THE INSTITUTE OF COST AND MANAGEMENT ACCOUNTANTS OF BANGLADESH
CMA DECEMBER, 2018 EXAMINATION
PROFESSIONAL LEVEL-III
SUBJECT: 302. ADVANCED COST ACCOUNTING

Model Solution

Solution of Question No. 1:
Req. – (i):

Calculation of unit lost during July 2018:

	Department-A	Department-B
Units in process July, 1	5,000	14,500
Units started and from preceding Deptt.	10,000	11,000
Total units to accounts for	15,000	25,500
Units completed & transferred	11,000	22,000
Units in process, July 31	4,000	3,000
Total units accounted for	15,000	25,000
Units lost during July	Nil	500

Req. – (ii):

Calculation of equivalent production:

Department –A:

Flow of production	Physical unit	Equivalent units	
		Materials	Labour & Overhead
Units completed & transferred	11,000	11,000	11,000
Units in process, July 31 (Materials 50%, Labour & Overhead 60%)	4,000	2,000	1,200
Total		13,000	12,200

Department –B:

Flow of production	Physical unit	Equivalent units		
		Transferred in	Materials	Labour & Overhead
Units completed & transferred	22,000	22,000	22,000	22,000
Units in process, July 31 (Transferred in 100%, Materials 0%, Labour & Overhead 65%)	3,000	3,000	-	1,950
Lost units (Transferred in 100%, Materials 0%, Labour & Overhead 50%)	500	500	-	250
Total		25,500	22,000	24,200

Req.-(iii):

Cost of Production Report

	Department-A			Department-B			
	Total	Materials	Labour & overhead	Total	Transferred in	Materials	Labour & overhead
Cost charged to the department :							
Work in process July 1	4,600	2,950	1,650	31850	30100	-	1750
Cost added during July	19,380	10,050	9330	33450	20900	2200	10350
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Total cost to be accounted for	23980	13000	10980	65300	51,000	2200	12100
Equivalent Units	-	13,000	12,200	-	25500	22,000	24200
Cost per equivalent unit	1.90	1.00	0.90		2.00	0.10	0.50
Application of costs :							
Finished goods transferred/shipped	20900	11000x1 =11000	11000x0.90 =9900	57200	22000x2 = 44000	=22000 x0.1 =2200	22000x0.50 =11000
				6975		-	
Units in process, July 31	3080	2000x1 =2000	1200x0.90 =1080		3000x2 =6000	- - -	1950x0.50 =975
Lost units	-	-	-	1125	500x2 =1000		250x0.50 =125
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Total cost accounted for	23980 =====			65300 =====			

Solution of Question No. 2:

Req.-(i):
Profit lost by selling unreworked defect units = (Total defective units – Number of units reworked) x (Profit per good unit sold – Profit per defective units sold)
= Tk.((12000 – 2400) x (80 – 50))
= Tk.(9600 x 30)
= Tk.288000

Req. (ii):
Total rework cost = Number of units reworked x Cost to rework a defective unit
= Tk.(2400 x 25)
= Tk.60000

Req. (iii):
Cost of processing customer returns = Number of defective units returned x Cost to process a returned unit
= Tk.800 x 20)
= Tk.16000

Req. (iv):
Total failure cost = Profit lost by selling unreworked defect units + Rework cost + Cost of processing customer returns + Cost of warranty work + Cost of work recalls + Cost of litigation related to Products + Opportunity cost of lost customers.
=Tk.(288000 + 60000 +16000 +10000+140000+100000)
= Tk.614000

Req. (v):
Total quality cost = Total prevention cost + Total appraisal cost + Total failure cost
= Tk.(170000 + 27200 + 614000)
= Tk.811200

Solution of Question No. 3:

Required-i:

Material Price variance = (Standard Price – Actual Price) x Actual Quantity Purchased
Material P = (500 – 540) x 2000 = 80,000(Adverse)
Material Q = (350 – 370) x 1200 = 24,000(Adverse)
Material R = (250 – 240) x 500 = 5,000(Favorable)

Material Mix Variance = (Revised Standard quantity – Actual quantity requisitioned) x Standard Price
Material P =(1705 – 1870)x 500 = 82500(Adverse)
Material Q =(1364 – 1100)x 350 = 92400 (Favorable)
Material R = (341 – 440)x 250 = 24750 (Adverse)

Material Yield Variance = (Standard output – Actual output) x Average standard cost per unit
= (3100 – 3234) x 456.50 = 61171(Favorable)

W – 1: Revised Standard quantity = Total Actual quantity requisitioned x Percentage of input quantity.

Material P = 3410 x 50% = 1705
Material Q = 3410 x 40% = 1364
Material R = 3410 x 10% = 341

W – 2:
$$\text{Standard output} = \text{Total Actual quantity requisitioned} \times \frac{100}{110} = 3410 \times \frac{100}{110} = 3100$$

Required – ii:

Labour rate variance = (Standard Rate – Actual Rate) x Actual labour hour
= (75.00 - 79.50) x 15,800 = 71100(Adverse)

Labour efficiency variance = (Standard hour allowed for input - Actual hours) x Standard Rate
=(15500 – 15800) x 75
= 22500(Adverse)

Labour Yield variance = (Standard output - Actual output) x Standard labour cost per unit
= (3100 – 3234)x 375 = 50250(Favorable)

Required – iii :

Factory overhead spending variance = TAOH – [(VOH Rate x AH) + BFOH]
=195650 – [(5 x 15800) +123750]
=195650 – (79000+123750)
= 195650 – 202750
= 7100 (Favorable)

Idle capacity variance = [(VOH Rate x AH) + BFOH] – (AH x SR)
= [(5 x 15800) +123750] – (15800 x 12.50)
= (79000+123750) – 197500
= 202750 – 197500
= 5250 (Adverse)

Overhead efficiency variance = (Actual labour hour – Standard hour allowed for input) x Standard overhead rate
= (15800 – 15500) x 12.50
= 3750 (Adverse)

Yield variance = (Standard hour required for actual output - Standard hour allowed for input) x Standard overhead rate)
= [(3234 x 5) – 15500)] x 12.50
= (16170 – 15500) x 12.50
= 8375(Favorable)

W – 3 : Total actual overhead(TAOH) = Total fixed overhead + Total variable overhead
= 110750 + 84900 = 195650

$$\text{W – 4 : Variable overhead (VOH) rate per hour} = \frac{82500}{16,500} = \text{Tk.5}$$

$$\text{W – 5 : Standard hours allowed for input} = \frac{500}{110} \times 3410 = 15500 \text{ hours}$$

W – 6 :

$$\text{Standard Rate(SR)} = \frac{\text{TBOH}}{\text{Normal Labour hour}} = \frac{123,750 + 82,500}{16,500} = \frac{206250}{16,500} = 12.50$$

W – 7 :

$$\text{Standard overhead rate per hour} = \frac{\text{Budgeted fixed overhead + Budgeted variable overhead}}{\text{Normal Labour hour}}$$

$$= \frac{\mathbf{123,750+82,500}}{16500} = \frac{\mathbf{206250}}{16500} = \text{Tk. } 12.50$$

Solution of Question No. 4:

i) Net profit

	P	Q	Total
Contribution per unit	30	26	
Less: Fixed OH per unit	10	6	
Profit per unit [a]	20	20	
Units [b]	120,000	45,000	
Total [a × b]	2,400,000	900,000	3,300,000

Management is indifferent on the basis of profit per unit however this is wrong concept on selecting the product mix.

ii) Product mix

	P	Q
Contribution per unit [a]	30	26
Limiting time / unit [b]	0.02	0.015
Contribution / hr. [a ÷ b]	1500	1733.33
Rank	II	I

Statement of product mix & profit

	Hours	**Units**	**Contribution/unit**	**Total**
Available	3,075			
Less: For Q	810	54,000	26	1,404,000
For P	2,265	113,250	30	3,297,500
				4,801,500
Less: Fixed cost				1,470,000
Profit				3,331,500

(iii) Return per bottleneck hour = (selling price – material cost)/ (Time on bottleneck resource)
Product P = Tk. 2,900 [(Tk. 60 – Tk. 2) / 0.02 hours]
Product Q = Tk. 2,000 [(Tk. 70 – Tk. 40) / 0.015 hours]
Product P should be sold up to its maximum capacity of utilizing 2,880 bottleneck hours (1,44,000 units × 0.02 hours). This will leave 195 hours for product Q thus enabling 13,000 units (195/0.015) to be produced.

The maximum profit is calculated as follows:

	Tk.
Throughput return from product P (144,000 × Tk. 58)	8,352,000
Contribution from product Q (13,000 × Tk. 30)	390,000
	8,742,000
Less: Variable overheads	3,540,000
Fixed overhead cost	1,470,000
Net profit	3,732,000

Note:
It is assumed that the variable overheads (e.g. direct labor) are fixed in the short term. They are derived from part (a) – [(120,000 × Tk. 28) + (45,000 × Tk. 4)]

Note 1:

	P	Q
Direct material cost	2	40
Variable manufacturing overhead cost	28	4
Total variable cost	30	44
Selling price	60	70
(a) Contribution	30	26
(b) Limiting factor (hour per unit)	0.25	0.15
(c) Contribution per hour [a ÷ b]	120	173.33
(d) Rank	II	I
(e) Budgeted production and sales	120,000	45,000
(f) Maximum demand	144,000	54,000
Total fixed costs	1,470,000	

Note-2:

Fixed overhead recovery rate= (Amount ÷ Budgeted hours) = 1,470,000 ÷ 36,750 = Tk. 40/hr.
Budgeted hours:
P - 120,000 units @ 0.25 = 30,000 hrs.
Q - 45,000 units @ 0.15 = 6,750 hrs.
36,750 hrs.

Solution of Question No. 5 (a):

Target profit	25,000
Add: Fixed cost	140,000
Add: Additional Advertisement	28,500
(a) Total contribution	193,500
(b) Required sales volume	12,000
Contribution per unit [a ÷ b]	16.125
Target Selling price per unit	32
Less: Contribution/unit	16.125
Target variable cost per unit	15.875
Less: material cost per unit	8.000
Labor + Variable Overhead	7.875

Labor: X hour @ Tk. 4
Variable overhead: X hour @ Tk. 0.5

∴4.5X =	7.875
X (hour)	1.75
Time per unit	1.75
Present	2.00
Time reduced	0.25 hour

(b)

The cost of the product over its life cycle would be as follows irrespective of fluctuations in production (demand) from year to year.

Variable Cost:	330,000
Fixed cost:	250,000
Total estimated costs during product life	580,000
Estimated total production	165,000
Average cost per unit (Rs.)	3.52

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