METIIA Paper 5 2024
1. **Augustus**
(a)
Profit and Loss Account for the year ended 31 May 2022

	£'000
Revenue	230.0
Cost of sales (W1)	(92.4)
Gross profit	137.6
Administrative expenses (W2)	(65.5)
Distribution costs (W3)	(31.6)
Depreciation (£72,000-£25,000) x 20%	(9.4)
Operating profit	31.1
Finance costs (£300+£200) (W4))	(0.5)
Profit for the year	30.6
Dividend	18.0
Transfer to reserves	12.6

(b)
Balance Sheet as at 31 May 2022

	2022
Non-current assets	*£'000*
Property, plant and equipment	37.6
Current assets	
Inventories (W1)	16.3
Trade receivables (W5)	16.8
Prepayment	0.4
	33.5
Total assets	71.1
Non-current liabilities	
8% Loan	3.0
Current liabilities	
Trade payables	17.5
Accruals (£200 (W4) + £400 (W3))	0.6
Bank overdraft	7.4
	28.5
Capital Account	
Balance as at 1 June 2021	30.0
Profit for the year	12.6
	42.6
	71.1

Workings:
(W1) Cost of sales

	£'000
Opening Inventory	18.7
Purchases for sale	90.0
Closing inventory (£17,500-(£5,000-£3,800))	(16.3)
	92.4

(W2) Administrative expenses

	£'000
Per trial balance	65.8
Irrecoverable debt (W5)	0.6
Reduction in allowance for receivables (W5)	(0.5)
Less: Insurance prepaid	(0.4)
	65.5

(W3) Distribution costs

	£'000
Per trial balance	31.2
Freight and delivery	0.4
	31.6

(W4) Loan interest accrual

	£'000
£3,000 x 8% x 10/12	0.2

(W5) Trade receivables

	£'000
Per trial balance	20.0
Allowance per trial balance	(3.1)
Reduction in allowance required	0.5
Irrecoverable debt (W2)	(0.6)
	16.8

c)

Inventory turnover = cost of sales /(average inventory)

= 92.4 /((16.3+18.7)/2)

=5.28

Inventory Days   =365/5.28 = 69 days

Therefore, the inventory days is higher than the industry average of 60 days, as the manager suspected. This is a significant issue, but the drawbacks of ratio analysis apply. Firstly, we do not have any historical data, so it is difficult to know whether this is an improving or declining trend. We also do not know enough about the business and whether seasonality, or a particular marketing plan

may have led to high stock levels at the year end. The business may not be typical of its sector, operating perhaps at the more expensive/high quality end of the sector.

Given that the company has a £7,400 overdraft and a £3000 long term debt, it is possible that cash generation is also a significant issue. This may partly be because cash is tied up in stock and may improve if stock turnover were faster, but it may also be due to other factors such as a decline in the market or incorrect pricing policy. Thus, it would be useful for the company to consider a wider range of issues rather than just focus on the inventory levels.

Good answers continued here by considering other ratios.

2 a)

Budget statement for 2022 for product REX		£ Original budget	£ Flexed budget	£ 3 Actual
Sales		120,000	112,000	113,120
Variable costs: -				
Materials	R	7,200	6,720	7,410
	X	6,000	5,600	10,220
Labour		94,500	88,200	84,740
Variable overheads		4,500	4,200	4,067
		7,800	7,280	6,683
Fixed overheads		5,600	5,600	8,250
Budgeted contribution to profit/(loss)		2,200	1,680	(1,567)

b) Operating statement for period: -

		Favourable	Adverse	£
Budgeted contribution				7,800
Sales variances				
Sales volume profit variance			520	
Sales price variance		1,120		
Actual sales less standard				8,400
Cost variances				
Materials price variance			4,930	
Materials usage variance			380	
Labour rate variance		2,410		
Labour efficiency variance		1,050		
Variable overhead exp. Var.		83		
Variable overhead eff. Var.		50		
Total variable cost variances				-1,717
Actual Contribution				6,683
Budgeted fixed overheads			5,600	
Fixed overhead exp. variance			2,650	
Actual fixed overhead				8,250
Actual profit				-1,567

Workings

Sales Volume		£
Budgeted	3,000	
Actual	2,800	
Sales volume variance	200 units (adverse)	
Standard contribution per unit (40-37.4)		
Sales volume variance		520 (Adverse)

Sales Price variance		
Revenue from 2,800 units should have been (x£40)		112,000
Actual revenue		113,120
Variance		1,120 (Fav)

Sales Quantity Variance

(Standard quantity of units sold – actual quantity of units sold) x standard contribution

3,000 – 2,800 x   £2.6   =   £520 Adverse

Sales Price Variance

standard selling price per unit – actual selling price per unit) x actual quantity of units sold

Actual selling price per unit = 113,120/2800 = £40.40
(40 – 40.40) x 2,800 =   £1,120 Fav.

Materials price
19,000 kg of R should cost (£0.30)	5,700	
But did cost	7,410	
		1,710 (Adv)
14,000 kg of X should cost (£0.50)	7,000	
But did cost	10,220	
		3,220 (Adv)
Total Material price variance		4,930 (Adv)

Material R
2,800 units of REX should use (x8kg) of R	22,400	
But did use	19,000	
R usage variance	3,400	
@ standard price £0.30		1,020 (Fav)

Material X
2,800 units of REX should use (x4kg) of X	11,200	
But did use	14,000	
X usage variance	2,800	
@ standard price £0.50		1,400 (Adv)

Total materials usage variance		380 (Adv)

Materials Price variance

(standard price – actual price per unit) x actual quantity

R £0.30 £0.39 x 19,000 =   £1,710 Adv

X £0.50- £0.73 x 14,000=   £3,220 Adv

Quantity variance

(standard quantity of actual production – actual quantity) x standard price

R ((2800 x 8kg) – 19000)x 0.30 = £1,020 Fav

Z ((2800x 4kg) – 14000) x 0.50 = £1,400 Adv

Labour rate
8,300 hours of labour should cost (x£10.50)   87,150
But did cost   84,740
Labour rate variance   2,410 (Fav)

Labour efficiency
To make 2,800 units of REX should take (x3)   8,400
But did take   8,300
Labour variance in hours   100 (Fav)
Standard rate per hour £10.50
Labour efficiency variance   1,050 (Fav)

Rate
(standard price – actual price per unit) x actual quantity

(10.50 – 10.21) x 8,300 = £2,410 Fav

Efficiency

(standard quantity of actual production – actual quantity) x standard price

((2,800x3) – 8,300) x £10.50 = £1,050 Fav

Variable Overhead expenditure
8,300 worked hours should cost (£0.50)   4,150
But did cost   4,067
Expenditure variance   83 Fav

Variable Overhead Efficiency
100 hours (Fav) at standard rate £0.50   50 Fav

Expenditure variance

(standard price – actual price per unit) x actual quantity

(£0.50 - £0.49) x 8,300 = £83 Fav

Efficiency variance
(standard quantity of actual production – actual quantity) x standard price

(8,400-8,300) x £0.50 = £50 fav

Fixed Overhead Expenditure Variance   5600-8250   2,650 (Adv)

    c)   Discussion of variances:

The adverse sales volume variance implies that the company is unable to sell enough units at that price point. It would be useful to consider the competitor prices, profit margins and cost structure to see if this shortfall can be eliminated.

The materials price and usage variances are both adverse. If only the usage variance is adverse then it may indicate that low quality materials were purchased, but as the price of these materials was higher than planned it is less likely. It is possible, if there has been a market shift that the price has increased significantly and so even at a higher price the company was still buying poor quality materials which lead to higher wastage.   It would also be useful to check whether additional staff training is needed to ensure that wastage is minimised.

The fixed overheads have also increased. This is one of the larger variances and the reasons for this need to be investigated and compared to industry norms. Overall, variance analysis is dependent on the accuracy of the data which is recorded and particularly the accuracy of the budget initially set. It works better for organisations with predictable regular production profiles rather than those who produce one off or bespoke items.

d)

Answers including discussion of the following: -

Advantages of variance analysis

Timely reports on the progress against budget

Aids in the monitoring of efficiency so that action can be taken.

Indicates performance of a project or department, or whole company.

Directs attention to the impact of external factors, such as competition and demand.

Disadvantages of variance analysis

Entirely dependent on the accuracy of the assumptions used to draw up the budget.

Can have a negative effect on staff if they feel it is a process of assigning blame.

Needs to be at the correct level of detail to allow effective analysis.

Can discourage innovation is staff over-focus on achieving targets.

3. Delphi Ltd.

(a) Calculate the cash flows and accounting profit.

Year	Sales	Expenses	Depreciation	Royalties	Profit	Capital	Cash Flow	Cumulative cash flow
	£'000	£'000	£'000	£'000	£'000	£'000	£'000	£'000
0						-700	-700	-700
1	340	-40	-70	0	230		300	-400
2	270	-130	-70	-34	36		106	-294
3	320	-160	-70	-27	63		133	-161
4	345	-185	-70	-32	58		128	-33
5	431	-205	-70	-35	122		192	159
6	330	-160	-70	-43	57		127	285
7	201	-100	-70		31		101	386
8	145	-47	-70		28		98	484
9	85	-28	-70		-13		57	541
10	39	-8	-70		-39	5	36	577
					572		577	

(i)   Payback period

The cumulative cash outflows reach £700,000 in the fifth year.

Payback period is 4 years + (33/(33+159))=4.17 years.

This providing that finance is available the payback period shows a return well before the end of the project life. Payback period has the advantage of being easy to use and understand. It is a very cautious method of investment appraisal which promotes liquidity. There is no need to calculate a discount rate, but equally this means that the calculation does not reflect the time value of money (this can be adjusted for by calculating the discounted payback period, but this is harder to understand). By nature of the method used, it fails to take into account cash flows which occur after the break even point.

(ii)   Accounting rate of return (ARR)

Choose suitable formula such as: -

Average annual profit   =   £57,240= 8.18%
Initial investment   £700,000

Or

Average annual profit including scrap   =   £57,700   = 16.6%
Average investment   (700-5)/2

The decision on this project will depend on the return which the company expects from its investments. The ARR is considered easy to use as it is based on familiar accounting terms. As with payback period, there is no need to calculate a discount rate, but equally this means that the calculation does not reflect the time value of money. Unlike payback period, ARR takes a view of the whole project, but it relies on the accounting policies and historic cost accounting of the organisation concerned.

(iii)   Net present value (NPV)

Year	Cash Flow	Discount rate 10%	Net Present Value	Discount rate 20%	Net Present Value
	£'000		£'000		£'000
0	-700	1	-700.0	1	-700.0
1	300	0.9091	272.7	0.8333	250.0
2	106	0.8264	87.6	0.6944	73.6
3	133	0.7513	99.9	0.5787	77.0
4	128	0.6830	87.4	0.4823	61.7
5	192	0.6209	118.9	0.4019	77.0
6	127	0.5645	71.6	0.3349	42.5
7	101	0.5132	51.8	0.2791	28.2
8	98	0.4665	45.7	0.2326	22.8
9	57	0.4241	24.2	0.1938	11.0
10	36	0.3855	13.9	0.1615	5.8
NPV			173.8		-50.4

The NPV is positive at a 10% discount rate which suggests that Delhi should go ahead with the project.

NPV takes into account the time value of money and considers all cash flows so it can be a useful tool. If necessary, the discount rate could be adjusted to consider risk. However, the NPV can be complex to understand, estimating the discount rate can be difficult, and there are specific concerns such as assuming that all cash flows occur at the end of the year.

(iv)   Internal rate of return (IRR)

IRR=Lowest discount rate + difference in discount rate x (NPV at lowest discount rate /Difference in NPVs)

= 10% +(10% x 173.8/(173.8+50.4)) = 17.75%

Therefore, as Delphi has a cost of capital of 10% it would be worthwhile undertaking the project.

IRR shares the advantages of NPV in taking into account the time value of money and all the cash flows. It also effectively provides a break even point as it is clear how much the discount rate could rise before the project would not be worthwhile. However, it is complex to understand and requires a discount rate as an acceptance criterion. In certain circumstances IRR may give misleading results (e.g., non-conventional cash flow) and it does not take into account total value added by the projects (scale).

(b)   Discuss other relevant financial information that might be needed including:
   (i)   Effects on sales of other products – decreased (competition) or increased (complementarity) sales on other products could also impact on the decision to launch.
   (ii)   Economic outlook, future of tax and inflation.
   (iii)   The size of this investment in the context of the overall size of the business and hence the degree of risk to the business as a whole.
   (iv)   Alternative projects which may be considered for this capital investment
   (v)   Impact on staff welfare and efficient working of the organisation
   (vi)   Impact on customers and supply chain relationships
   (vii)   Sensitivity of the revenue and cost numbers; discount rate and other assumptions.   – if the results are very sensitive to changes then the project is subject to more risks and the investment is less attractive. It would be worth considering by how much the assumptions could change without making the NPV negative or conducting other sensitivity analysis. Real options analysis or Monte Carlo simulations may be appropriate.

Question 4

(a)   Discuss why patents might be more effective in protecting product innovations than process innovations. Give examples to support your answer.   [50%]

A weaker answer will include a description of the course material and no detailed logic behind process vs product innovation and patents. Better answers will first detail what product and process innovations are and then cross-compare the pros and cons of product and process innovation in detail. They should be concluding that even though both are possible, the rule is patents are used more for product innovations. Product innovations are easier to copy as products can be re-engineered by the competition as they buy the products on the market. Meanwhile, internal processes cannot be seen by the public.

Patents are always published. This allows as well copying or building on top. Hence again, internal processes are better protected by secrecy.

Excellent answers state good examples and combine them to argue and state their point. Examples may be the case apple watch against Massimo and their health app sensor as discussed in class.

(b)   Discuss why a more turbulent business environment might encourage outsourcing and increased focus on core business among large firms.   [50%]

There are a number of advantages and disadvantages as discussed below and other factors to consider. In particular, it relates to transaction costs and economics of doing things internal vs external, but as well make vs buy decisions.

For example advantages of outsourcing R&D include:

(i) Potentially less expensive if R&D is used on an ad hoc basis

(ii) Gain from outside expertise and competence

(iii) Flexibility to cope with larger projects or to render cost base more variable

(iv) Frees management up to focus on more important or strategic issues

Disadvantages of outsourcing R&D

  (i)   May be cheaper in-house if R&D is a perpetual and continuing activity
  (ii)   Exposes firm to risk from poor quality or unreliable/unstable provider
  (iii)   Loss of organisational learning
  (iv)   Loss of control over intellectual property (IP). For example, who owns the development
  (v)   Might nurture competitors who can learn and move up the value chain e.g., Hyundai learning from Ford in automobiles.

Other factors to consider is what aspects of R&D to outsource; degree and seed of technological development and ability to keep up with knowledge.

A very good answer would take multiple answers like above and cross compare. They should always come to a "there is no one answer that fits all". There is a question of core competences of the firm and what the firm considers as strategically important.

Question 5

A Small Enterprise has historically machined and assembled fuel pumps for luxury cars. That market is declining. The company has begun to supply parts to the growing e-bike sector in the UK and Europe. The company is planning to scale up its operations and is considering how to innovate its *business model*.

a) Name and describe the key elements of a *business model*?

[20%]

b) Propose two alternative business models that would enable this company to scale up its operations.

[60%]

c) Discuss the limitations of your approach.

[20%]

(a) A business model is the approach to doing business that describes the revenue model and the accompanying cost structure that enables the firm to deliver the customer value proposition using the marketing mix. A business model summarises the architecture and logic of a business and defines the organisation's value proposition and its approach to value creation and value capture. Some definitions might also include the value network i.e., which firms the firm forms collaboration to design and deliver the proposition.

Other similar definitions are also acceptable as there are no standard agreed definition.

(b) Tools used to build thoughts on the business models may be porters 5 forces (e), swat analysis or value creation and capture or SWAT analysis of the internal capability. There may be others mentioned in the lectures.

Possible business models include among others (1) extend the market for turned parts (2) build on existing capabilities and extend turned parts on bike parts or on specialist high value vehicles (3) use assembly capability and do sub assembly for existing customers. (4) less direct answers could exclude the firms current capability and decide to act as a distributor for the bike companies and distribute for them in the home country or export to Europe from the UK.

A very good answer would apply a tool to design a strategy and then discuss strategy emergence vs planning and the outcome of the application of the tool.

Question 6

a) What is the significance of *Transaction Costs Theory*.

[20%]

b) Discuss the significance of Transaction Cost Theory for both small and large firms. Give Examples to support your answer.

[80%]

6. (a) a excellent answer will integrate all aspects below. A good answer some.

Transaction costs theory-Reasons for the existence of firms

Capitalist economy comprises two forms of economic organisation

- Market mechanism –prices determine the production and resource allocation

- Administrative mechanism –production and resource allocation made by managers and imposed through hierarchies

• Activities are undertaken by the firm or market depending on relative costs

- Transaction costs (search costs, contract negotiation and monitoring etc)

- Administrative costs (management coordination, employment contracts etc)

• The transaction costs > administrative costs then coordination of productive activities will be internalised within firms (Coase 1937).

Therefore a much of a mangers time is concerned with reducing transaction costs.

(b) smaller firms will have larger transaction costs working with larger firms. The larger firms are usually more complex in their contracting (highly complex contract with penalties), which often would bankrupt a SME if exercised. In contrast larger firms are very hard to move and to contract externally. They often employ vendors to buying in material, especially less important parts and sub parts. This makes the navigation of a larger firm highly complex, even when internal to the firm it takes time to understand who the decision makers are.

Examples discussed in the lectures are the BMW garage, where startups and SME's can introduce relevant innovative technology to the firm. Instead of investing, the staff in the "garage" will find a "buyer" within the firm and run the contracting for the SME and or startup. This means there are better ways and worse ways of transacting between companies.

A good answer would as well give an example from the press (e.g. financial times) and be structured in their approach.