

MET2

MANUFACTURING ENGINEERING TRIPOS PART IIA

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Thursday 6th May 2021 9.00 to 12.10

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**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.*

*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**

Write on single-sided paper

You may type your answers

**SPECIAL REQUIREMENTS TO BE SUPPLIED FOR THIS EXAM CUED**

approved calculator allowed

You are allowed access to the electronic version of the Engineering Data Books

Discount Rate Data Sheet

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

**The time taken for scanning/uploading answers is 30 minutes.**

**Your script is to be uploaded as a single consolidated pdf containing all answers.**

**SECTION A**

Answer one question from this section

1 The following financial information was extracted from the books of AGA Ltd.  
Balances 31 January 2019:

	£
Fixed Assets	
Land and buildings - at cost	700,000
Equipment - at cost	320,000
Motor vehicles - at cost	230,000
Accumulated depreciation	
Land and buildings	100,000
Equipment	186,000
Motor vehicles	96,000
Ordinary shares of £5 each	500,000
Share premium	120,000
Retained earnings at 1 February 2018	125,000
Inventory at 1 February 2018	37,100
Trade receivables	102,000
8% Long-term loan	150,000
Provision for doubtful debts	2,100
Revenue	985,000
Purchases	428,000
Administrative expenses	346,000
Distribution costs	144,000
Interim dividend paid	20,000

Inventories at 31 January 2019 included 100 units of damaged items. These items, with a unit cost of £80, were all sold on 2 February 2019 for £65 each. At 31 January 2019 all other inventories were valued at a cost of £36,000 and had a net realisable value of £85,400.

The administrative expenses include an amount of £30,000 for a machine purchased on 1 February 2018. The machine has a useful life of three years and will then be scrapped

with nil proceeds.

The figure for land and buildings (at cost) includes land which had a cost of £300,000, with the remainder being buildings.

During the year, AGA Ltd. purchased a motor vehicle which cost £60,000. This was settled by a payment of £40,000 from the bank and the part exchange of an old vehicle. This old vehicle had originally cost £75,000 and had been depreciated by £27,000. Only the bank payment had been recorded in the books of account.

Depreciation is to be charged on the following basis:

- Land - not depreciated;
- Buildings - straight-line method over 25 years;
- Equipment - straight-line method over 5 years;
- Motor vehicles - reducing balance method at 20% per annum.

The company policy is to charge a full year's depreciation in the year of purchase and none in the year of sale.

Trade receivables included an irrecoverable debt of £8,800. A provision for doubtful debts of 4% is also to be maintained.

The loan was obtained on 1 September 2018.

- (a) Calculate the depreciation charges for the year ended 31 January 2019 and the net book value of the assets as at 31 January 2019. Comment on the considerations necessary for a company in setting depreciation policies. [40%]
- (b) Prepare the income statement for the year ended 31 January 2019. [40%]
- (c) The directors are considering making a further cash dividend. What factors should the directors take into account when making this decision? [20%]

2 The following financial information related to Globe Co:

	2019	2018
	<u>£000</u>	<u>£000</u>
Sales all on credit	37,400	26,720
Cost of Sales	<u>34,408</u>	<u>23,781</u>
Operating Profit	2,992	2,939
Interest	<u>395</u>	<u>274</u>
Profit before tax	2,597	2,665

	2019		2018		2017	
	£000	£000	£000	£000	£000	£000
Non-current Assets		13,632		12,750		11,000
Current Assets						
Inventory	4,600		2,400		2,000	
Trade receivables	4,600		2,200		1,500	
		9,200		4,600		3,500
Current Liabilities						
Trade payables	4,750		2,000		1,500	
Overdraft	3,225		1,600		1,000	
		<u>7,975</u>		<u>3,600</u>		<u>2,500</u>
Net Current Assets		1,225		1,000		1,000
8% Bonds		<u>2,425</u>		<u>2,425</u>		<u>2,425</u>
		12,432		11,325		9,575
Capital and Reserves						
Share Capital		6,000		6,000		6,000
Reserves		<u>6,432</u>		<u>5,325</u>		<u>3,575</u>
		12,432		11,325		9,575

The fixed rate 8% bonds are redeemable after ten years.

(a) For 2019 and 2018 calculate the interest (debt service) coverage ratio, debt to equity ratio, current ratio, quick ratio, inventory days, receivables days and payables days. [35%]

- (b) Calculate the interest rate paid on average overdraft and discuss the possible effects on Globe Co of an increase in interest rates on its overdraft. [20%]
- (c) By considering the ratios calculated and any other relevant analysis, discuss whether or not Globe Co is overtrading and likely to face difficulties in cash flow. [20%]
- (d) Discuss any difficulties with relying on ratio analysis for decision making. [25%]

**SECTION B**

Answer one question from this section

3 Mallard Ltd manufactures high quality wooden duck ornaments. The company operates a standard costing system. The managing director is very concerned that the actual profit for the month at £22,770 is significantly less than the budgeted profit of £90,000. The cost accountant provides the following information.

	Budget		Actual	
	Quantity	Price	Quantity	Price
<b>Sales</b>	800 ducks	£650	860 ducks	£600
<b>Material (wooden plank)</b>	25cm per duck	£5.5/cm	35cm per duck	£4.5/cm
<b>Labour</b>	15 hrs per duck	£20/hr	19 hrs per duck	£17/hr

The cost accountant has also calculated the relevant variances.

The managers of the relevant departments have seen the figures above and have made some initial comments.

Manager responsible for sales: *'The price variance was the result of having to lower the price because of increased competition.'*

Manager responsible for materials: *'The price variance was the result of negotiating a much better deal with a new supplier.'*

Manager responsible for labour: *'We have followed other companies in the industry and employed workers on zero hour contracts and this has reduced our wage bill.'*

The Managing Director believes that the managers may be covering for each other and that the reasons given are not the real causes of the variances, which he suspects may have been caused internally.

- (a) Prepare a flexed budget analysis. [20%]
- (b) Calculate all price/cost and quantity variances. [25%]
- (c) Prepare a standard cost reconciliation. [25%]
- (d) Assess the significance of the variances on the performance of the business and the Managing Director's view that the variances are caused internally. [30%]

4 Whistle Co plans to buy a new machine. The cost of the machine, payable immediately, is £800,000 and the machine has an expected life of five years. Additional investment in working capital of £90,000 will be required at the start of the first year of operation. At the end of five years, the machine will be sold for scrap, with the scrap value expected to be 5% of the initial purchase cost of the machine. The machine will not be replaced. Production and sales from the new machine are expected to be 100,000 units per year. Each unit can be sold for £16 per unit and will incur variable costs of £11 per unit. Incremental fixed costs arising from the operation of the machine will be £160,000 per year. Whistle Co has a cost of capital of 10%. The company pays royalties on profit one year in arrears at a rate of 30% per year.

(a) Calculate the *Net Present Value* (NPV) of investing in the new machine and advise whether the investment is financially acceptable. Discuss the possible issues with this means of investment appraisal. [40%]

(b) Calculate the *Internal Rate of Return* (IRR) of investing in the new machine and advise whether the investment is financially acceptable including the possible issues with this means of investment appraisal. [30%]

(c) The company carries out a sensitivity analysis to establish the percentage change in a variable which would bring the *NPV* to zero. Calculate the sensitivity of the investment in the new machine to a change in the selling price, the discount rate and the scrap value. Comment on this analysis. [30%]

## SECTION C

Answer one question from this section

5 (a) Define *Transaction Costs Theory*, and give examples of its application. [20%]

(b) Explain how a firm can reduce transaction costs and give examples to support your answer. [80%]

6 (a) Define product innovation and process innovation. [20%]

(b) A car manufacturer intends to change from combustion engine production to electric vehicles following the government's ban on new petrol and diesel car sales from 2030. The firm and their suppliers are involved in many aspects of innovation. Discuss the difference between product and process innovation in this case and the challenges for the manufacturer in implementing them. [80%]



**SECTION D**

Answer one question from this section

7 (a) What is a layered module architecture for digital platforms? Give examples to support your answer. [30%]

(b) Discuss how Amazon has been able to strategically design its layered module architecture in building its digital platform business models. [70%]

8 (a) Define the *Bass Model*. Elaborate with a general example. [20%]

(b) Discuss the impact of the Bass Model on product introduction, market performance expectations and maturity lifecycle. Use examples of new product introduction to support your answer. [80%]

Version FTU/6

**END OF PAPER**

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MANUFACTURING ENGINEERING TRIPOS PART IIA

Thursday 6th May 2021, 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
0.15	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
0.20	1	0.8333
	2	0.6944
	3	0.5787
	4	0.4823
	5	0.4019
	6	0.3349
	7	0.2791
	8	0.2326
	9	0.1938
	10	0.1615