Marks

Question No: 2

(a) (i) Linear Programming:

Linear programming is a mathematical technique concerned with the allocation of scarce resources. It is a procedure to optimize the value of some objective when the factors involved are subject to some constraints.   ½

Linear programming is the use of a series of linear equations to construct a mathematical model. The objective is to obtain an optimal solution to a complex operational problem, which may involve the production of a number of products in an environment in which there are many constraints.   ½

Requirements/ Conditions for solving a Problem:

❑   The problem must be capable of being stated in numeric terms.   ½

❑   All factors involved in the problem must have linear relationships e.g., a doubling of output requires a doubling of labour hours; of one unit provides Rs.1,000 contribution 10 units will produce Rs.10,000 and so on.   1

❑   The problem must permit a choice or choices between alternative courses of action.   ½

❑   There must be one or more restrictions on the factors involved. These may be restrictions on resources (labour hours, tonnes of material etc.) but they may be on particular characteristics.   1

(ii) Objective Function:

$$\text{Minimize:} \quad 20x_1 + 40x_2 + 55x_3$$ 1½

where x_1 = number of kgs of Item ⸢A⸥   ½

x_2 = number of kgs of Item ⸢B⸥   ½

x_3 = number of kgs of Item ⸢C⸥   ½

(b) (i) Time Restriction:

For Car-A Maximum Number of Units:

Auto Tech 4,000 hours ÷ 0.6   =   6,666 units

Auto Sign 4,500 hours ÷ 0.5   =   9,000 units

Therefore, Brother Engineering Ltd., can produce 6,666 units of Car-A.   1

For Car-B Maximum Number of Units:

Auto Tech 4,000 hours ÷ 0.25   =   16,000 units

Auto Sign 4,500 hours ÷ 0.55   =   8,181 units

Therefore, Brother Engineering Ltd., can produce 8,181 units for Car-B.   1

Material Restriction:

13,000 kgs ÷ 1.6 kgs   =   8,125 units

Therefore, Brother Engineering Ltd., can produce 6,666 units of Car-A or 8,125 units for Car-B.   1

STRATEGIC MANAGEMENT ACCOUNTING – SEMESTER-6

Marks

Question No: 2

Contribution Margin:

Rupees

For Car-A:

Sales	6,666 x	Rs. 21,750		144,985,500
Material	6,666 x 1.6 x	Rs. 1,875	19,998,000	
Variable overhead Auto Tech	6,666 x 0.6 x	Rs. 12,000	47,995,200	
Variable overhead Auto Sign	6,666 x 0.5 x	Rs. 15,000	49,995,000	117,988,200
				26,997,300	2

For Car-B:

Sales	8,125	x Rs. 17,250		140,156,250
Material	8,125 x 1.6 x	Rs. 1,875	24,375,000	
Variable overhead Auto Tech	8,125 x 0.25 x	Rs. 12,000	24,375,000	
Variable overhead Auto Sign	8,125 x 0.55 x	Rs. 15,000	67,031,250	115,781,250
				24,375,000	2

Therefore, Brother Engineering Ltd., should produce part for Car-A as it yields relatively higher contribution.   1

(ii) The Company will earn a maximum of Rs. 26,997,300.   1

It cannot meet the maximum demand due to the limitation on the capacity of Auto Tech.   1

(iii) New Contribution Margin:

Rupees

Sales for Car-A	Rs. 144,985,500 x 0.90	130,486,950
Cost		117,988,200
Reduced Contribution		12,498,750	1
Add: Payment for reduced machine hour		
Auto Tech No spare capacity	[(4500 – (6,666 x 0.5)] x 9,000	10,503,000
New contribution margin for Car-A		**23,001,750**	1
Sales for Car-B	Rs. 140,156,250 x 0.90	126,140,625	1
Cost		115,781,250
		10,359,375
Add: Payment for reduced machine hour		
Auto Tech	(4,000 – 8,125 x 0.25) x 9,000	17,718,750
Auto Sign	(4,500 – 8,125 x 0.55) x 9,000	281,250
New contribution margin for Car-B		**28,359,375**	1

Therefore, decision will be changed to produce for Car-B which will give a contribution of Rs. 28,359,375.   1

Marks

Question No: 3

(a) Total Cost of Purchasing from Outside:

	Rupees	
Cost of purchasing 24,000 units @ Rs.300 each	7,200,000	
Direct Labour retention cost	2,400,000	1
Allocated Fixed overheads	750,000	1
Total cost of purchasing outside	10,350,000	1
Total per unit Cost for purchasing outside	431.25	
Total per unit Cost for producing	356.25	
Loss per unit from purchasing outside	75.00	1

Decision: Reject the offer.   1

(b) Change in decision of (a) above, if facilities can be used to upgrade the washing machine:

		Rupees	
Incremental Revenue	(Rs. 550 x 24,000)	13,200,000	1
Incremental Cost	(Rs. 450 x 24,000)	(10,800,000)	1
Additional tooling cost		(400,000)	
Total incremental profit		2,000,000	1
Incremental profit per unit		83.33	1
Loss per unit from purchasing outside		(75.00)	
Profit per unit from purchasing outside after incremental profit		8.33	1

Decision: Yes, it is advised to accept the offer.   1

(c) Manufacturing 4,000 units of spindle per batch, if facilities will be used as stated in (b) above with:

	Rupees	
Assuming that total No. of batches was (24,000/2,000)	12	1
Cost per batch (600,000/12)	50,000	1
Total No. of batches when batch size increased (24,000/4,000)	6	
Cost saving – quality control and down time (50,000 x 6)	300,000	1
Machine leasing cost	600,000	
Total cost at 4,000 batch size	(300,000)	1
Loss per unit at 4,000 batch size (50,000 ÷ 4,000)	(12.50)	1
Net loss as per (b) (8.33 – 12.50)	(4.17)	1

OR		
Assuming that total No. of batches was (24,000/2,000)	12	1
Cost per batch (600,000/12)	50,000	1
Total No. of batches when batch size increased (24,000/4,000)	6	
Cost saving quality control and down time (50,000 x 6)	300,000	1
Per unit cost of producing the spindles (as given)	356.25	
Per unit cost saving when batch size increased (300,000/24,000)	(12.50)	1
Incremental profit when facilities used to upgrade (as (b) above)	(83.33)	
Net cost of in-house production	260.42	1
Cost of purchasing (as (a) above)	431.25	
Net loss from outside purchase or benefit of in-house production	170.83	1

Decision: In this case, offer should be rejected.   1

STRATEGIC MANAGEMENT ACCOUNTING – SEMESTER-6

Marks

Question No: 4

Rs. in million

Proposal (a)	Present Shaikhupora	Present Faisalabad	Additional Faisalabad	Total Faisalabad	Group Total	
Sales units	160,000	120,000	30,000	150,000	310,000	1
Sales	6,000.00	4,500.00	1,125.00	5,625.00	11,625.00	
Variable cost	3,300.00	2,925.00	731.25	3,656.25	6,956.25	
Variable distribution cost	–	–	18.00	18.00	18.00	1
Contribution Margin	2,700.00	1,575.00	375.75	1,950.75	4,650.75	
Fixed cost:				–	–	
Factory	1,200.00	600.00	60.00	660.00	1,860.00	1
Selling and Admin	750.00	225.00	11.25	236.25	986.25	1
Home office share	375.00	375.00	225.00	600.00	975.00	
Profit (Loss)	**375.00**	**375.00**	**79.50**	**454.50**	**829.50**	1
			OR	3 + 1 + 1 =		5

Proposal (b)	Present Faisalabad	Present Shaikhupora	Additional Shaikhupora	Total Shaikhupora	Group Total	
Sales units	120,000	160,000	32,000	192,000	312,000	1
Sales	4,500.00	6,000.00	1,200.00	7,200.00	11,700.00	
Variable cost	2,925.00	3,300.00	660.00	3,960.00	6,885.00	
Variable distribution cost			24.00	24.00	24.00	1
Contribution Margin	1,575.00	2,700.00	516.00	3,216.00	4,791.00	
Fixed cost:				–	–	
Factory	600.00	1,200.00	240.00	1,440.00	2,040.00	1
Selling and Admin	225.00	750.00	75.00	825.00	1,050.00	1
Home office share	375.00	375.00	225.00	600.00	975.00	
Profit (Loss)	**375.00**	**375.00**	**(24.00)**	**351.00**	**726.00**	1
			OR	3 + 1 + 1 =		5

Marks

Question No: 4

Rs. in million

Proposal (c)	Present Shaikhupora	Present Faisalabad	Sialkot	Group Total	
Sales units	160,000	120,000	30,000	310,000	
Sales	6,000.00	4,500.00	22.50*	10,522.50	1
Variable cost	3,300.00	2,925.00	—	6,225.00	
Variable distribution cost	—	—	—	—	
Contribution Margin	2,700.00	1,575.00	22.50	4,297.50	1
Fixed cost:				—	
Factory	1,200.00	600.00	—	1,800.00	
Selling and Admin	750.00	225.00	—	975.00	
Home office share	375.00	375.00	225.00	975.00	1
Profit (Loss)	**375.00**	**375.00**	**(202.50)**	**547.50**	

*Royalty   **OR**   2 + 1 = 3

Proposal (d)	Present Shaikhupora	Present Faisalabad	Sialkot	Group Total	
Sales units	160,000	120,000		280,000	
Sales	6,000.00	4,500.00		10,500.00	
Variable cost	3,300.00	2,925.00		6,225.00	
Variable distribution cost	—	—		—	
Contribution Margin	2,700.00	1,575.00		4,275.00	1
Fixed cost:				—	
Factory	1,200.00	600.00	—	1,800.00	
Selling and Admin	750.00	225.00	—	975.00	
Home office share	375.00	375.00	225.00	975.00	
Profit (Loss)	**375.00**	**375.00**	**(225.00)**	**525.00**	1

                                        OR   1 + 1 = 2

	Profitability (Rs. in million)	Ranked
Proposal (a)	829.50	1
Proposal (b)	726.00	2
Proposal (c)	547.50	3
Proposal (d)	525.00	4
Present	375.00	5

2

All proposals are more profitable than present situations.   1

However, Proposal (a) is best and gave increased revenue of Rs. 454.50 million.   1

Presentation =   1

STRATEGIC MANAGEMENT ACCOUNTING – SEMESTER-6

Marks

Question No: 5

(a)

Zarq Corporation
Flexible budget (36,000 units) for the month of January 2013

	Fixed (Rs."000")	Variable per Hour	Total Variable (Rs."000")	Total Budget (Rs."000")	Actual (Rs.'000")	Variance (Rs."000")	
Management and Supervision	450.00	—	—	450.00	450.00	—	
Shift premium	—	1.50	54.00	54.00	60.00	6.00	1
Employees benefits and pension cost	90.00	3.30	118.80	208.80	225.00	16.20	1
Inspection	300.00	3.75	135.00	435.00	420.00	(15.00)	1
Consumable supplies	90.00	2.70	97.20	187.20	190.50	3.30	1
Power for machinery	—	3.00	108.00	108.00	117.00	9.00	1
Lighting and heating	60.00	—	—	60.00	63.00	3.00	1
Rent, Rate and Taxes	135.00	—	—	135.00	135.00	—	
Repairs and maintenance	120.00	2.25	81.00	201.00	226.50	25.50	1
Materials handling	150.00	4.50	162.00	312.00	321.00	9.00	1
Depreciation of machinery	225.00			225.00	225.00		
Production administration	180.00			180.00	172.50	(7.50)	1
	1,800.00		**756.00**	**2,556.00**	**2,605.50**	**49.50**	**1**

				OR	1	+	9	=	10

(b) (i) Overhead Absorption Rate:

Overhead absorbed   (2,556,000 ÷ 36,000)   71.00   1

(ii) Total Amount Under/ Over-Spent:

Total amount over-spent   (2,605,500 – 2,556,000)   49,500   1

STRATEGIC MANAGEMENT ACCOUNTING – SEMESTER-6

Marks

Question No: 6

Texchem Corporation

WORKING: Qty. in Tonnes

	HUB	SITE	Total	
Production (tonnes)	6,000	7,500	13,500	
Raw material required (80 Tonnes for 100 tonnes production)	4,800	6,000	10,800	
Raw material available in local market	3,000	8,000	11,000	
Raw material purchase from outside	1,800	-	1,800	
	1 +	1 +	1	= 3

Note: Assume transfer of Raw material from SITE to HUB is not possible.

(a) Cost of Production Statement: Rs. in million

Cost of Raw Material:	HUB		SITE		Total	
	Total	Rs./ Tonne	Total	Rs./ Tonne		
From local market						
3,000 x 13,500	40.50	6,750	—	—	40.50	1
6,000 x 15,000	—	—	90.00	12,000	90.00	1
From outside: 1,800 x 17,250	31.05	5,175	—	—	31.05	1
Total Raw material cost	71.55	11,925	90.00	12,000	161.55	
Other variable cost	117.00	19,500	144.00	19,200	261.00	1
Total variable cost	188.55	31,425	234.00	31,200	422.55	
Fixed cost	75.00	12,500	90.00	12,000	165.00	1
Total cost	**263.55**	43,925	**324.00**	43,200	**587.55**	
OR	1 +	1 +	1 +	1 +	1	= 5

(b) Quantity of Production: Qty. in Tonnes

	HUB	SITE	Total	
Raw Material available in local market	3,000	8,000	11,000	
Production can made from local material	3,750	10,000	13,750	1
Present production (tonnes)	6,000	7,500	13,500	
Total capacity	7,500	12,500	20,000	1
Under utilized capacity	1,500	5,000	6,500	1
Raw Material Required (80 tonnes for 100 tonnes production)	4,800	6,000	10,800	
(Short) or excess Raw material	(1,800)	2,000		
Additional production to meet other unit's demand		1,800		1

(c) Revised Cost of Production Statement: Rs. in million

Cost of Raw Material	HUB		SITE		Total	
	Total	Rs./ Tonne	Total	Rs./ Tonne		
From local market						
3,000 x 13,500	40.50	10,800	—	—	40.50	1
7,800 x 15,000			117.00	12,000	117.00	1
Total Raw material cost	40.50	10,800	117.00	12,000	157.50	
Other variable cost (117/6,000 x 3,750)	73.13	19,500			⎤	1
Other variable cost (144/7,500 x 9,750)	—	—	187.20	19,200 ⎦	260.33	1
Total variable cost	113.63	30,300	304.20	31,200	417.83	
Fixed cost	75.00	20,000	90.00	9,230	165.00	1
Total cost	**188.63**	50,300	**394.20**	40,430	**582.83**	
OR	1 +	1 +	1 +	1 +	1	= 5
Net cost saving (587.55 – 582.83)					4.72	1

THE END