Version FTU/6

MET2
MANUFACTURING ENGINEERING TRIPOS PART IIA

Thursday 5th May 2022 9.00 to 12.10

Paper 5

MODULE 3P8: FINANCIAL AND MANAGEMENT ACCOUNTING
(SECTIONS A AND B)

MODULE 3P9: INDUSTRIAL ECONOMICS, STRATEGY AND GOVERNANCE
(SECTIONS C AND D)

*Answer **four** questions, one from each of sections **A, B, C and D**.*

*Answers to sections **A, B, C and D** must appear in four separate booklets.*

All questions carry the same number of marks.

*The **approximate** percentage of marks allocated to each part of a question is indicated in the right margin.*

*Write your candidate number **not** your name on the cover sheet and at the top of each answer sheet.*

STATIONERY REQUIREMENTS
8 page answer booklet x 4

SPECIAL REQUIREMENTS TO BE SUPPLIED FOR THIS EXAM
CUED approved calculator allowed
Engineering data books
Discount rate data sheet

10 minutes reading time is allowed for this paper at the start of the exam.

You may not start to read the questions printed on the subsequent pages of this question paper until instructed to do so.

You may not remove any stationery from the Examination Room.

SECTION A

Answer one question from this section

1 Sanna Ltd. manufactures and sells miniaturised robotics. Table 1 shows the trial balance of Sanna's business, as at 31 March 2019.

Table 1

	£	£
Sales		170,868
Purchases	113,034	
Sales returns	7,128	
Purchase returns		6,452
Delivery costs	272	
Salaries	11,124	
Electricity	520	
Stationery	198	
Rent	6,344	
Fixed assets at cost		
- Plant and machinery	52,000	
- Fixtures and fittings	34,800	
Accumulated depreciation		
- Plant and machinery		30,700
- Fixtures and fittings		13,920
Opening stock	5,762	
Trade debtors	81,082	
Trade creditors		50,270
Provision for doubtful debts		6,674
Bad debts written off	2,988	
Cash	73,632	
Long term debt		30,000
Equity		80,000
	388,884	388,884

(cont.

Additional notes:

- Stock at 31 March 2019 was listed at £4,672 but only expected to be sold for £3,793;
- There were accrued salaries of £834 at 31 March 2019;
- Rent of £453 has been prepaid for April and May 2019;
- Plant and machinery depreciation is calculated on a reducing balance basis at 20%;
- Fixtures and fittings depreciation is calculated on a straight line basis at 10%;
- Debtors amounting to £215 are irrecoverable;
- Interest is overdue on the long term loan at a rate of 5% per annum;
- It is Sanna Ltd's intention to declare a total dividend of £10,000 if profit is sufficient.

Using the trial balance and notes: -

(a) Calculate the cost of sales for the year ending 31 March 2019 [10%]

(b) Calculate the depreciation charge for the year ending 31 March 2019 [10%]

(c) Prepare a trading profit and loss account for Sanna's business for the year ending 31 March 2019 [50%]

(d) Explain the accruals method in financial accounting. Describe how the concepts of *prudence* and *consistency* relate to the recognition of profits and losses in financial statements. [30%]

2 e-Bike Deliveries Ltd. and Scooter Service Ltd. are both small businesses, distributing packages and providing expert packaging services to customers in different areas of the same city. They began trading, on 1 January 2019 and 1 June 2019, respectively.

In Table 2 are key financial ratios for Scooter 31 January 2019.

Table 2

	Scooter
Gross profit margin	16%
Net profit margin	10%
Current ratio	1.4
Acid test ratio	0.8
Inventory days	43
Receivables days	20
Payables days	45
Debt to Equity	4:1

Table 3 shows eBike's books of account at December 2019.

Table 3

	£
Sales	10,000
Cost of Sales	5,995
Other costs	900
Depreciation	2,100
Receivables	1,546
Payables	800
Inventory	756
Long term debt	12,000
Equity	6,000

(a) Explain the method of calculation for each ratio given in Table 2. [15%]

(b) Calculate the same ratios for eBike Delivery Ltd. as are shown in Table 2 for Scooter Service Ltd. [25%]

(c) Compare the performance of the two firms. [15%]

(cont.

(d) Discuss any limitations of your analysis. [25%]

(e) Define the term *leverage* in the context of a company's financing and explain why a company may choose a high or low leverage strategy [20%]

SECTION B

Answer one question from this section

3 Company Alpha Ltd. produces two products (Beta and Gamma) and is planning the allocation of available resources for the year. 150 units of Beta and 120 units of Gamma are required to be produced this year. 1800 hours of machine capacity are available. Any shortfall in production can be made up by purchase of components from a wholesale supplier. Alpha's objective is to minimise the total cost of product manufacture.

Table 4 presents data for the two products.

Table 4

	Beta	Gamma
	£	£
Direct material related costs per unit	18	26
Direct labour related costs per unit	15	22
Variable overhead per unit	3.5	4
Fixed production overhead per unit	15	20
Machine hours per unit	6 hours	9 hours
Purchase price from wholesaler	£55.5	£77

(a) Calculate the number of units of each product that Alpha Ltd. should manufacture in-house and the number that should be purchased from the wholesale supplier. [60%]

(b) Calculate Alpha Ltd's total cost of production and profit if the sales price of Beta is £70 and Gamma is £76. [20%]

(c) Discuss the potential issues with this method of deciding on the production schedule and the assumptions that Alpha Ltd. may need to challenge. [20%]

4 Hamptons Ltd. is manufacturing company that has a range of six investment possibilities (A to F) However, the company already has a large amount of debt and only has access to a total of £620,000 for investment. Hampton's cost of capital is 12% per year. A discount rate data sheet is provided at the end of the paper.

Table 5 shows expected net cash flows (including residual values):

Table 5

	Year					
£	0	1	2	3	4	5
A	(264,000)	75,000	75,000	75,000	75,000	75,000
B	(195,000)	77,000	89,500	81,000		
C	(170,000)	38,000	50,000	50,000	50,000	50,000
D	(180,000)	62,000	60,000	62,000	60,000	
E	(170,000)	50,000	60,000	62,000	60,000	
F	(160,000)	82,000	60,000	62,000		

(a) Calculate the expected Net Present Value for each project and rank the projects based on the funds available. Suggest an appropriate combination of projects for investment. [30%]

(b) Hamptons Ltd. uses a profitability index equal to $\frac{NPV}{InitialOutlay}$ to calculate the profitability of each project. Calculate this index for each project and rank the projects for investment based on the funds available. Suggest an appropriate combination of projects for investment. Explain briefly why the rankings differ from that in (a) above. [25%]

(c) Some directors of Hamptons Ltd. believe that the company should only invest in projects which can return the investment by year 3 when the debt is due for repayment. Suggest an appraisal technique that could be used to assess the investment options under these conditions and rank the projects for investment accordingly. Suggest an appropriate combination of projects for investment. Consider the potential advantages and disadvantages of the suggested technique and issues which Hamptons Ltd. should consider before investing. [30%]

(d) Explain if and how uncertainty and risk could be considered in the investment process. [15%]

SECTION C

Answer one question from this section

5 (a) What makes a successful *Strategy*? [20%]

(b) Explain how a firm can implement its strategy, using examples of positioning within an industry and its capabilities. [80%]

6 (a) Discuss why patents might be more effective in protecting *product innovations* than *process innovations*. [50%]

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

SECTION D

Answer one question from this section

7 A new firm intends to sell high quality generators to lower income communities in South America where the electricity from the grid is either not available or not reliable

(a) Explain the possible forms of market segmentation. [20%]

(b) Choose one of the segmentation forms identified in (a) above and explain how to perform the segmentation of the market for the generator product. [40%]

(c) Discuss the challenges of using the method chosen in (b) for the power generation market in South America. [40%]

8 (a) Define *competition* [20%]

(b) How should a traditional internal combustion engine car manufacturer assess its competition? Discuss the implications for maintaining its competitive advantage. [80%]

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Thursday 5th May 2022, Module 3P8/3P9, Question 4

Discount Rate Data Sheet

Discount rate p.a., r	Number of years, T	Present value of £1 receivable at the end of T years, $PV = \frac{1}{(1+r)^T}$
0.05	1	0.9524
	2	0.9070
	3	0.8638
	4	0.8227
	5	0.7853
	6	0.7462
	7	0.7107
	8	0.6768
	9	0.6446
	10	0.6139
0.10	1	0.9091
	2	0.8264
	3	0.7513
	4	0.6830
	5	0.6209
	6	0.5645
	7	0.5132
	8	0.4665
	9	0.4241
	10	0.3855
0.12	1	0.8929
	2	0.7972
	3	0.7118
	4	0.6355
	5	0.5674
	6	0.5066
	7	0.4523
	8	0.4039
	9	0.3606
	10	0.3220
0.15	1	0.8696
	2	0.7561
	3	0.6575
	4	0.5718
	5	0.4972
	6	0.4323
	7	0.3759
	8	0.3269
	9	0.2843
	10	0.2472