P1 CIMA Workbook Q

Lecture 1
Traditional Costing

Illustration 1

Mage Co. produces a product with the following Budgeted information for the year:

Item	Cost	Usage
Direct Materials	$6 per kg	2.5 kg per unit
Direct Labour	$15 per hour	3 hrs per unit
Variable Overheads	$8 per hour of direct labour	
Fixed Overheads	$500,000 (Absorbed per unit of production)	50,000 units budgeted production & sales

In the year production actually turned out to be 45,000 with 40,000 actually sold.

There was no opening stock.

Produce a standard cost card using absorption costing and value the company's closing stock.

Illustration 2

Mage Co. produces 3 products with the following information:

Item	A	B	C
Direct Materials Per Unit (kg)	2	1.5	3
Direct Labour Per Unit (Hrs)	4	2	4
Budgeted Machine Hours Per unit	0.75	1.2	1
Sales Price	45	35	32
Budgeted & Actual Production/Sales	50,000	20,000	66,000

Direct Materials cost $5 per kg and Direct Labour is $8 per hour. The total budgeted overhead was $500,000 and was to be absorbed on the basis of machine hours.

Calculate the full cost per unit and the profit. What implications does this have for the business?

Illustration 3

Mage Co. absorbs overheads on the basis of labour hours and has the following information available:

Item	Budgeted	Actual
Fixed Production Overhead	$450,000	$475,000
Output	50,000	60,000
Labour Hours	900,000	930,000

Calculate the under or over absorption of overheads in the year.

Illustration 4

Mage Co. produces a product with the following information:

Item	Cost	Usage
Direct Materials	$6 per kg	2.5 kg per unit
Direct Labour	$15 per hour	3 hrs per unit
Variable Overheads	$8 per hour of direct labour	
Fixed Overheads	$500,000 (Absorbed per unit of production)	50,000 units budgeted production & sales

In the year production actually turned out to be 45,000 with 40,000 actually sold.

There was no opening stock.

Produce a standard cost card using marginal costing and value the company's closing stock.

Illustration 5

Mage Co. produces a product with the following information:

Selling Price	$50 p/unit
Direct Material	$15 p/unit
Direct Labour	$10 p/unit
Variable Overhead	$5 p/unit
Fixed Costs	$5,000
Budgeted & Actual output & Sales	1,000 units

(i) Calculate the profit for the period using absorption costing.

(ii) Calculate the profit for the period using marginal costing.

Illustration 6

Mage Co. produces a product with the following information:

Selling Price	$60 p/unit
Direct Material	$15 p/unit
Direct Labour	$10 p/unit
Variable Overhead	$5 p/unit
Fixed Costs	$7,500
Budgeted Output & Sales	1,000 units
Actual Output	1,000 units
Actual Sales	900
Marginal Costing Value of Opening Stock of 200 units	$6,000
Absorption Costing Value of Opening Stock of 200 units	$7,500

(i) Calculate the profit for the period using absorption costing.

(ii) Calculate the profit for the period using marginal costing.

(iii) Reconcile the profit under (i) with that under (ii)

Illustration 7

Mage Co. produces a product with the following information:

Selling Price	$15
Direct Material	$3.5 p/unit
Direct Labour	$4 p/unit
Variable Overhead	$2 p/unit
Fixed Costs	$60,000 per annum
Budgeted Output	30,000 units per annum

In month 1 actual production was 2400 which exceeded sales by 180 units.

Calculate the profit under absorption costing

Objective Test Questions

OTQ1

A manufacturing company recorded the following costs in March for Product M:

Direct Materials	18,000
Direct Labour	4,700
Production Overhead	20,400
Non- Production Overhead	18,200
Total Costs	61,300

During March 2,000 units of Product M were produced but only 1,700 units were sold. At the beginning of March there was no inventory.

The value of the inventory of Product M at the end of March using marginal costing was:

A $2,805

B $3,405

C $2,900

D $3,100

OTQ2

A business manufactures a single product which it sells for $60. The budgeted data are as follows:

Production and sales volume	1,500 units
Material Costs	10,250
Direct Labour Cost	7,800
Production Overhead	30,250
Non-Production Overhead	21,500

Actual production volume and costs were as budgeted but the actual sales volume achieved was 1,300 units. There was no inventory at the beginning of the period.

What is the profit for the period using Marginal costing?

OTQ3

	June	July
Marginal Costing Profit/(Loss)	29,750	(3,250)
Production (units)	3,000	4,500
Sales (Units)	2,700	4,100

Fixed Production Overhead €6 per unit

Using reconciliation, what is the Absorption Costing profit for June and July?

A June $31500 ; July ($850)

B June $27950 ; July ($5650)

C June $23240 ; July ($5850)

D June $27950 ; July ($8240)

OTQ4

Using full cost pricing, what is the selling price of the following product?

Direct Material $18

Direct Labour $12

Variable Production Overhead $15

Fixed Production Overhead $20

Mark up 20%

A $81.25

B $54

C $75.25

D $78

OTQ5

Using the information from OTQ4, what is the selling price of the production using Marginal cost plus pricing?

A $84.50

B $54

C $95.25

D $78

OTQ6

Which of the following is an example of a fixed cost?

A. Rent

B. Direct Material

C. Electricity

D. Postage

OTQ7

A manufacturing company recorded the following costs in March for Product M:

Direct Materials	18,000
Direct Labour	4,700
Variable Production Overhead	3,200
Fixed Production Overhead	17,200
Variable Selling Costs	3,700
Fixed Distribution Costs	14,500
Total Costs	61,300

During March 3,000 units of Product M were produced but only 1,700 units were sold. At the beginning of March there was no inventory.

The value of the inventory of Product M at the end of March using absorption costing was:

A $28,015

B $21,050

C $29,000

D $31,000

OTQ8

A business manufactures a single product which it sells for $60. The budgeted data are as follows:

Production and sales volume	1,500 units
Material Costs	10,250
Direct Labour Cost	7,800
Production Overhead	30,250
Non-Production Overhead	21,500

Actual production volume and costs were as budgeted but the actual sales volume achieved was 1,300 units. There was no inventory at the beginning of the period.

What is the profit for the period using absorption costing?

OTQ 9

An organisation uses absorption costing. The budgeted fixed production overheads for the company for the latest year were $300,000 and the budgeted output was 200,000 units. At the end of the company's financial year the total of the fixed production overheads was $210,000 and the actual output achieved was 150,000 units.

The under/over absorption over overheads was

A $90,000 over absorbed

B $90,000 under absorbed

C $15,000 over absorbed

D $15,000 under absorbed

OTQ 10

Which of the following is an advantage of using Absorption Costing?

A. It recognizes the importance of fixed costs in production

B. The cost volume profit relationship is ignored. Managers use intuition to make the decision

C. Absorption costing can artificially inflate your profit figures in any given accounting period.

D. Absorption costing consists of expenses that do not change with your level of production.

Lecture 3
Activity Based Costing

Illustration 1

	%
Costs relating to set-ups	35
Costs relating to materials handling	15
Costs relating to inspection	50
Total production overhead	100

The following total activity volumes are associated with each product line for the period as a whole:

	No. of Set ups	No. of movement of materials	No. of Inspections
Product D	75	12	150
Product C	115	21	180
Product P	480	87	670
	670	120	1,000

Required:

Identify the cost drivers for each of the cost categories above.

Illustration 2

Total Overheads	100,000
Costs relating to set ups	50%
Costs relating to inspections	50%
Number of Set ups	100
Number of Inspections	50

Required

Calculate the Cost per Driver.

Illustration 3

To produce product A takes the following:

Number of set ups	20
Number of inspections	2

Using the cost per driver in the previous example, what are the total overheads applicable to product A?

Illustration 4

Company A has the following information applicable to its products:

Total Overheads = 100,000

Total machine Hours = 50,000

Product	A	B
Units of Production	2,500	5,000
Material Cost p/unit	30	50
Labour Cost per unit	20	16
Machine Hrs P/unit	10	5

	% Overheads
Set up Costs	35
Inspections	45
Materials Handling	20

	A	B	Total
Set ups	300	50	350
Inspections	500	250	750
Goods Movements	300	700	1000

What is the Cost per unit of A and B

(1) Under Traditional Absorption Costing.

(2) Under ABC.

Objective Test Questions

OTQ1

Identify the cost drivers to the following cost categories

Categories
1. Marketing
2. Client Meetings
3. Data Input
4. Analysis & Research
5. Training & Development

Cost Driver
A. No. of Clients
B. Research Hours
C. No. of Staff
D. Computer hours
E. No. of client lunches

A 1E 2C 3B 4A 5D

B 1B 2E 3C 4D 5A

C 1A 2B 3C 4D 5E

D 1E 2A 3D 4B 5C

OTQ2

Total Overheads	250,000
Inspection costs	25%
Client Meeting costs	75%
No. of Inspections	40
No. of Clients	70

What is the cost per driver of Inspections?

A 162.50

B 2507.25

C 3500

D 1562.50

OTQ3

To produce Product X, it takes 15 inspections.

Using the information provided in OTQ2, what are the total overheads applicable to product X?

A 23,437.50

B 31,250

C 45,785

D 15,000

OTQ4

Which of the following is an advantage of ABC?

1 Better cost control

2 Fairer allocation of costs

3 Can be used in complex situations

4 More accuracy

A 1, 2 & 4

B All of the above

C 2 & 4

D 1 & 3

OTQ 5

Which of the following is a disadvantage of ABC?

1 Not always relevant

2 Need to choose appropriate drivers and activities

3 complex

4 inexpensive

A 1, 2 & 3

B All of the above

C 2 & 4

D 1 & 3

Test Your Knowledge

If you can't answer all of the questions below without looking at the answer then you need to do some more work on this area!

1. What does ABC costing link costs to?

2. Why do differences in modern production techniques mean that ABC is useful?

3. How do you calculate the cost per driver?

4. What type of cost is ABC used to allocate?

5. What can absorption costing lead to and why?

6. Give 3 advantages of ABC over absorption costing.

7. Why might the price of a product change under ABC costing?

8. Give 3 problems with ABC costing.

Lecture 4 Environmental Accounting

Test Your Knowledge

If you can't answer all of the questions below without looking at the answer then you need to do some more work on this area!

1. What is environmental costing?

2. What are the 2 categories of environmental cost?

3. Give 3 examples of costs in each of the categories.

4. Who are external environmental costs imposed upon?

5. Are these costs recognised in traditional methods of costing?

6. Name 3 methods of environmental costing.

7. What are the advantages of environmental costing?

8. What are the disadvantages of environmental costing?

Lecture 5 Throughput Accounting

Illustration 1

No. Units Sold Per Day	500
Sales Price	£25
Direct Materials Cost per unit	£10
Other Factory Costs per Day	£6000
No. Hours of bottleneck used per day	8

Required

(i) *Calculate the Return Per Factory Hour.*
(ii) *Calculate the Throughput Accounting Ratio.*
(iii) *Suggest how could the ratio be improved.*

Illustration 2

Solar Systems Co (S Co) makes two types of solar panels at its manufacturing plant: large panels for commercial customers and small panels for domestic customers. All panels are produced using the same materials, machinery and a skilled labour force. Production takes place for five days per week, from 7 am until 8 pm (13 hours), 50 weeks of the year. Each panel has to be cut, moulded and then assembled using a cutting machine (Machine C), a moulding machine (Machine M) and an assembly machine (Machine A).

As part of a government scheme to increase renewable energy sources, S Co has guaranteed not to increase the price of small or large panels for the next three years. It has also agreed to supply a minimum of 1,000 small panels each year to domestic customers for this three-year period.

Due to poor productivity levels, late orders and declining profits over recent years, the finance director has suggested the introduction of throughput accounting within the organisation, together with a 'Just in Time' system of production. Material costs and selling prices for each type of panel are shown below.

	Large panels	Small panels
	$	$
Selling price per unit	12,600	3,800
Material costs per unit	4,300	1,160

Total factory costs, which include the cost of labour and all factory overheads, are $12 million each year at the plant.

Out of the 13 hours available for production each day, workers take a one hour lunch break. For the remaining 12 hours, Machine C is utilised 85% of the time and Machines M and A are utilised 90% of the time. The unproductive time arises either as a result of routine maintenance or because of staff absenteeism, as each machine needs to be manned by skilled workers in order for the machine to run. The skilled workers are currently only trained to work on one type of machine each. Maintenance work is carried out by external contractors who provide a round the clock service (that is, they are available 24 hours a day, seven days a week), should it be required.

The following information is available for Machine M, which has been identified as the bottleneck resource:

	Large panels	Small panels
	Hours per unit	Hours per unit
Machine M	1·4	0·6

There is currently plenty of spare capacity on Machines C and A. Maximum annual demand for large panels and small panels is 1,800 units and 1,700 units respectively.

Required:

Calculate the throughput accounting ratio for large panels and for small panels and explain what they indicate to S Co about production of large and small panels.

Objective Test Questions

OTQ1

Which of the following is a benefit of JIT (Just In Time)

1. Better quality
2. Less storage needed
3. Fewer bottlenecks
4. Initial set up costs

A. 1, 2 & 3

B. All of the above

C. 3&4

D. 2&4

OTQ2

The following information relates to the single product made by NY Ltd.

Selling price per unit	$21
Direct material cost per unit	$12
Max. demand (units) per period	10,000
Time required (hours) in Process A, per unit	0.5
Time required (hours) in Process B, per unit	1.5

The capacities are 45,000 hours in Process A and 33,000 hours in process Y

The total factory costs are $150,000 in the period.

Identify the bottleneck process

A Process A

B Process B

OTQ3

Using the information given in OT2, calculated the throughput contribution

A 6

B 9

C 8

D 3

OTQ4

Using the information given in OTQ2, calculate the throughput accounting ratio.

A 3.40

B 2.10

C 1.20

D 1.50

OTQ5

Which of the following would you do to improve throughput accounting ratio?

A Increase selling price

B Increase material costs

C Increase fixed costs

D Increase labour costs

Test Your Knowledge

If you can't answer all of the questions below without looking at the answer then you need to do some more work on this area!

1. What type of manufacturing environment is Throughput Accounting suitable for?

2. Why is producing goods for inventory seen as bad?

3. What is the 'theory of constraints'?

4. How do we calculate throughput contribution?

5. What are the 4 concepts behind Throughput Accounting?

6. What is the 'return per factory hour'?

7. How do you calculate the Throughput Accounting Ratio?

8. What does it tell you?

9. How can you improve it?

10. State 3 other factors should be considered before ceasing production based on the THAR.

Lecture 6
Modern Techniques

Objective Test Questions

OTQ 1

Which of the following is a characteristic of a modern manufacturing environment

1. Global Environment
2. Greater focus on cost reduction
3. Better customer focus
4. Less employee participation

A 1,3 & 4

B 2 & 4

C 1, 2 & 3

D All of the above

OTQ 2

What does OPT stand for?

A Optimal Process Techniques

B Other Product Target

C Optimized Prevention Technique

D Optimized Production Technology

OTQ 3

Which three of the following are the principles of TQM (Total Quality Management)

1 Right Time first

2 Materials Requirements Planning

3 Continuous Improvement

4 Customer Focus

A 1,2 & 3

B 2, 3 & 4

C 1, 2 & 4

D 1, 3 & 4

OTQ4

Which of the following is a cost of quality?

1. Prevention Costs
2. Appraisal Costs
3. Internal failure costs
4. External failure costs

A 1,2 & 3

B 2, 3 & 4

C All of the above

D 1, 3 & 4

OTQ 5

Which of the following is a requirement of a pull system?

1. High Quality
2. Flexibity
3. Less speed
4. High Costs

A 1 & 2

B All of the above

C 3 & 4

D 1, 2 & 3

OTQ 6

Which of the following is a disadvantage of a JIT (Just In Time) System?

A. Initial Set up Costs
B. Less storage
C. Better Quality
D. Flexibility

Lecture 7
Cost/Volume/Profit Analysis

Illustration 1

Mage Co. produces a product with the following information for next month:

	$
Variable Cost	40
Fixed Costs	$20,000
Budgeted Production	1,000

(i) Calculate the full cost per unit.
(ii) With the recent recession, the firm is experiencing a slowdown in demand and the only offer they have for their product is a company who will buy all 1,000 units at $57 per unit. Mage are confident that demand will pick up in the next few months. Should they accept the offer?

Illustration 2

Company A is producing a product with the following information:

	$
Sales Price	50
Variable Cost	30
Fixed Costs	$40,000
Budgeted Production	6,000

Required:

(i) Calculate the following using ratios rather than the chart:
- Contribution to sales ratio.
- Break even point in units.
- Break even point in revenue.
- How many units need to be sold to achieve a profit of $50,000
- How much revenue is required to achieve a profit of $50,000.
- The margin of safety.

Objective Test Questions

OTQ1

Selling Price	$30
Variable Costs	$12
Fixed Costs	$520,000
Budgeted Production	40,000 units

Calculate Contribution?

A $18

B $17

C $5

D $0

OTQ2

Using the information in OTQ1, how many units need to be sold to achieve a profit of $200,000?

A 5,500

B 30,000

C 40,000

D 70,000

OTQ3

Using the information in OTQ1, how much revenue is required to achieve a profit of $200,000?

A 1,200,000

B 1,230,000

C 2,540,000

D 700,000

OTQ4

Using the information in OTQ1, what is the break even point in units?

A 40,000

B 28,888

C 53,000

D 7,000

OTQ 5

In a situation where a company sells more than one product, how do you rank the products?

A By Contribution

B By variable costs

C By Profit

D By quality

Test Your Knowledge

If you can't answer all of the questions below without looking at the answer then you need to do some more work on this area!

1. How is contribution calculated?

2. Complete the statement 'Contribution to.....'

3. Company A is producing a product with the following information:

	$
Sales Price	75
Variable Cost	40
Fixed Costs	$75,000
Budgeted Production	8,000

Required:

(i) Calculate the following using ratios:

- **Contribution to sales ratio.**
- **Break even point in units.**
- **Break even point in revenue.**
- **How many units need to be sold to achieve a profit of $50,000**
- **How much revenue is required to achieve a profit of $50,000.**
- **The margin of safety.**

4. Company B is producing 2 products with the following details being relevant:

	Product X	**Product Y**
Sales Price	40	75
Variable Cost	20	52
Contribution Per Unit	20	23
Budgeted Sales	50,000	120,000
Total Fixed Costs are $500,000		

Required:

(i) Calculate the break even point in sales revenue for company B
(ii)Calculate the sales revenue required to make a profit of $250,000.

5. ABC produces 3 products A,B & C with the following data available:

	A	B	C
Selling Price	40	45	90
Variable Cost	35	37	75
% of Total Sales	30	50	20

Fixed Costs in the period are expected to be $500,000

Budgeted sales are 200,000 units

Required

(i) Calculate the sales revenue required to break even

(ii) Calculate the sales revenue required to make $400,000 profit

(iii)Show the points to plot on a Profit-Volume chart using the data in the question assuming the company decides to sell the most profitable product first.

Lecture 8
Relevant Costing

Illustration 1

ABC Co. is considering a project to produce a one-off run of products for a customer. They can employ non-skilled staff at short notice who are paid $8 per hour and are not currently needed elsewhere in the business. The production run will also use skilled labour who are currently employed on another project which creates contribution of $35 per hour for the business. The skilled labour are paid $20 per hour.

The production run will take:

500 hours of unskilled labour.
200 hours of skilled labour.

(i) What is the relevant cost of labour for inclusion in the evaluation of the project by ABC?
(ii) If the unskilled labour was employed by ABC on contract guaranteeing them work for the 500 hours in any area of the factory then what would the labour cost be?

Illustration 2

Laddy Co. is considering undertaking a one-off building project.

The project will use 2 different types of window, standard and decorative.

Standard windows currently cost $40 each and the project will require 20,000 of these.
Decorative brick currently costs $120 each and the project will require 2,000 of these.

Laddy has 7,000 standard windows in stock which cost $30 when they were purchased 3 months ago. These are used in all projects undertaken by Laddy and there are 3 other projects in progress at the moment.

Laddy has 300 decorative windows in stock which cost $150 when they were purchased. They do not expect to use the decorative type on future projects and could sell any that they have for their current cost price less 10% as some are damaged.

What is the total relevant cost of the windows for consideration of the project?

Illustration 3

A builder has been asked to quote for a job and has the following information available about the costs:

Item	Detail	$	
Direct Materials			
Bricks	200,000 at $100 per thousand.	20,000	Note 1
	200,000 at $120 per thousand.	24,000	
Other Materials		5,000	Note 2
Direct Labour			
Skilled	3,200 hrs at $12 per hour	38,400	Note 3
Unskilled	2,000 hrs at $6 per hour	12,000	Note 4
Other Costs			
Scaffolding hire		3,500	Note 5
Depreciation of general purpose machinery		2,000	Note 6
General overheads	5,200 hrs at $1 per hour	5,200	Note 7
Plans		2,000	Note 8
Total Cost		112,100	
Profit		22,420	Note 9
Suggested Price		134,520	

Notes:

1. The contract requires 400,000 bricks of this standard type. The builder has 200,000 already in stock and will need to buy 200,000. The 200,000 at $100 per 1,000 in the quote above were bought at that price earlier in the year. The current replacement cost for this type of brick is $120 per 1,000. If the bricks are not used on this project the builder is confident that he will be able to use them later on in the year.

2. This is the purchase price of other materials that will be bought in as required.

3. The builder intends to work 800 hours of the skilled work himself and hire the rest in on an hourly basis at $12 per hour. If the builder does not take on this job he can either work for other builders at $12 per hour or complete urgently required work to his own house for which he has been quoted $12,000 by another builder.

4. The builder has 4 unskilled labourers employed on a contract guaranteeing them 40 hours per week at $6 per hour. They are currently idle and have spare time available to complete the job.

5. This is the estimated cost of hiring scaffolding.

6. The job will take 20 weeks and the machine will not be used on any other job if this job is not taken on.

7. This represents the cost of the storage yard used by the builder. If this is not used it can be rented out to a competitor for the 20 week period at a rent of $500 per week.

8. This is the cost of drawing up the plans for the project. These were drawn up several weeks ago.

9. A mark up of 20% is added to all jobs.

Required:

(i) Explain how each item described above should be treated.
(ii) Using relevant costing principles, calculate the lowest price that the builder could quote for the building work.

20 Marks

Illustration 4

Archie Co. produces 2 products, A and B with the following information available:

	A	B
Production (units)	1,000	2,000
Direct Material Cost Per unit	4	5
Direct Labour Cost Per unit	8	9
Direct Overhead Cost Per unit	2	3
Fixed cost per unit	4	6
Sales Price per unit	$19	$25

Another supplier has offered to supply A at a price of $12 and B for $21.

Should Archie make or buy in the components?

Illustration 5

Alder Co. produces 3 components with the following information available:

	A	B	C
Production (units)	20,000	40,000	80,000
Direct Material Cost Per unit	0.80	1.00	0.40
Direct Labour Cost Per unit	1.60	1.80	0.80
Direct Overhead Cost Per unit	0.40	0.60	0.20
Fixed cost per unit	0.80	1.00	0.40
Sales Price per unit	4.00	5.00	2.00
Imported Price	2.75	4.20	2.00

Required:

(i)Should Alder Co. make or buy each of the components it sells?
(ii)If the components are all made by Alder Co. how much profit will be made?
(iii)If your recommendation in part (i) is taken up how much profit will be made?
(iv)What other factors should be considered before this decision is made?

Objective Test Questions

OTQ1

In relevant costing, when costing plant, which of the following is included?

1 Depreciation

2 Hire Costs

3 Sunk Cost

4 Installation Costs

A 1, 2 & 3

B 2 & 4

C 1,2 & 4

D All of the above

OTQ2

The following cost is not a relevant cost;

The salary to be paid to an engineering supervisor who will oversee the production of a new product. This role will be created specifically for this new product and the $50,000 salary will be a fixed cost. This cost will not be included in the cost of the project.

A True

B False

OTQ3

Product X requires 500Kg of Material G. 300Kg of this material is currently in stock, this was purchased at a cost of $2 per Kg, it could be sold for $2.75 per Kg and current purchase price is $4 per Kg. At the moment, the company will not be using the material in any other product. What is the relevant cost of Material G?

A 1,625

B 1,400

C 1,325

D 1,500

OTQ4

ABC Co manufactures product H. The following relates to product H.

Selling Price 90

Requirement per unit

Labour : 2 hours @ $12 per hour

Material X : 1.5 litres @ $4.50 per litre

Material Y : 1 Kg @ $7.50 per litre

Machine hours : 10

Variable Overhead : 2.50 per labour hour

Variable Overhead : 2.50 per machine hour

Buying in Product H: $65

Should ABC Company;

A. Continue to manufacture

B. Buy in

OTQ5

Aside from the buy in option being lower that production costs of a product, which of the following non-financial factors should you consider?

1 Use of spare capacity

2 Workforce reaction

3 Reliability of the outsourcer

4 Quality considerations

A 1 & 4

B 2, 3 & 4

C 2 & 3

D All of the above

Test Your Knowledge

If you can't answer all of the questions below without looking at the answer then you need to do some more work on this area!

1. What are the 3 criteria that must be met before a cost is deemed relevant?

2. If a business is to use machinery currently owned on a new project is the cost of the machinery relevant?

3. If labour can be used elsewhere in the organisation what are the 3 elements to calculating the relevant cost of that labour?

4. If materials are in stock and are used and replaced regularly then what is their relevant cost?

5. If materials are in stock but aren't used and replaced regularly how is their relevant cost determined?

6. What other considerations other than financial need to be considered when deciding whether to make or buy in components?

Lecture 9
Decision Making

Illustration 1

ABC Ltd manufactures two components A & B. There are to be 5000 of each component manufactured next year. The following information is available for each unit of A & B.

	Machine Hrs	Variable Cost
Unit of A	4	25
Unit of B	6	34

A total of 30,000 machine hours are available.

A sub-contractor is willing supply ABC with units of A & B for $27 and $38 respectively.

Advise ABC.

Illustration 2

ABC Ltd manufactures two components A & B. There are to be 3,000 of unit A and 4,000 of unit B manufactured next year. The following information is available for each unit of A & B.

	Labour Hrs	Variable Cost
Unit of A	3	22
Unit of B	5	37

A total of 17,000 labour hours are available.

A sub-contractor is willing supply ABC with units of A & B for $25 and $40 respectively.

Advise ABC on which components should be made and calculate how many units of the other should be bought in.

Illustration 3

ABC Ltd produces two products out of a joint process - products A & B.

At split off, 100,000 units of A and 50,000 units of B are produced.

At this point A can be sold for $1.25 and B can be sold for $2.00.

ABC can further process product A to produce A+ but it will incur further set up costs of $20,000 and variable costs of $0.30 per unit introduced into the further process to do so.

60,000 units of A+ could be produced.

A+ would be sold at $3.25 per unit.

Should ABC sell product A or A+?

Illustration 4

Elco Co. has decided to close department 3 in it's operations.

You have been asked to review the decision based on the following information:

	1	2	3	Total
Sales (units)	5,000	6,000	2,000	13,000
Sales Revenue	150,000	240,000	24,000	414,000
Cost of Sales				
Direct Material	75,000	150,000	10,000	235,000
Direct Labour	25,000	30,000	8,000	63,000
Production Overhead	5,769	6,923	2,308	15,000
Gross Profit	44,231	53,077	3,692	101,000
Expenses	15,384	18,461	6,155	40,000
Net Profit	28,847	34,616	-2,463	61,000

Notes

1. The production overheads of $15,000 have been allocated to the 3 departments on the basis of sales revenue. On further investigation you realise that only 50% of these can be traced directly to these departments and can be allocated on the basis 2:2:1.
2. Expenses are head office expenses of which 60% can be traced to the departments and can be allocated on the basis 3:3:2.
3. 80% of the labour is a fixed cost and the remaining amounts would be better allocated on the basis of sales volume.

Recommend to management whether their decision to close department 3 is justified.

Objective Test Questions

OTQ1

What is the rule when dealing with a scarce resource?

A Buy in the element with the highest variable cost per unit of scarce resource

B Buy in the element with the lowest extra variable cost per unit of scarce resource

C Buy in the element with equal to the variable cost per unit of scarce resource

D Buy in the element that is the cheapest

OTQ2

Which of the following is an advantage of outsourcing?

1 Responds to fluctuations

2 Loss of control

3 Dependence on a supplier for quality

4 Focus of core competencies

A 1 & 4

B All of the above

C 2 & 3

D 4

OTQ3

A manufacturing company operates process A from which four products emerge. Each of the four products can either be sold or processed further. After further processing, each product can enter the market at a higher selling price.

Which of the following is required to determine whether the product should be processed further?

1 Total cost of process A

2 The basis of apportioning the cost of process A over the four products

3 Unit selling price of each product after processing further

4 The number of outputs from process A

A 1 & 2

B All of the above

C 3 & 4

D 1 & 4

OTQ4

What is the first step when dealing with a shut down decision?

A Evaluate current earnings/losses

B Announce to staff and prepare redundancies

C Financial consequences

D Comparison of results

Test Your Knowledge

If you can't answer all of the questions below without looking at the answer then you need to do some more work on this area!

1. How does a company decide which components to make and which to buy when resources are limited?

2. ABC Ltd manufactures two components A & B. There are to be 300 of each component manufactured next year. The following information is available for each unit of A & B.

	Machine Hrs	Variable Cost
Unit of A	5	19
Unit of B	4	22

A total of 2,000 machine hours are available.

A sub-contractor is willing supply ABC with units of A & B for $21 and $25 respectively.

Advise ABC.

3. What are the benefits of outsourcing?

4. What are the downsides of outsourcing?

5. ABC Ltd produces two products out of a joint process - products A & B.

At split off, 10,000 units of A and 7,000 units of B are produced.

At this point A can be sold for $3 and B can be sold for $2.00.

ABC can further process product A to produce A+ but it will incur further set up costs of $8,000 and variable costs of $1.30 per unit produced at the end of further processing to do so.

7,000 units of A+ could be produced.

A+ would be sold at $5 per unit.

Should ABC sell product A or A+?

6. Why might a company choose not to shut down a division which is making a loss?

Lecture 10
Linear Programming I

Illustration 1

Our Company manufactures two products, Designer Shoes and Sneakers.

The number of machine hours available for production in the month is restricted to 500.

The products require the following number of hours to produce

	Machine hrs required
Designer Shoes	5
Sneakers	2

Maximum demand in the month is 150 units made up of any mix of designer shoes and trainers.

What is the optimum level of production and the profit made at that level?

Objective Test Questions

A company produces two types of product in three areas.

	Product 1	Product 2	Hours Available
	Hrs per unit	Hrs per unit	
Area 1	16	20	22,000
Area 2	8	20	18,000
Area 3	24	12	24,000
Contribution per unit ($)	8	16	

OTQ1

Which two of the following are the variables of the question?

A X = no. of units of Product 1

B Y = no. of units of Product 2

C X = no. of hours of Product 1

D Y = no. of hours of Product 2

OTQ2

Which of the following are the constraints of the question

1 $16x + 20y \leq 22,000$

2 $8x + 20y \leq 18,000$

3 $24x + 12y \leq 24,000$

4 $x,y \geq 0$

A 1, 2 & 3

B 2 & 3

C 3 & 4

D All of the above

OTQ3

Which of the following is the objective function of the question?

A Profit = 8x + 16y

B Profit = 8x - 16y

C Profit = 8y + 16x

D Profit = 8y - 16x

OTQ4

What are the X and Y values when y=0 and x=0 with the following constraint 16x + 20y ≤ 22,000

A X = 1375 ; Y = 1100

B X = 0 ; Y =1100

C X = 1,375 ; Y = 0

D X = 1100 ; Y = 1,375

OTQ5

What are the X and Y values when y=0 and x=0 with the following constraint 8x + 20 y ≤ 18,000

A X = 0 ; Y = 900

B X = 2,250 ; Y = 900

C X = 2,250 ; Y = 0

D X = 900 ; Y = 2,250

OTQ 6

What would be the total profit if 50 units of product 1 was sold and 70 units of product 2?

A 1360

B 1920

C 120

D 1290

Test Your Knowledge

If you can't answer all of the questions below without looking at the answer then you need to do some more work on this area!

1. What sort of problems are linear programming designed to solve?

2. Give an example of a constraint that may prevent unlimited production.

3. A business has only 300 labour hours available and 400 machine hours . They produces 2 products - Digestives and Jammy Dodgers. Digestives take 3 labour hours to produce and 5 machine hours. Jammy Dodgers take 4 labour hours and 3 machine hours. Define the variables and establish the constraints.

4. If Digestives make contribution of $25 and Jammy Dodgers $37 establish the objective function.

5. Establish the points to plot the graph of the constraints established in Q3.

6. Plot the graph.

7. Draw the Iso-profit line to establish the profit maximising point.

8. Calculate the profit at that point.

Lecture 11
Linear Programming II

Illustration 1

The company producing sneakers and designer shoes in the previous illustration has calculated that a marketing campaign will increase the demand for shoes by 1 unit to 150. It is estimated that the campaign will increase overall costs by $7 per unit on average.

Should the company conduct the campaign?

Objective Test Questions

OTQ1

Two constraint lines 8x + 20y = 18,000 and x + y = 210 intersect at a point B on the graph. The objective function is Profit = 70X + 100Y, what is the profit level at point B?

A 65,000

B 71,280

C 55,500

D 39,115

OTQ 2

Which of the following best describes slack?

A Under-utilised resource

B Fully utilised resource

C Scarce resource

D Materials in inventory

Test Your Knowledge

If you can't answer all of the questions below without looking at the answer then you need to do some more work on this area!

1. Based on the details in the Test Your Knowledge questions in the previous chapter, the workforce have agreed to work overtime for twice the normal rate of $10 per hour in order to make more labour hours available. Should the company accept the offer?

Lecture 12
Standard Costing

Objective Test Questions

OTQ1

Which of the following describes a standard cost?

A Estimated cost per unit

B A variance

C Variable costs

D Fixed costs

OTQ2

An ideal standard cost is

A Attainable

B Unattainable

C Current

D Basic

OTQ3

Which of the following is a problem with a flexed budget?

A Responds to changes

B Does not respond to changes

C Stepped fixed costs

D Does not give a true budget

OTQ4

Which of the following can cause idle time?

A Lunch hour

B Machinery breakdown

C Work overload

D Restroom breaks

OTQ5

Managers are responsibility for which of the following costs

A Direct

B Indirect

C Uncontrollable

D Controllable

Test Your Knowledge

If you can't answer all of the questions below without looking at the answer then you need to do some more work on this area!

1. What is a standard cost?

2. If we compare our standard cost with the actual cost, what is the difference called?

3. What is an ideal standard cost?

4. Why should a budget be flexible?

5. Why might there be wastage of materials?

6. What is idle time and why might it occur?

7. What is the principle of controllability?

8. Who should be responsible for a cost?

Lecture 13
Simple Variances

Illustration 1

Sticky Wickets manufactures Cricket Bats. In May 2010 the budgeted sales and production were 19,000 bats and the standard cost card is as follows:

	Std Cost	Std Cost
Materials (2kg at $5/kg)	10	
Labour (3hrs at $12/hr)	36	
Overheads (3hrs at $1/hr)	3	
Marginal Cost		49
Selling Price		68
Contribution		19
Total fixed costs in the period were budgeted at $100,000 and were absorbed on the basis of labour hours worked.		

In May 2010 the following results were achieved.

40,000kg of wood were bought at a cost of $196,000, this produced 19,200 cricket bats. No inventory of raw materials is held. The labour was paid for 62,000 hours and the total cost was $694,000. Labour worked for 61,500 hours.

Variable overheads in the period were $67,000.

The sales price was reduced to protect the sales levels. However, only 18,000 cricket bats were sold at an average price of $65.

Total fixed costs in May were $107,000.

Calculate the sales, materials, labour, variable overheads, fixed overheads variances and any other appropriate variances in as much detail as possible.

Objective Test Questions

Denis the Menace Ltd had budgeted sales of 200 units at $12.50 each. Variable cost per unit was $9 and there were no fixed costs. The actual sales were 250 units at $10 each and cost were as expected.

OTQ 1

What is the sales price variance?

A 625 A

B 625 F

C 325 A

$ 325 F

OTQ2

What is the sales volume variance?

A 50 A

B 50 F

C 100 A

D 100 F

OTQ 3

James Dean Ltd manufactures product duck with the following budgeted material costs per unit;

3Kg of material X at $15/Kg

Actual Results:

Output 500 units

Material purchased and used 1,100Kg

Material cost $10,450

What is the Materials price variance?

A 2040 F

B 2040 A

C 6050 F

D 6050 A

OTQ4

What is the materials usage variance?

A 400A

B 400F

C 6000A

D 6000F

OTQ5

Ed Ran Ltd makes product f and has the following budgeted information

Budgeted Production	2000 units
Labour hours per unit	6
Labour rate per hour	$16
Actual Results	
Output	2200 units
Hours paid for and worked	6,800 hours
Labour cost	$56,600

What is the labour rate variance?

A 52200 F

B 52200 A

C 49800 F

D 49800 A

OTQ6

What is the labour efficiency variance?

A 40,800 F

B 40,800 A

C 102,400 F

D 102,400 A

OTQ7

The budgeted output for Annette Curtain Ltd for June was 1500 units of product P. Each unit requires 3 direct labour hours. Variable overheads are budgeted at $4.50 per labour hour.

Actual results:

Output	1350 units
Labour hours worked	2970 hours
Variable overheads	$8,316

What is the variable overhead rate variance?

A 5049F

B 5049A

C 4095A

D 4095F

OTQ8

What is the variable overhead efficiency variance?

A 4860 A

B 4860 F

C 1080 F

D 1080 A

The following information is available for a company for Period 6

Fixed production overheads	11,480
Units	3,280

The standard time to produce each unit is 1.5 hours

Actual

Fixed production overheads	12,100
Units	3,230
Labour hours	6,300 hours

OTQ9

What is the fixed overhead expenditure variance

A 620 F

B 620 A

C 1200 A

D 1200 F

OTQ10

What is the fixed overhead volume variance?

A 175 A

B 175 F

C 200 A

D 200 F

OTQ 11

What is the fixed overhead capacity variance?

A 3220 A

B 3220 F

C 2330 A

D 2330 F

OTQ 12

What is the fixed overhead efficiency variance?

A 6794 A

B 6794 F

C 14679F

D 14679A

Test Your Knowledge

If you can't answer all of the questions below without looking at the answer then you need to do some more work on this area!

1. What does the Sales Price Variance tell us?

2. What does the Sales Volume Variance tell us?

3. What does the Materials Price Variance tell us?

4. What does the Materials Usage Variance tell us?

5. What does the Labour Rate Variance tell us?

6. What does the Labour Efficiency Variance tell us?

7. What does the Idle time Variance tell us?

8. What does the Variable Overhead Rate Variance tell us?

9. What does the Variable Overhead Efficiency Variance tell us?

10. What does the Fixed Overhead Expenditure Variance tell us?

11. What does the Fixed Overhead Volume Variance tell us?

Lecture 14 Understanding Variances

Lecture 15
More Variances

Illustration 1

A soup manufacturing company makes soup using two raw materials, leeks and potatoes. The standard materials usage and cost of one litre of soup is:

		$
Leeks	4 @ $0.25 per Leek	1
Potatoes	6 @ $0.10 per potato	0.60
		1.60

In December 3,000 litres of soup were made using 8,000 leeks and 28,000 potatoes.

Calculate the Mix Variance.

Illustration 2

A soup manufacturing company makes soup using two raw materials, leeks and potatoes. The standard materials usage and cost of one litre of soup is:

		$
Leeks	4 @ $0.25 per Leek	1
Potatoes	6 @ $0.10 per potato	0.60
		1.60

In December 3,000 litres of soup were made using 8,000 leeks and 28,000 potatoes.

Calculate the Yield Variance.

Illustration 3

A company produces 3 products with the following budgeted information available:

	A	B	C
Sales Price	$14	$15	$18
Standard Full Cost	$10	$10	$13
Budget Production	10,000	13,000	9,000

The actual sales price and production were:

	A	B	C
Sales Price	$14.50	$15.50	$19.00
Budget Production	9,500	13,500	8,500

Calculate:

(i) The Sales Price Variance.
(ii) The Sales Volume Profit Variance.
(iii) The Sales Mix Variance.
(iv) The Sales Quantity Profit Volume Variance.

Illustration 4

ABC produces a product with a budgeted standard materials cost of $30. The price of materials rose during the period due to a world shortage to $40.

Actual production was 5000 units costing $225,000.

Calculate the Materials Price Variance and the Materials Price Planning Variance.

Illustration 5

ABC produces a product with a budgeted standard materials cost of $30. The price of materials rose during the period due to a world shortage to $40.

Actual production was 5000 units costing $225,000.

Calculate the Materials Price Variance and the Materials Price Operational Variance.

Illustration 6

ABC produces a product with a budgeted standard materials cost of $45. The price of materials rose during the period due to a world shortage to $55.

Actual production was 8000 units costing $416,000.

Calculate the Materials Price Variance and the Materials Price Planning and Operational Variance.

Illustration 7

A new product requires 4 hours of labour at a standard rate of $7 per hour.

The budget for the month is to produce 300 units.

Actual results:

Hours Worked	1400
Production	330 units
Wages Cost	$10,500

Management realised during the first day of the job that the job was more specialised than anticipated and that labour would have to be paid at $8 per hour but that the standard time should have been 3 hours per unit.

Calculate the labour rate variance, the labour efficiency variance and the planning and operational rate and efficiency variances.

Illustration 8

The budgeted sales volume for January is 100 units, with a selling price of $21 per unit and marginal cost of $11.

Due to uncontrollable factors, a revised budget of 80 units sold is implanted.

Actual sales for the month are 90 units.

What are the planning and operational sales volume variances?

Objective Test Questions

Fox Ltd operates a standard costing system

The standard direct material mix to produce 2,000Kg of output is as follows:

Material	Input Qty	Standard Price per Kg
A	1200	2.20
B	980	4.80

During August, the actual output of the product was 33,000 Kg

The actual materials issues to production were:

Material	Qty (Kg)
A	28000
B	11000

OTQ 1

Calculate the material mix variance for each material.

A A 6532F B 6532F

B A 6532F B 6532A

C A 6532A B 6532A

D A 6532A B 6532F

OTQ 2

Calculate the Yield Variance

A 19460A

B 19460F

C 2780A

D 2780F

OTQ3

H Ltd produces the Product A & B and the details are as follows:

	Product A	Product B
Budgeted sales volume	11000	14000
Actual Sales Volume	10500	14500
Profit per unit	$5	$6

Calculate the Sales Mix Profit Variance

A 500A

B 500F

C 2500A

D 3000F

OTQ4

Which of the following statements are correct?

A Planning variances are uncontrollable by management

B Planning variance are controllable by management

OTQ5

Which of the following statements are correct?

A Operational variances are uncontrollable by management

B Operational variance are controllable by management

OTQ6

Which of the following is correct when calculating Planning sales volume variance?

A Original Budgeted Sales Volume – Actual Sales Volume X Contribution per unit

B Original Budgeted Sales Volume – Revised Sales Volume X Contribution per unit

C Revised Sales Volume – Actual Sales Volume X Contribution per unit

D Original Budgeted Sales Volume – Revised Sales Volume X Variable cost per unit

Test Your Knowledge

If you can't answer all of the questions below without looking at the answer then you need to do some more work on this area!

1. What does the Materials Mix Variance tell us?

2. What does the Materials Yield Variance tell us?

3. What does the Sales Mix Profit Variance tell us?

4. What does the Sales Quantity Profit Variance tell us?

5. How is a planning variance calculated?

6. What is the principle of controllability?

7. How is an operational variance calculated?

8. What is the difference between a planning and an operational variance?

Lecture 16
Labour Variances

Lecture 17 Introduction to Budgeting

Objective Test Questions

OTQ1

Which of the following are an objective of a corporate organisation?

A Maximising Profit

B Decreased Growth

C Reduced EPS

D Decline in Sales

OTQ2

Which two of the following are steps of the Planning/Control Cycle?

1. Identify Objectives
2. Respond to divergences
3. Motivate employees
4. Compel planning

A 1 & 2

B All of the above

C 3 & 4

D 2& 4

OTQ 3

Which one of the following is a system objective?

A Communicate ideas/plans

B Identify Objectives

C Respond to divergences

D Evaluate strategies

OTQ4

Setting budget that have very high variables can cause which of the following problems?

A Demotivating

B Too easy

C Encourages slack

D Staff will not accept it

OTQ5

Which of the following is a disadvantage Participative budgeting?

A Time consuming

B Staff know departments

C Lower motivation

D More commitment

Test Your Knowledge

If you can't answer all of the questions below without looking at the answer then you need to do some more work on this area!

1. What is goal congruence?

2. State the 7 steps in the planning & control cycle.

3. What are the objectives of having a control system in the organisation?

4. State 3 problems with conflicting objectives when setting the budget.

5. State 3 problems with conflicting objectives when implementing the budget.

6. If a budget is set at too high a level what might be the consequences?

7. What are the advantages of an imposed budget?

8. What are the disadvantages of an imposed budget?

9. What are the advantages of an participative budget?

10. What are the disadvantages of an participative budget?

Lecture 18
Budgetary Systems I

Lecture 19
Budgetary Systems II

Objective Test Questions

OTQ1

How is an incremental budget approached?

A Changes with variables

B Same level as prior year

C All expenditure is justified

D Add a percentage to prior year

OTQ2

Which of the following is an advantage to zero based budgeting?

A Avoids wasteful activities

B Training required

C Short-termism

D Inflexible once set

OTQ3

Which of the following are the principles of activity based budgeting?

1 Control activities driving costs

2 removes non-value added elements

3 Responsibility Management

4 Focus on drivers

A 1,2 & 3

B 2 & 4

C 2, 3 & 4

D All of the above

OTQ4

Select one advantage and one disadvantage of rolling budgets?

A Up to date

B Managers lose control

C Time & Cost

D Forms basis for Zero Based Budgeting

OTQ5

When a company changes its method of budgeting, which of the following is a result of same

A Managers lose control

B Training

C Time & Cost

D Inflexibly

Test Your Knowledge

If you can't answer all of the questions below without looking at the answer then you need to do some more work on this area!

1. How is an incremental budget set?

2. Why would a business have a fixed budget?

3. What are the 3 steps in Zero Based Budgeting?

4. What are the benefits of ZBB?

5. What are the downsides of ZBB?

6. What is Activity Based Budgeting?

7. What are the benefits of ABB?

8. Describe a rolling budget.

9. What are the downsides of a rolling budget?

10. What are the downsides to changing the budgeting system in an organisation?

Lecture 20
Budgetary Control

Lecture 21
Budgetary Analysis

Illustration 1

The following information applies to a product:

Total Cost	Level of Activity
26,000	20,000
21,000	10,000

Calculate the split between fixed costs and variable costs using the high/low method.

Illustration 2

ABC have the following total costs and units of production for the six month period in question.

	Total Costs $	Units
January	13,600	2,100
February	15,800	2,800
March	14,500	2,200
April	16,200	3,000
May	14,900	2,600
June	15,000	2,500

Analyse the data into fixed and variable costs using linear regression analysis

Illustration 3

Using the information in illustration 2 calculate the correlation coefficient and the percentage change in costs that can be explained by changes in the level of activity.

Illustration 4

A business has had the following costs over the last year:

Quarter	Costs $'000
1	150
2	192
3	206
4	245

Calculate the average growth in costs over the year.

Illustration 5

A business has had the following sales over the last 5 years:

Year	Sales $'000
1	160
2	195
3	220
4	245
5	270

Calculate the average growth in sales over the year.

Illustration 6

A business has had a 12% increase in sales results each year over the last 5 years. The sales in the current period were $100,000.

Predict the sales for the following year.

Illustration 7

A business has had a trend of sales increases of 5% per quarter over the last 5 years. The seasonal variations for each quarter are shown below

Quarter	Seasonal Variation
1	25,000
2	-10,000
3	55,000
4	-70,000

The sales in Q4 of the current year were $100,000.

Forecast the sales for each of the 4 quarters of the next year.

Illustration 8

A business has had a trend of sales increases shown by the formula Y = 100 + 5X where Y = Sales in thousands and X is the quarter number.

X1 was Quarter 1 of 2009 making X5 Quarter 1 of 2010.

The seasonal variation is as shown below:

Quarter	Seasonal Variation
1	1.10
2	0.94
3	1.06
4	0.90

Forecast the sales for each of the 4 quarters of 2011.

Objective Test Questions

OTQ1

Total Cost	Level of Activity
13000	10000
10,500	5000

What are the variable and fixed costs using the high low method?

A VC = 1 FC = 800

B VC = 3 FC = 6000

C VC = 1.5 FC = 4500

D VC = 0.50 FC = 8000

OTQ2

No of pairs of data = 4

(000's)

$\sum X = 10.4$

$\sum Y = 180$

$\sum XY = 459.08$

$\sum X^2 = 78.2$

What is the variable and fixed costs?

A VC = 2.95 FC = 8150

B VC = 3.15 FC = 6500

C VC = 4.97 FC = 7230

D VC = 0.50 FC = 8000

OTQ3

Which of the following correlation coefficient results suggest no relationship?

A r = 1

B r = -1

C r = √1

D r = 0

OTQ 4

For seasonal variances within a company, when using the additive model, would the company

A Add the variation to the trend

B Multiply the variation to the trend

OTQ 5

For seasonal variances within a company, when using the multiplicative model, would the company

A Add the variation to the trend

B Multiply the variation to the trend

Test Your Knowledge

If you can't answer all of the questions below without looking at the answer then you need to do some more work on this area!

1. The total costs of production at ABC Co. are $25,000 when 5,000 units are produced and $35,000 when 7,000 units are produced. Calculate the total fixed costs and the variable cost per unit.

2. Why might regression analysis be used by a business?

3. Are there any problems with regression analysis?

4. ABC Co. had sales of $435,000 in 2005 and $500,000 in 2010. Calculate the average growth in sales each year between 2005 and 2010.

5. What are the 4 elements of time series analysis?

6. A business has had a 7% increase in sales results each year over the last 5 years. The sales in the current period were $200,000. Predict the sales for the following year.

7. A business has had a trend of sales increases of 3% per quarter over the last 5 years. The seasonal variations for each quarter are shown below

Quarter	Seasonal Variation
1	35,000
2	-20,000
3	27,000
4	-42,000

The sales in Q4 of the current year were $500,000.

Forecast the sales for each of the 4 quarters of the next year and the total sales for the year..

8. Are there any problems with time series analysis?

Lecture 22
Risk & Uncertainty

Illustration 1

ABC Ltd produces widgets and has the following expected sales volumes and costs

Price	$5	$6
Expected Sales:		
Best Case	17000	15000
Worst Case	10000	6000
Most Likely	15000	12000

Variable costs are $3 per unit and fixed costs are $20,000

What price should be chosen and why?

Illustration 2

Ed Co. are considering 2 options for investing their money in a new project. The expected probability of various profit levels are shown below.

Option 1		Option 2	
Probability	Profit	Probability	Profit
	£		£
70%	5000	20%	(1000)
30%	7000	20%	4000
		40%	7000
		20%	10000

Calculate an expected value for each option and advise Ed Co. on which option should be chosen.

Illustration 3

A company is considering a project which is expected to generate a return of $40,000. The investment required in the project is $100,000 and the sales generated are expected to be $250,000.

Calculate the sensitivity of the return generated to:

(i) The Investment in the project.
(ii) The sales generated by the project.

Illustration 4

Jim Co. sell smoothies to coffee shops and bars. A smoothie costs $3 to make and sells for $5 to the coffee shop or bar. The contribution per smoothie is therefore $2.

Jim Co. supplies smoothies on 350 days per year and based on previous experience the demand will be as follows:

Days	Demand
100	100 smoothies
120	200 smoothies
70	300 smoothies
60	400 smoothies

Each production run of smoothies is in batches of 100 so Jim Co. must decide how many smoothies to supply per day this year.

Construct a pay-off table to aid with this decision making process.

Illustration 5

Using each of the Maximax, Maximin and Minimax regret rules which option will Jim Co. choose when deciding on how many smoothies to supply each day?

Objective Test Questions

OTQ1

Calculate the expected value of the following

Probability	Profit
30%	(4000)
30%	4000
40%	5000

A 4400

B 2000

C 3000

D 5100

OTQ2

Which of the following is an advantage of Sensitivity Analysis?

A Identifies crucial areas

B No probabilities

C Assumes variables are not inter related

D Time and Cost

OTQ3

What is the purpose of a payoff table?

A Quantifies uncertainty

B Maximises Profit

C Calculates all the potential outcomes

D Researched Markets

OTQ4

Which of the following is the definition of minimax regret?

A minimises the opportunity cost of making the wrong decision

B Maximises minimum achievable profit

C Maximises maximum achievable profit

Test Your Knowledge

If you can't answer all of the questions below without looking at the answer then you need to do some more work on this area!

1. What is the difference between risk and uncertainty?

2. Do expected values deal with risk or uncertainty?

3. If there is a 35% chance that a project will make $10,000 and a 65% chance that it will make $25,000 what is the expected value?

4. What does the expected value tell us?

5. How do we deal with uncertainty?

6. If a project has an expected return of $400,000 and an initial investment of $1m what is the sensitivity margin of the project to the initial investment?

7. What is a pay-off table?

8. Explain the Maximin decision rule.

9. Explain the Maximax decision rule.

10. Explain the Minimax regret decision rule.

Lecture 23
Decision Trees

Illustration 1

A student is deciding how to get to class and has 2 choices:

1. Walk to class which is free.

2. Take the bus costing $5.

There is a 25% chance that it will rain and if it does the student will have to pay $10 to get their clothes dry cleaned.

Draw a decision tree to assess whether the student should walk or take the bus.

Illustration 2

Say that the student in the above illustration could take an umbrella to avoid getting wet when walking but there is a 10% chance that the student will lose the umbrella costing $20 at college.

Illustration 3

We have 3 choices, we can invest in stocks, bonds or put the money on deposit. The returns of each are sumarised below:

Market Direction	Return on Stocks	Return on Bonds	Return on Deposit
Up (50% chance)	$1,500	$900	$500
Even (30% chance)	$300	$600	$500
Down (20% chance)	-$800	$200	$500

(i) Calculate the expected value for investing in each of stocks, bonds and deposit.

(ii) Select the best investment for each of the 3 possibilities i.e that the market goes up, goes down and is even and calculate the expected value of these 'best' choices.

(iii) Based on the above answers, what is the price of perfect information in this instance?

Test Your Knowledge

If you can't answer all of the questions below without looking at the answer then you need to do some more work on this area!

1. What is a decision tree?

2. What is the decision?

3. What is the event?

4. How is each of the items outlined in Q2 & Q3 represented on the decision tree?

5. How is the value of perfect information calculated?