

**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 :

- (i) Calculate the ingredients planning variances that are deemed uncontrollable.  
(ii) Calculate the ingredients operating variances that are deemed controllable.  
(iii) Calculate the mixture and yield variances.  
(iv) 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	<u>40</u>
	<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 factory, 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:

- (i) With a selling price of Rs.100, the demand would be 1,500 units p.a.
- (ii) With a selling price of Rs.110, the demand would be 1,000 units p.a.
- (iii) 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.
Lon 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:

- 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.
- What would be the transfer price, if manager of Division B should be kept motivated.
- 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 t he 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

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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.