THE INSTITUTE OF CHARTERED ACCOUNTANTS OF SRI LANKA

SUGGESTED SOLUTIONS

13304–Strategic Management Accounting

CA Professional (Strategic Level I) Examination
December 2014

THE INSTITUTE OF CHARTERED ACCOUNTANTS OF SRI LANKA

Answer No. 01

Business Matter A

(a) Calculating real discount rate

1 + nominal rate = (1+real rate) * (1+ inflation rate)

Therefore

Real DR = ((1+17.6%) / (1+5%)) - 1 = **12.00%**

Company Owned Cars

	Rs. '000	Year	DR @ 12%	PV (Rs.'000)
Purchase price of a car	(5,000)	-	1.000	(5,000)
Sale of used cars (40%*5,000)	2,000	4	0.636	1,272
Maintenance cost (after tax) (250*72%)	(180)	1-4	3.038	(547)
Present value of expenses if company owned cars provided;				**(4,275)**

Provision of Vehicle Allowance

	Rs. '000	Year	DR @ 12%	PV (Rs.'000)
Vehicle allowance (after tax) (80*12*72%)	(691.20)	1-4	3.038	(2,100)
EPF and ETF (after tax) (80*12*15%*72%)	(103.68)	1-4	3.038	(315)
Present value of expenses if vehicle allowance is given;				**(2,415)**
Present value of saving if vehicle allowance is given - Per staff member				**1,860**

Therefore it is recommended to pay vehicle allowance to the management staff instead of present system of providing company owned cars.

Note : Fuel expenses are common to both alternatives. As such, this expense can be totally ignored for both alternatives or can be included for both alternatives.

(b) Decision making is indifferent when both options give the same NPV.

(i) Assuming monthly vehicle allowance as X;

Solving for X;

[(12X*72%) + (12X*72%)*15%] 3.038 = 4,275,000

Monthly Allowance i.e. X approximately = **Rs. 141,624**

(ii) Assuming purchase price of a car as Y;

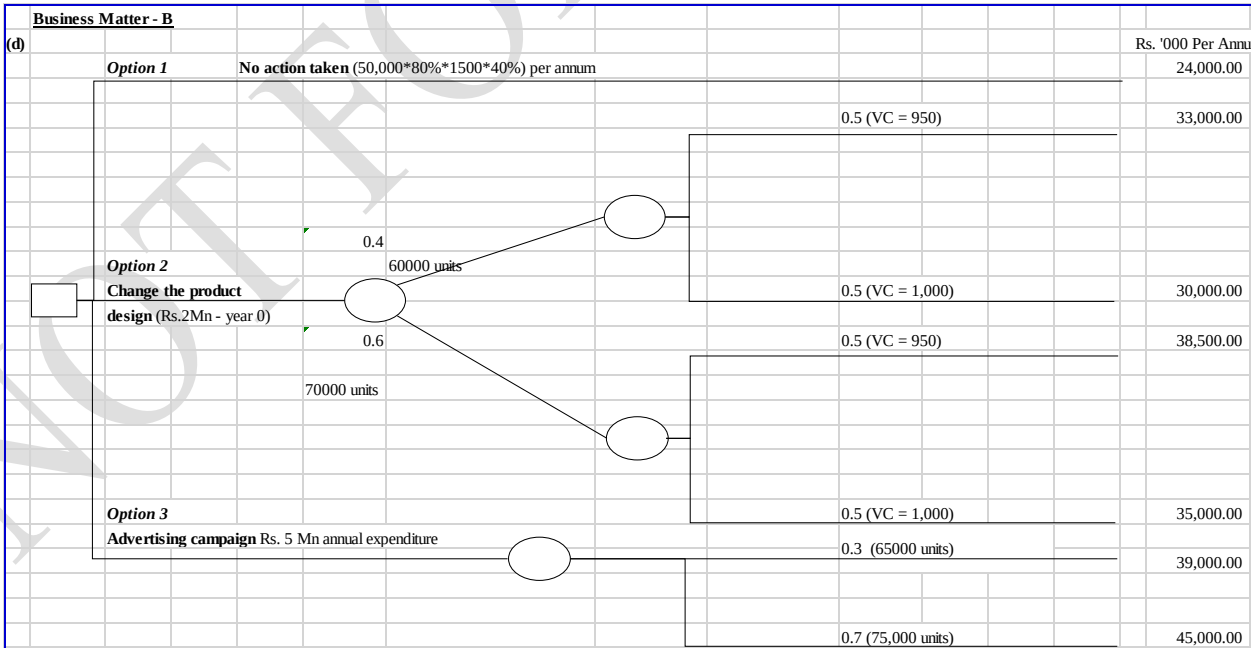
-Y + (0.4Y*0.636) - 547,000 = -2,415,000

Solving for Y;

Purchase price of a car i.e. Y = **Rs. 2,505,364**

(c) Management can increase the monthly allowance for one staff member up to Rs. 141,624 per month without affecting the initial recommendation of paying a monthly allowance, provided other variables such as vehicle price, maintenance etc. remain unchanged. In other words, **management should provide company owned cars to the management staff, if the monthly allowance exceeds Rs. 141,624.**

Management should not change the present system of providing company owned cars, if the car price falls below Rs. 2,505,364 per car provided other variables are remained unchanged.



		Rs. 000		Rs. 000
Option 1:	**No action is taken**			
	PV of contribution (24000*2.283) =			54,792.00
Option 2:	**Changing the product design**			
	PV of contribution			
	50% of 33000*2.283 =	37,669.50		
	50% of 30000*2.283 =	34,245.00		
	Total	71,914.50	*40% =	28,765.80
	50% of 38500*2.283 =	43,947.75		
	50% of 35000*2.283 =	39,952.50		
		83,900.25	*60% =	50,340.15
	Total			**79,105.95**
	Cost of product design			(2,000.00)
	Present value			**77,105.95**
Option 3:	**Conducting advertising campaign**			
	30% of (39,000-5,000)*2.283 =			23,286.60
	70% of (45,000-5,000)*2.283 =			63,924.00
	Present value			**87,210.60**

It is recommended to conduct an advertising campaign.

General comments

The question tests the candidates' ability to appraise the investment options (business matter – A) and solve a decision tree problems (business matter – B). Though the average candidates scored high marks, their performance was variable.

Specific comments

(a) This part was well answered by candidates. However, some candidates were incorrectly discounted real cash flows with the nominal discount rate. Most of them had taken the monthly vehicle allowance in their calculations, instead of the annual figure, resulting in wrong EPF and ETF values as well. Further, some candidates were failed to recognize the tax savings on vehicle allowance, EPF, ETF and maintenance cost.

(b) This part was poorly answered. Very few candidates were recognized that decision making is indifferent when both options give the same NPV. Some were of the view that the decision making is indifferent when NPV equals to zero or when NPV is equal to the NPV of the same option in part (a).

Many candidates failed to recognize the relationship between vehicle allowance, EPF, ETF and tax savings in their answers to b (i) and the purchase price of a car and sale proceeds of the car in their answers to b (ii).

(c) In most of the cases, candidates had not performed suitable calculations in parts b (i) and b (ii), to provide suitable recommendations.

(d) Many candidates had scored marks by drawing the decision tree, although some had scored poorly.

Some candidates failed to calculate the contribution correctly in the option of changing the product design and many candidates failed to apply the discount rate to their answers. A few candidates had incorrectly used the higher value out of the values of two branches, in arriving at the profit from option 2 and option 3.

Answer No. 02

		Fav/(Adv)
(a)	FPO volume capacity variance = (Act Hrs - Btd Hrs) Std rate per hour	
	= (31,000 - 27,000) 20,250,000/27,000 =	**3,000,000**
	FPO volume efficiency variance = (Std Hrs - Act Hrs) Std rate per hour	
	= ((27,000/45,000*50,000) - 31,000) 20,250,000/27,000 =	**(750,000)**
	FPO expenditure variance = (Btd FPOs - Act FPOs)	
	= 20,250,000 - 21,000,000 =	**(750,000)**

(b) Efficiency variance = (Std activity for act output - act activity) Std rate per activity unit

Machinery setups	**Fav/(Adv)**
= ((2,000/45,000)*50,000) - 2,100)*(10,200,000/2000) =	**623,333**
Material handling	
= ((500/45,000)*50,000) - 510)*(6,000,000/500) =	**546,667**
Labour welfare	
= ((27,000/45,000)*50,000) - 31,000)*(4,050,000/27,000) =	**(150,000)**
Expenditure variance = (Std cost of Act activity level - act cost)	
Machinery setups	
= (2,100*10,200,000/2,000) - 10,500,000 =	**210,000**
Material handling	
= (510*6,000,000/500) - 5,600,000 =	**520,000**
Labour welfare	
= (31,000*4,050,000/27,000) - 4,900,000 =	**(250,000)**

(c) Expenditure variance of overhead costs occurs when actual cost of activities of a cost center/cost pool is exceeding or falling behind the amount that is expected at that level of cost driver (activity level).

For example: The actual amount spent for machinery set ups is Rs. 10.5 Mn for 2,100 set ups. But the expected amount for 2,100 set ups is Rs. 10.71 Mn (at the standard cost per set up of Rs. 5,100) resulting a favourable variance of Rs. 210,000.

Efficiency variance occurs when more or less of an activity measure is realized for the actual output level over expected. It is used to measure cost driver activity and compare with the standard quantity allowed at actual output level.

For example: The actual output is 50,000 units. It is required 2,000 set ups for 45,000 units as per standards and as such 2,222 set ups for the actual output of 50,000 units. However, since only 2,100 set ups actually used, there are 122 set up costs saved (at the standard cost per set up of Rs.5100) which generate a favourable Rs. 622,333 variance.

Specific comments

(a) Many candidates well performed this question as expected, however a fair number of candidates got the volume efficiency variance wrong and there were a significant number of candidates who had mixed up these variances e.g. calculating volume efficiency variance for volume capacity variance and vice versa.

(b) Poorly answered by majority of the candidates with many mistakes in calculation of the expenditure variance. They had simply calculated the expenditure variance as budget minus actual and have thus failed to adjust the standard cost for actual activity level. Few candidates could not correctly identify the particular variance/s calculated as favourable or adverse

(c) Answers given were very poor and mostly irrelevant. The question seeks an explanation from candidates of how expenditure and efficiency variances arises and interpreted in an ABC environment. However, many candidates had simply stated the probable reasons for these variances and ways of rectifying the unfavourable.

Answer No. 03

(a)

	Flexed Budget	Actual	Variance	
Output (batches)	50	50		
Direct Labour hours	68.91	93.65	24.74	(Adverse)
Direct Labour cost (Rs.)	8,269.20	11,460	3,190.80	(Adverse)
Direct labour efficiency variance (Rs.) = 24.74 x 120 =			2,968.80	(Adverse)
Direct labour rate variance (Rs.) = 93.65 x 120 - 11,460 =			222.00	(Adverse)
			3,190.80	

Learning curve workings

The average time for 30 batches:
Y = ax^b
Y = 10 x 30^(-0.5146) = 1·737 hours
Total time for 30 batches = 30 x 1·737 hours = 52·11 hours

The average time for 29 batches:
Y = ax^b
Y = 10 x 29^(-0.5146) = 1·768 hours
Total time for 29 batches = 29 x 1·768 hours = 51·27 hours

Therefore the time for the 30th batch = 52·11 hours - 51·27 hours = 0·84 hours
Total time for 50 batches = 52·11 hours + (20 batches x 0·84 hours) = 68.91 hours

(b)

There are a number of reasons why this performance report is more useful than that originally prepared:

- The original comparison was invalid because the actual output differed from that budgeted and no adjustment was made to the expected direct labour hours and direct labour cost.
- The original budget assumptions concerning the learning curve were inappropriate,
- The revised performance report compares the actual performance with that which should have been expected for the actual output achieved.
- The revised performance report analyses the total direct labour cost variance between that caused by efficiency (resource utilisation) and that caused by the difference in wage rates, and thus enables the variances to be attributed to those managers responsible.

	Quarter 01 Rs.	Quarter 02 Rs.	Quarter 03 Rs.
Receipts			
From b/f trade receivables	125,000	-	-
20% cash sales	100,000	90,000	96,000
56% in same quarter	280,000	252,000	268,800
24% in quarter following sale	-	120,000	108,000
Total receipts	505,000	462,000	472,800
Payments			
B/f trade payables	60,000	-	-
Material 50% in same quarter	69,000	75,600	57,800
Material 50% in next quarter	-	69,000	75,600
Labour and overheads	284,000	284,000	284,000
Interest and loan payments	3,000	3,000	103,000
Total payments	416,000	431,600	520,400
Opening balance	49,400	138,400	168,800
Net cash flow	89,000	30,400	(47,600)
Closing balance	138,400	168,800	121,200

Utilisation of cash surplus

- Can be reinvested in stocks which facilitate increased sales.
- Short-term investments such as bank deposits, repos etc.
- Attempts to partly settle long term debts.
- Negotiation for early settlement discounts with suppliers.
- Negotiation for cash discounts for cash purchases.
- Extending credit periods for customers for additional sales

General comments

Tests the candidate's ability to apply learning curve method to a given situation by calculating the flexed budgeted labour cost under revised assumptions and calculation of relevant labour variances and comment on the results with the original information (parts (a) and (b)). Part (c) involves preparation of cash budget and commenting on ways of utilizing the cash surplus

Specific comments

(a) Poorly attempted and many who attempted for this question had incorrectly applied the learning curve formula. Many of them had not taken into consideration that learning is ceased after 30 batches and proceeded to apply the learning curve to 50 batches. Some had calculated the revised budget for 60 batches instead for flexed budget of 50 batches.

(b) Only a very few had attempted this part and the answers submitted by them were not up to standard.

(c) This part was well answered as expected by majority of those who attempted.

Answer No. 04

(a) Contribution for Sun = 4000 x Rs. 1100 = Rs. 4,400,000
Contribution for Moon = 2000 x Rs. 1300 = Rs. 2,600,000
Total Contribution for the company = Rs. 7,000,000

(b)(i) Currently the selling price is Rs. 7,500 for the demand of 2,000 units. For every Rs. 500 increase in selling price, demand reduces by 500 units, so if the price was increased by Rs. 2000 (4 x Rs. 500) to Rs. 9,500 then demand would be zero.

Hence the price equation P = 9500 – x
Total Revenue (multiplying by qty X) : $R = 9500x - x^2$
And therefore Marginal Revenue (MR) = Rs. 9500 – 2x
Marginal cost = Variable cost = Rs. 6,200
So, equating marginal revenue and marginal cost gives:
9500 - 2x = 6200
X (Optimal Quantity) = 1,650
Accordingly Optimal selling price = 9,500 – 1,650 **= Rs. 7,850**

(b)(ii) This would yield a monthly contribution for Moon - Division as follows:

	Rs./Unit
Selling price	7,850
Variable cost	6,200
Contribution	1,650

Total monthly contribution: 1,650 units x Rs. 1,650 = Rs. 2,722,500
Each unit of Mars would use 2 units of component made by Sun
Sun makes a contribution of Rs. 2,500 – Rs. 1,400 = Rs. 1,100 per component
Accordingly the contribution for Sun is: 1,100 x 2 x 1,650 units = Rs. 3,630,000
Total contribution for the company = 2,722,500 + 3,630,000 = Rs. 6,352,500

(c) (i)

From a company's perspective, optimal decision making will occur if the transfer price is at company variable cost + any opportunity cost due to lost external sales.
It is stated that there is sufficient capacity within the company, so no opportunity cost arises.

If the transfer price were to be at the variable cost of Rs. 1400 per component this would change Moon's perspective of its own variable costs (which would now be 4000 per unit) and lead it to a different external price for its own product:

The price equation is unchanged $P = 9500 – x$

And therefore Marginal Revenue $= 9500 – 2x$

Marginal cost = Variable cost = 4000
So, equating marginal revenue and marginal cost: $9500 - 2x = 4000$

And $x = 2,750$

Accordingly selling price = 9500 – 2750 = Rs. 6750 per unit

(c) (ii) This would yield a monthly contribution for Moon as follows:

	Rs./Unit
Selling price	6,750
Component cost	2,800
Other Variable cost	1,200
Contribution	2,750

Total Contribution = 2,750 x Rs. 2750 = Rs. 7,562,500

However, Sun is no longer making any contribution on its internal sales

Total Contribution for the company is also Rs. 7,562,500

(d)
The original company contribution from the sale of Mars was Rs. 7 Mn. When the optimum price for the component was determined in part (b) above the total company contribution decreased to Rs. 6,352,000 but as shown in part (b) above with an internal transfer price based on company variable cost the total company contribution increased to Rs. 7,562,500. Therefore the effect of the transfer price is to distort the decision making processes in such a way would not be beneficial to the company as a whole.

The use of a company variable cost as the transfer price yields a better result for the company as a whole and also for Moon. However the manager of Sun will not be happy with this transfer price because all of the additional contribution has accrued to Moon and it is Sun that has forgone contribution on its internal sales.

Thus while the transfer price should be set at variable cost to enable the optimum decision to be made from a company perspective there needs to be a separate transfer price paid by Moon to Sun (as a fixed cost element) to compensate them for their lost contribution.

Alternate Answer

(b)(i) **Moon Division**

Selling price (Rs.)	7,500	8,000	8,500	9,000
Demand (No. of units)	2,000	1,500	1,000	500
Contribution/unit (Rs.)	1,300	1,800	2,300	2,800
Total contribution (Rs. 000)	2,600	2,700	2,300	1,400

Maximum contribution (Rs.000) =	2,700
Optimal selling price (Rs.)	8,000
Optimal demand (No. of units)	1,500

(b)(ii)

Moon division contribution (Rs. 000) =	2,700
Sun division contribution (Rs. 000) (1500*1100*2) =	3300
Company contribution (Rs.) =	6,000

(c)(i) **Moon Division**

Selling price (Rs.)	6,000	6,500	7,000	7,500	8,000
Demand (No. of units)	3,500	3,000	2,500	2,000	1,500
Contribution/unit (Rs.)	2,000	2,500	3,000	3,500	4,000
Total contribution (Rs. 000)	7,000	7,500	7,500	7,000	6,000

(c)(ii) Maximum contribution of Rs. 7.5 million can be generated at selling price per unit of Rs. 6,500 or Rs.7,000;

Sun division will no longer make contribution on internal sales.

Total contribution of Moon division is Rs. 7.5 million.

General comments

A four part question set to test the candidates' understanding of the transfer pricing principles.

Specific comments

Part (a) Instead of calculating the contributions earned by each division, some candidates have calculated the contribution per unit produced by each division. Many of them failed to recognize the fact that the company's contribution equals to sum of contributions of the two divisions.

Part (b) Some who followed the MR = MC method failed to derive the correct equation for MR due to making mistakes in taking the derivative of $R = 9500 – x^2$. A significant number of candidates had taken the derivative as $9500 – x$. Some had equated this to an incorrect MC value.

Part (c) Most of the candidates failed to recognize that MC = 4000 (i.e.) from the company's point of view optimal decision making occurs when transfer pricing occurs at company's variable cost.

Part (d) poorly answered. Many were content to compare the answers (a), (b) and (c) and just stated that (c) is the best option. Candidates failed to state that sun division need to be compensated for contribution lost on internal sales.

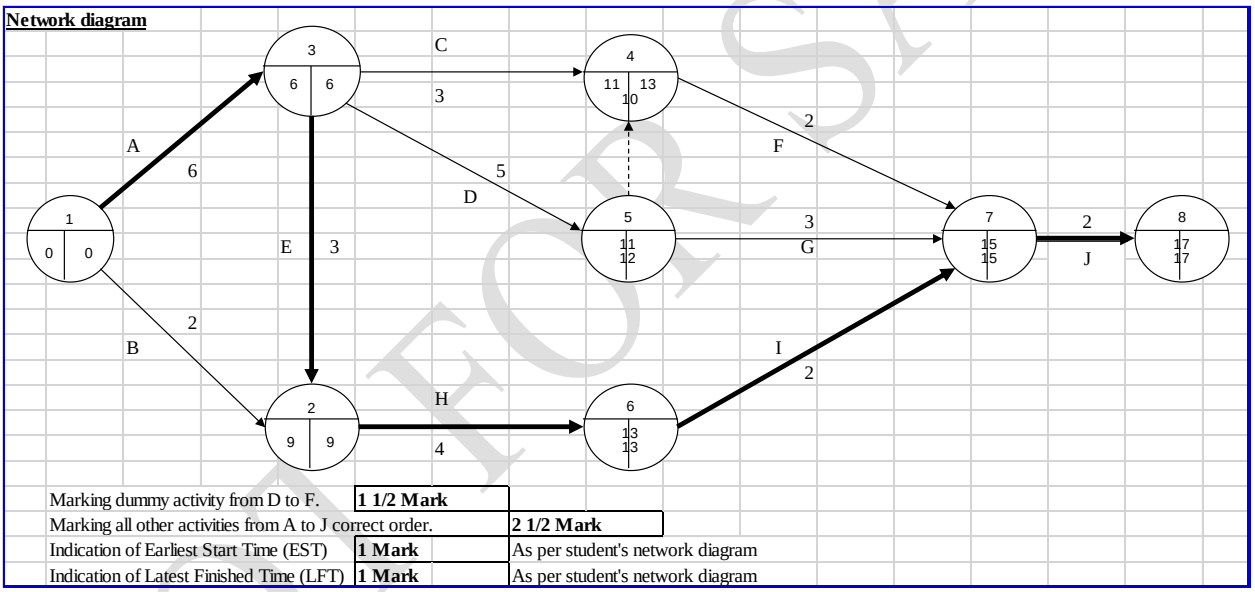
In Parts (c) and (d) some candidates who had used the alternate method had failed to prove that a particular selling price is a maximum by comparison with the total contribution of the immediately preceding and succeeding levels.

Answer No. 05

(a)

Activity	Immediate Predecessor	Activity Times Optimistic	Most Probable	Pessimistic	Expected	Var			
A	-	4	5	12	6	1.78	1.78		1.33333
B	-	1	1.5	5	2	0.44			
C	A	2	3	4	3	0.11			
D	A	3	4	11	5	1.78			
E	A	2	3	4	3	0.11	0.11		0.33333
F	C	1.5	2	2.5	2	0.03			
G	D	1.5	3	4.5	3	0.25			
H	B, E	2.5	3.5	7.5	4	0.69	0.69		0.83333
I	H	1.5	2	2.5	2	0.03	0.03		0.16667
J	F, G, I	1	2	3	2	0.11	0.11		0.33333
* Activities D & F cannot be done together as the two activities require the same equipment							2.72	1.64992	

Network diagram



Marking dummy activity from D to F.	**1 1/2 Mark**	
Marking all other activities from A to J correct order.		**2 1/2 Mark**
Indication of Earliest Start Time (EST)	**1 Mark**	As per student's network diagram
Indication of Latest Finished Time (LFT)	**1 Mark**	As per student's network diagram

Computation of expected activity durations
Please refer the Network diagram

Students should display that they have considered the fact that D and F cannot be performed simultaneously thus they should be performed one after the other.

Considering the EST of the activities D can start before F, therefore D is considered a predecessor for F. This results in a dummy activity being introduced as shown in the diagram

(b) Critical Path A - E - H - I - J
Expected project duration is 17 weeks
SD = $\sqrt{(1.78 + 0.11 + 0.69 + 0.03 + 0.11)}$ = 1.65 weeks

(c) If fixing of cameras is introduced, importation also need to be introduced. Importation will start from the beginning, along with A and B and finish right at the end along with J. But this activity (importation) will take 20 weeks thus will be the sole critical activity. Fixing of cameras will start from the last event of which EST and LFT will be 20

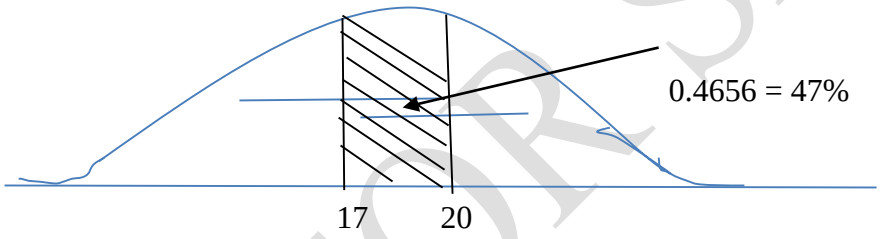
(d) Fixed cost will be: 100,000 x 21 weeks = 2,100,000

A-J can take 20 weeks as cameras can be fixed only thereafter.
Therefore the probability that A-J as a whole will not exceed 20 weeks

$$Z = \frac{20 - 17}{1.65} = 1.82$$

Area from mean 'A' = 0.4656 = 46.56%

This can be shown in graphically too;



(e) Since activities A-J takes 17 weeks anyway, fixing of cameras cannot be commenced till the end of 17 weeks. Therefore if part reduction is not possible it is not worth to incur Rs 350,000 since the saving is only Rs 300,000 ((20-17)*100000).

Alternatively;

Current Fixed cost for 21 weeks	2,100,000
Revised period (21-3)	18 weeks
Revised Fixed cost for 18 weeks	1,800,000
Additional cost	350,000
Revised total cost	2,150,000

Since the revised cost is higher importation of CCTV cameras should not be sped up.

Specific comments

Part (a) though the majority of the candidates scored satisfactory marks in this part, many were lost marks for their failure to recognize the dummy activity between activities D and F and incorrect calculation of EST and LFT.

Part (b) many could not identify the critical path correctly due to their inability to calculate EST and LFT correctly and/or their failure to identify AEHIJ as a path.

Majority of the candidates could not correctly calculate the standard deviation due to application of incorrect formulae.

Part (c) many could not identify this as a separate activity with no immediate predecessor. Some had identified this to occur after activity with an activity time of one week. Only a few had stated that this activity will be the sole critical activity.

Part (d) Only few could correctly calculate the probability that A-J as a whole will not exceed 20 weeks. Many were not familiar with calculating the Z value and reading the applicable probability.

Part (e) fairly answered by those who attempted this part.

Answer No. 06

(a) Life cycle costing estimates and accumulates costs over a product's entire life cycle in order to determine whether the profits earned during the manufacturing phase will cover the costs incurred during the pre and post manufacturing stages. The price of the product will be determined taking into account the total accumulated cost of the product life cycle.

(b)

Cost component		Rs. million
Development cost		20.00
Material costs = 350+1430+720		2,500.00
Labour cost = 70+480+240		790.00
Marketing costs = 100+80+20		200.00
Other overheads = 70+130+100		300.00
Machine utilisation = (100-10)		90.00
Total cost of product life cycle		**3,900.00**
Expected sales quantity -phones (70,000+300,000+150,000)		520,000
Cost per phone	Rs.	7,500
Profit Margin @ 30%		2,250
Expected price	**Rs.**	**9,750**

(c) * This helps to measure the profitability taking into account all the cost to be incurred during the entire lifecycle. Therefore it helps to **avoid underpricing.**

* Since costs and revenue is known, **prior decision** for generating revenue or lowering costs is possible.

(d) Target costing involves matching **a target cost** by **deducting a desired profit from a price which is accepted in the market**. In other words, target costing is an attempt to match a given market price by ways of reducing costs/margins.

	Rs.
Market price per unit	9,100
Margin required (9100/ 130 * 30)	2,100
Therefore target cost per unit is	**7,000**

DCE should match its cost to Rs. 7,000 per phone before introducing it to the market.

Therefore DCE should find strategies to reduce the cost to Rs. 7,000 per unit from the current cost of Rs. 7,500. Management may consider the following;

- Management would **seek the ways and means to reduce the cost of manufacturing** by redesigning the product, **eliminating non-value added features**, **carrying out teardown analysis of competitor's products** etc.

- If the cost reductions are not possible, management would decide **to start manufacturing the product** since it still has **a margin of 21% at the price of Rs. 9,100**.

- If cost reductions are not possible and management feels that the margin of 21% is not sufficient they would decide to **abandon the product**.

Examiner's comments

Part (a) fair population of candidates incorrectly described the life cycle cost of a product, instead of stressing on accumulation of costs during the life cycle. Life cycle costs' significance in recovering its entire costs during the sales period reflecting the correct pricing strategies in advance was not emphasized.

Some candidates failed to mention the importance of LCC as a tool for price fixing with a bearing on accumulated cost. (Emphasis was placed on the cost aspect only) Lack of knowledge on principles of LCC was witnessed due to absence of inclusion of pre-manufacturing (design and development) and post manufacturing cost in LCC.

In Part (b) noticed that poor application of LCC principle in the following areas.

- No attempts were made to identify the cost elements to different phases of the life cycle, and compute the desired price. This basis closely shows the knowledge of theory and its application in a given situation.

- Some candidates had calculated each years' cost/unit and selling price and had arrived at desired selling price summation of 3 years and obtaining an average of those three years.

- Mark-up was based on selling price and not on life cycle cost as required in the sum.

In part (c) The following weaknesses were observed

- Large number of candidates compared life cycle costing with traditional costing. But its advantages in receiving total costs by avoiding underpricing and maintaining profitability was not highlighted.

- Only a small percentage stressed on positive aspects in decision making, since all costs and revenue during the life cycle were known in advance.

In part (d) many candidates failed to appreciate the importance of origination from market price acceptable to the market in target costing principle. Instead of market price emphasis was placed in selling price.

Very few attempts were made to resort to reduce mark-up and match the new market price, where cost reduction is not possible.

No student had suggested the abandoning of the product, if cost reduction is impossible and where reduced margins are not acceptable to the company.

Large number of candidates suggested the reduction of cost, but only a fair proportion discussed about the elimination of non-value adding features and teardown analysis (less than 5%).