The Institute of Finance Management

Accounting and Finance Department

Tutorial Questions

Decision-making Under the Condition of Certainty

BACC 3 and BAIT 3

Instructor: Dr Zawadi Ally

QUESTION 1

ABC co. makes electrically driven disability scooters aimed at elderly and/or disabled customers. At present wheels and tyres are bought from external suppliers but all other parts are manufactured in-house. The scooters have a strong reputation due mainly to innovative designs, special power units that can be recharged at home and seats that enable easy access for a wide range of disabilities. ABC co. also sells power units to other firms. Current monthly costs are as follows

	Seating Department Shs	Power unit Department shs
Costs		
Direct materials	9,300	4,140
Direct labour	12,600	9,450
Apportioned overheads	26,700	17,200
	48,600	30,790
Production level	60 units	90 units

Note: The power unit department currently produces 90 units a month – 60 being used in Access' own scooters, and 30 being sold externally at shs 376 each. A new order has been won to supply an additional 10 scooters per month. However, the directors are considering how best to meet the additional demand:

- Sufficient capacity exists for the company to increase its monthly production to 70 scooters, except that making an extra 10 seating assemblies would require reallocation of labour and other resources from the power unit to the seating department. This would cut power unit output by 20 units per month.
- The alternative course would be to buy 10 seating assemblies from an outside supplier and fit the 10 power units from the present production of 90 units. The cheapest quote for seating assemblies is shs 610 per assembly.

REQUIRED:

(a) Based on the figures given, show whether ABC should make or buy the extra seats.

(b) Discuss what other factors should be considered before a final decision is taken to make or to buy the extra seats**.**

(c) Comment on the relevance of the apportioned overhead cost figures to your recommendation

QUESTION 2

BM manufactures three garden furniture products – chairs, benches and tables. The budgeted unit cost and resource requirements of each of these items are detailed below:

	Chair	Bench	Table
	Shs	Shs	Shs
Timber cost	5.00	15.00	10.00
Direct labour cost	4.00	10.00	8.00
Variable overhead cost	3.00	7.50	6.00
Fixed overhead cost	4.50	11.25	9.00
	16.50	43.75	33.00
Budgeted volumes per annum	4,000	2,000	1,500

- These volumes are believed to equal the market demand for these products.
- Fixed overhead costs are attributed to the three products based on direct labour hours.
- The labour rate is Shs 4.00 per hour.
- The cost of the timber is Shs 2.00 per square metre.

The products are made from specialist timber. A memo from the purchasing manager advises you that because of a problem with the supplier, it is to be assumed that this specialist timber is limited in supply to 20,000 square metres per annum.

The sales director has already accepted an order for 500 chairs, 100 benches and 150 tables which if not supplied would incur a financial penalty of Shs 2,000. These quantities are included in the market demand estimates above.

The selling prices of the three products are:

Chair Shs 20.00
Bench Shs 50.00
Table Shs 40.00

REQUIRED:

(a) Determine the optimum production plan and state the net profit that this should yield per annum.

(b) Calculate and explain the maximum price which should be paid per square metre in order to obtain extra supplies of the timber.

QUESTION 3

Bunge Manufacturing Company manufactures agricultural equipment and currently is preparing its budget for the year 2002/3. An initial review clearly shows that the company will not be able to manufacture all the requirements for components XA, XB, XC and XD because of limited pressing capacity of 20,000 hours

The production manager has advised the company management to choose between the alternative courses of action given below to obtain the components in excess of the normal production capacity.

(i) To buy entirely from outside suppliers

(ii) To buy from outside suppliers and or use a partial second-shift

The data below are for the year 2002/2003

Standard production Cost per unit

Components	**XA**	**XB**	**XC**	**XD**
Variable costs	shs	shs	shs	shs
Direct Materials	740	540	500	880
Direct Labour	200	160	440	800
Direct Expenses	200	400	200	1,200
Fixed costs	100	80	220	400
Total production costs	**1,240**	**1,180**	**1,360**	**3,280**
Requirements in units	2,000	3,500	1,500	2,800

Direct expenses relate to the use of the mental presses, which cost shs 200 per machine hour to operate. Fixed overhead is absorbed as a percentage of direct labour cost.

Quotations obtained by the purchasing department from outside suppliers indicate a willingness to manufacture all or any part of the total requirements at the following prices each delivered to the factory

Component	**shs**
XA	1,200
XB	1,180
XC	1,040
XD	3,360

Second shift operations would increase direct labour cost by 25% over the normal shift and fixed overhead for shs 10,000 for each 1,000 units (or part thereof) for the second shift hours worked.

As a Management Account, using the information given above with supporting calculations state

(a) Which components and in what quantities should be manufactured in the 20,000 hours of the press time available

(b) Whether it would be profitable to make any the balance of the components require on the second shift instead of buying them from outside suppliers

QUESTION 4

Bunge Spinning Mill has two production departments; Machining and Assembly. The Machining department has a monthly capacity of 1,500 machine hours and the Assembly department has a monthly capacity of 3,000 direct labour hours. The production capacity of either can be expanded within a period of 15 months.

At present the company makes 3 products all of which use the same machining and assembly facilities. The expected demand, unit selling price, variable costs and the time that each unit takes in machining and assembly are provided below: -

Product	**A**	**B**	**C**
Unit Selling Price	1000	2,000	2,500
Variable Cost	400	1,200	1,240
Machine time	2 hrs	4 hrs	6 hrs
Assembly time	3 hrs	6 hrs	8 hrs
Monthly demand	200 units	200 units	100 units

The company has fixed overheads of shs 200,000 per month.

REQUIRED:

(a) Calculate the mix of production and sales which will maximize profits within the constraints under which the company operates. Calculate the profit at this mix. State all the assumptions which you have made in your calculations.

(b) Mr. Janga, the Managing Director has asked you as to which is the most profitable product. Write a memo to him responding to his question.

(c) The Marketing Director has suggested that if a further shs15,000 is spent on advertising product A, the sales could be increased to 300 units per month without any reduction in selling price. Is the additional advertising worthwhile if the company is already short of production capacity? State all your assumptions.

QUESTION 5

Majengo Company can produce three products from main raw material called BM from same labour, though different amounts are required for each product. The source of raw material is mining area near the company area and because of the nature of mining operations in that area, the company will be able to purchase only 10,000 kgs of BM monthly (all other resources will be fully available)

Management has hired you as a consultant to revise its plan for June 2015 to ensure that profits are maximised for that month.

The standard resource requirements costs and selling prices and the customer demand for delivery in June 2015 (including those orders already accepted) for each of the three products are as follows;

			Products
Resources per unit:	Product XA	Product XB	Product XC
Material BM	10 kgs	8 kgs	5 kgs
Direct labour	8 hours	9 hours	6 hours
Selling price and cost (shs per unit)			
Selling price	14,500	13,400	9,900
Material BM	2,500	2,000	1,250
Other materials	1,000	400	850
Direct labour	4,000	4,500	3,000
Overheads:			
Variable	1,000	1,125	750
Fixed (based on budgeted cost of shs 9.5m Per month)	2,400	3,000	1,200
	10,900	11,025	7,050
Customer demand (units)	1,100	950	1,450

The company has already accepted customer orders for delivery in June 2015 as follows

Product XA 34 units
Product XB 75 units
Product XC 97 units

Given the shortage of material BM, the management team has now set the following stock levels for June 2015

Material BM	
Opening stock	621 kgs
Closing stock	225 kgs

Products (units)	XA	XB	XC
Opening stock	29	33	46
Closing stock	19	25	20

REQUIRED

Prepare a production plan for December that clearly shows the number of units of each product that should be produced to maximize the profit of the Company.

QUESTION 6

The Dar es Salaam Lamp Factory produces a student reading table lamp Annual production is 10,000 lamps. Currently, sales are 8,000 lamps per year. Per unit cost and revenue data are as follows:-

Price		shs2,400
Cost		
Materials	900	
Labour	300	
Variable Overhead	300	
Fixed Overhead	300	
Sales Commissions	240	
		2,040
Profit per unit		shs360

Variable overhead varies directly with direct labour hours and overhead rate equals the labour rate. Fixed overhead is applied at the rate of 100% of direct labour costs and sales commissions are 10% of the selling price. There is no sales commission s for special orders.

REQUIRED:

Treat each question below independently.

(a) Suppose Dar es Salaam Lamp Factory receives a special order for 1,000 lamps from a new customer. This would not affect current sales. Compute the minimum price the factory should accept for this special order.

(b) Suppose Dar es Salaam Lamps Factory receives a special order for 3,000 lamps from a new customer. If the order is accepted, it must be filled. Compute the minimum price the company should accept.

(c) Suppose that current excess capacity is used to repair lamps. The repair business generates a total contribution margin of shs 300,000. It is estimated that the existence of the repair business increases sales of lamps by 2,000 units per year. If production exceeds 8,000 units, the repair business must be discontinued. How, if at all, would this affect your answers to part (a) and (b) above?

QUESTION 7

A company is preparing its production budget for the year ahead. Two of its processes are concerned with the manufacture of three components which are used in several of the company's products. Capacity (machine hours) in each of these two processes is limited to 2,000 hours. Production costs are as follows:-

	Component X shs per unit	Component Y shs per unit	Component Z shs per unit
Direct materials	15.00	18.50	4.50
Direct labour	12.00	12.50	8.00
Variable overhead	6.00	6.25	4.00
Fixed overhead			
Process M	6.00	6.00	4.50
Process N	10.50	10.50	3.50
	49.50	53.50	24.50

Requirements for component X, Y and Z for the following year are:-

Component X	300 units
Component Y	300 units
Component Z	450 units

Fixed overhead is absorbed on the basis of machine hours, at the following rates:-

Process M	shs3.00 per hour
Process N	shs3.50 per hour

Component X and Z could be obtained from an outside supplier at the following prices:

Component X	shs44.00 per unit
Component Z	shs23.00 per unit

REQUIRED:

(a) Demonstrate that insufficient capacity is available to produce the requirements for Component X, Y and Z in the year ahead and calculate the extent of the shortfall.

(b) Determine the requirements for bought-in components in order to satisfy the demand for components at minimum cost.

(c) Consider briefly any other factors which may be relevant to decisions regarding these components in the longer term.

QUESTION 8

APP Ltd is one of the most thriving manufacturing companies which have sprung up as a result of the trade liberalization policy in Tanzania. The Company produces a range of products and absorbs production overhead using a rate of 200% on direct wages. This rate was calculated from the following budgeted figures:-

Variable production costs	-	shs 64,000,000
Fixed production costs	-	shs 96,000,000
Direct labour costs	-	shs 80,000,000

The normal selling price of product X which is one of APP Ltd's product lines is shs22,000, and with a production cost of 1 unit is as follows:-

Raw Material	-	shs 8,000

Direct Labour	-	4,000
Production Overhead	-	8,000
		20,000

There is a possibility of supplying a special order of 2,000 units of product X at shs16,000 per unit. If the order is accepted, the normal budgeted sales would not be affected and the Company has the necessary capacity to produce the additional units.

You are further informed that the cost of making component Q, which forms part of product Y is stated below:-

		shs
Raw Material	-	4,000
Direct Labour	-	8,000
Production Overhead	-	16,000
		28,000

Component Q could be bought from an outside supplier for shs 20,000.

REQUIRED:

Assuming that fixed production cost will not change:-

(a) State whether the Company should:-
   (i) Accept the special order of 2,000 units of product X
   (ii) Continue making component Q or buy it from outside.
   Both your statements must be supported by detailed cost analysis.

(b) Comment on the principle you have followed in your cost analysis to arrive at your answers to (i) and (ii) above.

QUESTION 9

Majengo Packaging Company specializes in the manufacturing of one litre plastic bottles. The company's customers include dairy processors fruit juice manufacturers and manufacturers of edible oils.

The bottles are produced by a process called blow moulding. A machine heats plastic to the melting point. A bubble molten plastic is formed inside a mould, and a jet of hot air is forced into the bubble. This blows the plastic into the shape of mould. The machine releases the moulded bottle, an employee trims off any flashing (excess plastic around the edge), and the bottle is complete.

The Company has four moulding machines, each capable of producing 100 bottles per hour. The company estimates that the variable cost of producing a plastic is shs 200. The bottles are sold for shs 500 each.

Toy Company would like the company to produce a moulded plastic toy for them, has approached management. The Toy Company is willing to pay shs 3,000 per unit for the toy. The variable cost to manufacture the toy will be shs 2,400. In addition, Majengo Packaging Company would have to incur a cost of shs 20 million to construct the needed mould exclusively for this order.

Since the toy will use more plastic and is of a more intricate shape than a bottle, a moulding machine can produce only 40 units per hour. The customer wants 100,000 units. Assume that Majengo Packaging Company has a total capacity of 10,000 machine hours available during the period in which the toy company wants the delivery of toys.

The Company's fixed costs, excluding the costs to construct the toy mould, during the same period will be shs. 200 million

REQUIRED

(a) If the management predicts that the demand for its bottles will require the use of 7,500 machine hours or less during the period, should the special order be accepted? give reasons

(b) If the management predicts that the demand for its bottles will be higher than its ability to produce the bottles, should the order be accepted? Why?