Model Solution

Answer to the question no. 1

Statement of equivalent production (weighted average)

Input Units	Particulars	Output units	Equivalent units	
			Materials	Conversion Costs
4000	Opening WIP			
16000	Introduced and Completed and transferred to next department	14400	14400	14400
	Normal Spoilage	1440	1440	1440
	Abnormal Spoilage	1160	1160	1160
	Closing WIP	3000	3000	2000
20000		20,000	20,000	19000

Statement of Costs

	Materials	Conversion Costs
Opening	**30000**	**29,200**
Costs in process	**120000**	**160800**
Total (a)	**150000**	**190000**
Equivalent units (b)	**20000**	**19000**
Cost per unit (a÷b)	**7.50**	**10.00**

Statement showing distribution of costs

Particulars	Equivalent units	Costs per unit	Amount	
Units Completed				
Materials	14400	7.50	108000	
Conversion Costs	14400	10.00	144000	**2,52,000**
Normal Spoilage	1440	17.50		**25,200**
Closing Stock				
Materials	3000	7.50	22500	
Conversion Costs	2000	10.00	20000	
				42500
Abnormal Spoilage				
Materials	1160	7.50	8700	
Conversion Costs	1160	10.00	11600	
				20300

Process Account

Particulars				
Opening WIP	59200	**Profit and Loss (abnormal Loss)**	20300	
Materials	120000	**Transferred to next department**	2,77,200	
Conversion Costs	160800	**Closing Stock**	42,500	
	340000		340000	

Answer to Question no. 2 (a)

Required: (a) (i)

Sales Mix Gross Profit Variance:

	Actual Sales quantity (units)	Actual Sales at budget mix (units)	Difference (units)	Standard gross profit TK	Variance TK
Anti-ageing cream	250,000	243,750	6,250 F	34.00	212,500 F
Facial masks	260,000	284,375	24,375 A	20.00	487,500 A
Collagen fillers	140,000	121,875	18,125 F	22.00	398,750 F
	650,000	650,000			123,750

Required: (a) (ii)

Sales Quantity Gross Profit Variance

	Actual Sales quantity (units)	Actual Sales at budget mix (units)	Difference (units)	Standard gross profit TK.	Variance TK.
Anti-ageing cream	240,000	243,750	3,750 F	34	127,500 F
Facial masks	280,000	284,375	4,375 F	20	87,500 F
Collagen fillers	120,000	121,875	1,875 F	22	41,250 F
	640,000	650,000			256,250 F

Required: (a)(iii)

The sales mix gross profit variance identifies the effect on profit of a change in the mix of product sales. It compares the actual quantity of products sold at the budgeted mix with the actual mix of products sold. From the figures calculated in part (b) we can see that the change in the sales mix has resulted in an increase in profit of TK.123,750. The change in the sales mix has resulted in a relatively higher proportion of sales of the anti-ageing cream and collagen fillers which are the products that earn the highest profit per unit and a lower proportion of sales of facial masks which have a relatively lower profit per unit. This is important information for future planning and pricing purposes. An overall increase in quantity of products sold may not result in an increase in profits if the increased sales are from a lower margin product at the expense of products with a higher profit margin.

Answer to Question no. 2 (b)

Required: (b)

Increased awareness of the impact of environment related activities on their financial statements
Organisations that use an environmental costing system will have greater awareness of the impact of environment related activities on their financial statements. This is because conventional management accounting systems tend to attribute many environmental costs to general overhead accounts with the result that they are "hidden" from management.

Cost control / reduction
Organisations which adopt environmental cost management principles are more likely to identify and take advantage of cost reduction and other improvement opportunities. Identifying and monitoring the usage and cost of resources such as water, electricity and fuel will result in better control of the cost of these resources and identification of potential for cost reduction.

More accurate product costs / improved decision making
A good environmental costing system will produce more accurate product costs. This will reduce the chances of employing incorrect pricing of products and services and taking the wrong options in terms of mix and development decisions. Lack of cost information can result in the cross subsidisation of environmentally damaging products.

Environmental risk management
Improved environmental cost information will enable environmental considerations to form part of investment decisions. The likelihood and impact of environmental risks can also be assessed.

Answer to the question no. 3 (a)

Throughput time	Process time + Inspection Time + Move Time + Queue Time = 2.80 days + 0.5 days +0.7 days + 4 days = 8.0 days
The manufacturing cycle efficiency (MCE)	Only process time is value added time; therefore is: Value added time/throughput time = 2.8 days/8 days = 0.35
% of time spent in non-value added activities	= 1-0.35 = 0.65
Delivery cycle time	Wait Time + Throughput Time 16.00 days + 8 days =24 days
The manufacturing cycle efficiency (MCE) under JIT	If the all queue time in production is eliminated, then throughput time drops to only 4 days. MCE = 2.8 days/4 days =0.7 Thus the MCE increases to 70%. This exercise shows quite dramatically how the JIT approach can improve operations and reduce throughput time.

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Ans. to the question no. 3 (b)

The costs of quality

Quality costs are divided into compliance costs (or 'conformance costs') & costs failure to comply (nonconformance costs).

<u>Conformance costs</u> are further divided into **prevention costs**(incurred in preventing mistakes from happening) and **appraisal costs**(incurred in looking for mistakes before a product is manufactured).

i. **Prevention costs** are the costs of ensuring that defects do not occur in the first place. For example:
   - Routine preventive repairs and maintenance to equipment.
   - Quality training for operatives to improve skills and efficiency.
ii. **Appraisal costs** are connected with measuring conformity with reqirments and include:
   - Cost of incoming inspections(note that if suppliers adopt a total quality approach, the cost of incoming inspections can be eliminated)
   - Cost of set-up inspections
iii. **Internal failure** costs include:
   - Costs of scrap
   - Reworking costs
iv. **There** are several measurable costs of external failure to deliver a quality product.
   - Marketing costs associated with failed products and loss of customer goodwill
   - Manufacturing or process engineering costs relating to failed products

Prevention Costs	Internal Failure Costs
Quality Engineering	Net cost of scrap
System Development	Re-work Labor
Statistical Process Control	Disposal of defective products
Appraisal Cost	**External Failure Costs**
Inspection	Cost of field servicing
Production Testing	Warranty repairs
Supplied used in Testing	Product recalls
Dep. of Testing Equipment	

Answer to Question no. 4 (a)

Post separation costs per unit are £19,600 / 2,800 = £7 per litre

Notional price at separation point is £10·50 - £7 = £3·50 per litre

Weighted sales value is	P	3,600 x £4·60 =	£16,560
	Q	4,100 x £6·75 =	£27,675
	R	2,800 x £3·50 =	£9,800
			£54,035

Allocation of common process costs to R is £42,500 x (£9,800 / £54,035) = £7,708

Answer to Question no. 4 (b)

Required: (i)

Performance report for the quarter ending October 2016

	Budget	*Flexed Budge*	*Actual*	*Variance*

				TK.000	
Sales units	12,000	13,000	13,000		
Production units	14,000	13,500	13,500		
	TK.000	*TK.000*	*TK.000*	*TK.000*	
Sales	<u>360</u>	<u>390</u>	<u>385</u>	<u>5</u>	A
Direct materials	70	67.5	69	1.5	A
Direct labour	140	135	132	3	F
Variable overhead	42	40.5	43	2.5	A
Fixed overhead	84	84	85	1	A
Inventory adjustment	<u>(48)</u>	<u>(12)</u>	<u>(12)</u>	<u>0</u>	
Cost of sales	<u>288</u>	<u>315</u>	<u>317</u>	<u>2</u>	A
Gross Profit	<u>72</u>	<u>75</u>	<u>68</u>	7	A

Required: (ii)

The original statement compared budgeted revenues and costs with actual revenues and costs. The resulting variances offer little insight into why the differences occurred. For effective performance review and control it is important the figures are compared on a 'like for like' basis: there is little point in comparing the actual costs of producing 13,500 units with the budgeted costs of producing 14,000 units. Therefore it is important that volume differences are taken out: this is the reason for flexing the budget.

The flexible budget does not offer enough detail for responsibility and control. The variances are 'total' variances and do not point to areas of individual responsibility. For example the total direct materials variance could be made up of a price variance and a usage variance. These variances will be the responsibility of different managers within the company.

Ans. to the question no. 5

(**i**) Throughput accounting ratio = throughput return per factory hour/cost per factory hour.

Cost per factory hour
Total factory costs/total available hours on bottleneck resource
= Tk.12,000,000/2,700 hours (12 x 5 x 50 x 90% hours)
= Tk.4,444·44

Throughput return	Large panels	Small panels
Selling price per unit	12,600	3,800
Material costs per unit	4,300	1,160
Throughput per unit	8,300	2,640
Hours per unit required on Machine M	1·4	0·6
Throughput return per hour	5,928.57	4,400

Throughput accounting ratio

Throughput return	Large panels	Small panels
Throughput return per factory hour	5,928.57	4,400
cost per factory hour	4,444·44	4,444·44
	1·33	0·99

In any organisation, one would expect the throughput accounting ratio to be greater than 1. This means that the rate at which the organisation is generating cash from sales of this product is greater than the rate at which it is incurring costs. It follows on, then, that if the ratio is less than 1, changes need to be made quickly. Whilst the ratio for large panels is more than 1, it is just under 1 for small panels. However, if changes are made as suggested in (c) below, this could soon be rectified.

(ii) Optimum production plan
Product No. of units Hours per unit Total hours T/P per hour Total T/P

Products	No. of Units	Hrs per unit	Total hrs	T/P per hour	Total T/P
Small panels (under contract)	1,000	0.6	600	$4,400	$2,640,000
Large panels	1,500 (2,700-600)/1.4	1.4	2,100	$5,928·57	$12,449,997
Total			2,700		$15,089,997
Less: Factory Costs					($12,000,000)
Profit					$3,089,997

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