Cost-plus pricing? **(4 Marks)**
 (b) What is Responsibility Accounting? **(4 Marks)**
 (c) What is the distinction between Cost Control and Cost Reduction? **(4 Marks)**
 (d) A Company produces three products from an imported material. The Cost Structure per unit of the products are as under:

	Product		
	A	B	C
	Rs.	Rs.	Rs.
Sales value	200	300	250
Direct Material	50	80	60
Direct wages Rs.6 per hour	60	120	108
Variable Overheads	30	60	54

Out of Direct Material 80% is of the Imported Material @ Rs.10 per kg.

Prepare a statement showing comparative Profitability of the three products under the following scenarios:

- (i) Imported Material is in restricted supply.
 (ii) Production Capacity is limiting factor.
 (iii) When maximum sales potential A and B are 1,000 units each and that of product "C" is 500 units for specific requirement, availability of imported material is restricted to 10,000 kgs per month, how the profit could be maximized? **(12 Marks)**

Question 2

- (a) What is meant by Incremental Revenue? **(4 Marks)**
 (b) A Company has two Divisions, Division "A" and Division "B". Division "A" has a Budget of selling 2,00,000 nos. of a particular component 'x' to fetch a return of 20 % on the average assets employed. The following particulars of Division "A" are also known:

Fixed overhead	Rs.5 lakhs
Variable cost	Rs.1 per unit
Average Assets	
Sundry Debtors	Rs.2 lakhs
Inventories	Rs.5 lakhs
Plant & Equipments	Rs.5 lakhs

However, there is constraint in Marketing and only 1,50,000 units of the component 'x' can be directly sold to the Market at the proposed price.

It has been gathered that the balance 50,000 units of component 'x' can be taken up by Division "B". Division "A" wants a price of Rs.4 per unit of 'x' but Division "B" is prepared to pay Rs.2 per unit of 'x'.

Division "A" has another option in hand, which is to produce only 1,50,000 units of component 'x'. This will reduce the holding of assets by Rs.2 lakhs and fixed overhead by Rs.25,000.

You are required to advise the most profitable course of action for Division "A". **(15 Marks)**

Question 3

X Ltd., has two factories, one at Lucknow and another at Pune producing 7,200 tonnes and 10,800 tonnes of a product against the maximum production capacity of 9,000 and 11,880 tonnes respectively at Lucknow and Pune.

10% of the raw material introduced is lost in the production process. The maximum quantity of raw material, available locally are 6,000 and 13,000 tonnes at Rs.720 and Rs.729 per tonne at Lucknow and Pune

respectively. For the additional needs a supplier of Bhopal is ready to supply raw material at our factory site at Rs.792 per tonne.

Other variable costs of the production process are Rs.22.32 lacs and Rs.32.94 lacs and fixed cost are Rs.18 lacs and Rs.24.84 lacs respectively for Lucknow and Pune factory.

The output is sold at a selling price of Rs.1,450 and Rs.1,460 per tonne by Lucknow and Pune factory respectively.

You are required to compute the cost per tonne and net profit earned in respect of each factory.

Can you suggest any other alternative production plan for both the factories without any change in present total output of 18,000 tones whereby the company may earn optimum profit. **(19 Marks)**

Question 4

(a) What are the basic differences between Standard Costing and Budgetary Control? **(7 Marks)**

(b) The Standard Cost Card of producing one unit of item "Q" is as under:

Direct material --	A – 12 Kg. @ Rs.10/-	=	Rs.120
	B – 5 Kg. @ Rs.6/-	=	Rs.30
Direct wages --	5 Hrs. @ Rs.3/-	=	Rs.15
Fixed Production Overheads		=	<u>Rs.35</u>
Total Standard Cost		=	Rs.200
Standard Gross Profit		=	<u>Rs.50</u>
Standard Sale Price		=	<u>Rs.250</u>

Fixed Production Overhead is absorbed on expected annual output of 13,200 units.

Actual result for the month of September, 1997 are as under:

Actual production	1,000 units		Rs.
Sales	1,000 units @ Rs.250	=	2,50,000
Direct Material --	A – 11,000 Kg.	=	1,21,000
	B- 5,200 kg.	=	28,600
Direct Wages	-- 5,500 Hrs.	=	17,500
Fixed Overheads		=	<u>39,000</u>
		=	<u>2,06,100</u>
	Gross Profit	=	<u>43,900</u>

You are required to calculate all variances. Material price variance is taken out at the time of receipt of Material, Material purchased were:

12,000 kg. of "A" @ Rs.11 & 5,000 Kg. of "B" @ Rs.5.50

(12 Marks)

Question 5

(a) "Cost may be classified in a variety of ways according to their nature and information needs of the management". Discuss. **(4 Marks)**

(b) Elegant Hotel has a capacity of 100 single rooms and 20 double rooms. It has a sports centre with a swimming pool, which is also used by persons other than residents of the hotel. The hotel has a shopping arcade at the basement and a specialty restaurant at the roof top. The following information is available.

i. Average occupancy : 75% for 365 days of the year.

ii. Current costs are :

	Variable cost Rs.per day	Fixed cost Rs. Per day
Single Room	400	200
Double Room	500	250

iii. Average sales per day of restaurant Rs.1,00,000; contribution is at 30%. Fixed cost Rs.10,00,000.

iv. The sports centre/s swimming pool is likely to be used by 50 non-residents daily; average contribution per day per non-resident is estimated at Rs.50; fixed cost is Rs.5,00,000 per annum.

- v. Average contribution per month from the shopping arcade is Rs.50,000; fixed cost is Rs.6,00,000 per annum.

You are required to find out:

- (a) Rent chargeable for single and double room per day, so that there is a margin of safety of 20% on hire of rooms and that the rent for a double room should be kept at 10% of a single room.
(b) Evaluate the profitability of restaurant, sports centre and shopping arcade separately. **(15 Marks)**

Question 6

- (a) What is meant by Opportunity Cost? **(4 Marks)**
(b) You are required to calculate a suggested fare per passenger / km from the following information for a Mini Bus:
- a. Length of route: 30 Km
 - b. Purchase price Rs.4,00,000
 - c. Part of above cost met by loan, annual interest of which is Rs.10,000 p.a.
 - d. Other annual charges; Insurance Rs.15,000. Garage rent Rs.9,000, Road Tax Rs.3,000, Repairs & Maintenance Rs.15,000, Administrative Charges Rs.5,000.
 - e. Running expenses: Driver & Conductor Rs.5,000/pm., Repairs / Replacement of tyre tube Rs.3,600 p.a. Diesel and oil cost per km Rs.5.
 - f. Effective life of vehicle is estimated at 5 years at the end of which it will have a scrap value of Rs.10,000
 - g. Mini bus has 20 seats and is planned to make Six No. two-way trips for 25 days / p.m.
 - h. Provide profit @ 20% of total revenue.

PAPER 5: COST A/C & COST CONTROL
MAY 1997

Question No.1 is compulsory

Answer any four questions from the rest.

Working notes should form part of the answer.

Question 1

- (a) The advent of operations research has afforded considerable scope for cost reduction." Explain (3 Marks)
(b) Describe the role of cost accountant in the area of operating efficiency. (4 Marks)
(c) "Optimum level of inventory is that which minimizes the total costs." Discuss. (4 Marks)
(d) The relevant data of X Ltd. for its three products A, Band C are as under: (12 Marks)

	A	B	C
Direct Material (Rs./Unit)	260	300	250
Direct Labour (Rs./Unit)	130	270	260
Variable Overheads (Rs./Unit)	110	230	180
Selling Price (Rs./Unit)	860	1,040	930
Machine Hours Required (Per Unit)	12	6	3

The estimated fixed overheads at four different levels of 3,600; 6,000; 8,400; and 10,800 machine hours are Rs. 1,00,000; Rs. 1,50,000; Rs. 2,20,000 and Rs. 3,00,000 respectively. The maximum demand of A , Band C in a cost period are 500; 300 and 1,800 units respectively.

You are required to find out (i) the most profitable product-mix at each level and (ii) the level of activity where the profit would be maximum.

Question 2

(19 Marks)

Navbharat Commerce College, Bombay has six sections of B.Com. and two sections of M.Com. with 40 and 30 students per section respectively., The college plans one day pleasure trip around the city for. the students once in an academic session during winter break' to ,visit park, zoo, planetarium and aquarium.

A Transporter used to provide the required number of buses at a flat rate of Rs. 700 per bus for the aforesaid purpose. In addition, a special permit fee of Rs. 50 per bus is required to be deposited with city municipal corporation. Each bus is 52 seater. Two seats are reserved for teachers who accompany in each bus. Each teacher is paid daily allowance of Rs.100/- for the day. No other costs in respect of teachers are relevant to the trip.

The approved caterers of the college supply breakfast, lunch and afternoon tea respectively at Rs. 7, Rs. 30 and Rs. 3 per student.

No entrance fee is charged at the park Entrance fees come to Rs. 5 per student both for the zoo and the aquarium. As regards planetarium the authorities charge/block entrance fee as under for group of students of educational institlJtions depending upon the number of students in a group:

Number of Students in a Group	Block Entrance Fee. Rs.
Upto 100	200
101- 200	300
201 & above	450

Cost of prizes to be awarded to the winners in different games being arranged in the park depend upon the strength of students in a trip. Cost of prizes to be distributed are :

Number of Students in a Trip	Cost of prizes Rs.
Upto 50	900
51-125	1,050
126-150	1,200
151-200	1,300
201- 250	1,400
251 & above	1,500

To meet the above costs the college collects Rs. 65 from each student who wish to join trip. The college releases subsidy of Rs. 10 per student in the trip towards it.

You are required to :

- Prepare a tabulated statement showing total costs at the levels of 60, 120, 180, 240 and 300 students indicating each item of cost.
- Compute average cost per student at each of the above levels.
- Calculate the number of students to break-even for the trip as the college suffered loss during the previous year despite 72% of the students having joined the trip.

Question 3

(19 Marks)

The following information is available. in respect of Y Ltd. for a week:

- 400 kg of raw material were actually used in producing product 'EXE'. The purchase cost thereof being Rs. 24,800. The standard price per kg of raw material is Rs. 60. The expected output is 12 units of product 'EXE' from each kg of raw material. Raw material price variance and usage variance as computed by cost accountant are Rs. 800 (adverse) and Rs. 600 (adverse) respectively.
- The week is of 40 hours. The standard time to produce one unit of 'EXE' is 30 minutes. The standard wage rate is Rs. 5 per labour hour. The company employs 60 workers who have been paid hourly wage rate as under:

Number of Workers	:	6	8	46
Hourly Wage Rate (Rs.)	:	4.80	5.20	5.00
- Budgeted overheads for a four-weekly period is Rs. 81,600. The actual fixed overheads spent during the said week are Rs. 19,800.
- Entire output of 'EXE' has been sold at its standard selling price of Rs. 15 per unit.

You are required to :

- Compute the variances relating to labour and overheads.
- Prepare a statement showing total standard costs, standard profit, and actual profit for the week.

Question 4

Universe Ltd. manufactures two products X and y, It is facing severe competition in the market. The monthly sales potential in units at different selling prices as anticipated by the Sales Manager are as under: (19 Marks)

Product –X		Product – Y	
Selling Price Per Unit Rs.	Sales Potential (in units)	Selling Price Per Unit Rs.	Sales Potential (in units)
110	5,000	78	30,000
108	7,500	77	32,000
107	8,000	75	35,000
103	8,400	72	40,000
96	9,000	69	45,000

The total costs as disclosed by the budgets of the company are as follows :

	Product –X		Product – Y	
Output and sales per month (units)	5,000	9,000	30,000	45,000
Total costs per month (Rs. in lacs)	5	6.6	18	25.5
Labour hours needed per month	20,000	36,000	60,000	90,000

You are required to find out the selling price and units to be sold to earn maximum profit where (a) labour hours are available without any restriction and (b) only 95,000 hours are available.

Question 5

- State the principles to be followed in control and accounting of wastage.
- The trading results of ZED Ltd. for 1995-96 and 1996-97 are as follows :

(7 Marks)

(12 Marks)

	1995-96 (Rs.)	1996-97 (Rs.)
Material	1,60,000	2,05,200
Wages	96,000	1,32,000
Variable Overheads	40,000	46,000
Fixed Overheads	50,000	54,800
Total Costs	3,46,000	4,38,000
Profit	54,000	90,000
Sales	4,00,000	5,28,000

Selling price was enhanced by 10% in 1996-97. Material prices and wage rates too have increased by 8% and 10% respectively.

Prepare a statement showing how much each factor has contributed to the variation in profit.

Question 6

- (a) In transfer pricing what is common conflict between a division and the company as a whole. **(6 Marks)**
- (b) What is cost analysis? How it is useful in decision making? **(6 Marks)**
- (c) A machine manufactures 10,000 units of a part at a total cost of Rs. 21 of which Rs. 18 is variable. This part is readily available in the market at Rs. 19 per unit.
If the part is purchased from the market then the machine can either be utilized to manufacture a component in same quantity contributing Rs. 2 per component or it can be hired out at Rs. 21,000.
Recommend which of the alternative is profitable? **(7 Marks)**