UNIVERSITY OF CAMBRIDGE

ENGINEERING TRIPOS PART IIB
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Monday 9 May 2005 9 to 10.30

Module 4E6

ACCOUNTING AND FINANCE

*Answer not more than **two** questions.*

All questions carry the same number of marks.

Submit all workings.

Calculations are to be made to the nearest £, unless told otherwise.

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

Attachments:
Special Data Sheet (2 pages)

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

(TURN OVER

1 Lithium Ltd is a mining company. It has just discovered a mineral deposit and its directors have to decide on the worth of mining operations. The following information has been discovered in the course of preliminary investigations:

a) Costs of £225,000 have been incurred on surveys to locate the deposit and estimate its volume. On average, these costs were incurred one year ago.

b) On average, two out of every three surveys undertaken by Lithium are abortive. The directors believe that each successful project should be charged with three times its actual survey costs to make sure that the company covers its costs overall.

c) At the commencement of mining, it would be necessary to incur outlays of £864,000 for tunnelling and development of the site and of £328,000 on mining equipment.

d) The quantity of mineral in the deposit is estimated to be 500,000 tons. The price of the mineral at the present time is £16 per ton and the price is expected to increase at the rate of 25 percent per annum over the next five years because of the scarcity of the mineral. (If mining commenced immediately, the first output would be sold after one year for £20 per ton).

e) Mining would require three hours of labour per ton. Present wage rates are £2 per hour. There is a scarcity of labour with the necessary skills and consequently all employees would have to be transferred from a nearby site owned by Lithium. The company would have to accept a loss of cash contribution from its other operations of £1 per hour (allowing for inflation) on labour transferred from the other site. However, the labour shortage is expected to last for only one year. Other variable costs of mining would be £3 per ton. Wage rates and other variable costs are expected to increase at 20 percent per annum.

f) On completion of mining, the company would need to make the site good at a cost of £450,000. The mining equipment would have a life of 10 years, at which time it would have negligible value. It could be transferred to another site in five years time and would save costs having a value of £150,000 at that time. Both of these estimates include an allowance for inflation. Depreciation is calculated evenly over the life of the equipment.

g) The cost of capital of Lithium is estimated at 20 percent per annum and the company's target rate of return on capital employed is 70 percent.

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Assume that the annual receipts and payments arise at the end of each year.

Requirements

a) Prepare calculations to estimate whether it is worthwhile for Lithium to proceed with the proposed mining project. (assume an extraction rate of 100,000 tons per annum.) [60%]

b) Calculate the return on capital employed of the project, over the five years, treating it as an incremental change. [40%]

2 The managing director of Tiger plc is concerned that his company is not trading efficiently and therefore is losing profits. At the moment the company has no formal budgeting procedures. The financial accountant and production manager have produced the following information for the first six months of 2006:

a) Sales

The company has one product, the CAT. Sales are seasonal with sales in the months of March, April and May being twice the amount sold in other months of the year. Tiger plc expects to sell 45,000 CATs in the first half of 2006.

The current selling price is £25 per unit; there will be a price increase of 20 percent in April 2006.

b) Production

Each CAT uses 10 kg of raw materials. Tiger plc has a contract with the raw material supplier for monthly deliveries at a fixed price of £60 per 100 kg. This contact expires at the end of April 2006, when it is expected that the price will be increased by 25 percent (ie price will be increased from 1 May 2006).

Tiger has two categories of labour. Each CAT requires one hour's work by a skilled employee and two hours' work by an unskilled employee. The current wage rates are £5 per hour for skilled workers and £3 per hour for the unskilled.

Production overheads are estimated to be £5 per CAT.

c) Stocks

In order to keep the production line running smoothly it is necessary for Tiger plc to hold enough raw material stocks to meet 80 percent of the following month's production quota.

To satisfy customer demand the company holds enough stocks of finished goods to meet 50 percent of the next month's sales.

Stock levels are expected to be:

	1 January 2006	***30 June 2006***
Raw materials	40,000 kg	40,000 kg
Finished goods	2,500 units	2,500 units

Stocks of finished goods are valued at full production cost.

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Requirements

a) Prepare the following functional budgets for the six-monthly period to 30 June 2006:

i) material usage (in kg only)

ii) material purchases

iii) labour utilisation (skilled and unskilled) [56%]

b) Prepare a budgeted profit and loss account for the six months to 30 June 2006 [32%]

c) Write notes for a meeting with the managing director where you will have to explain why Tiger plc should introduce a budgeting system [12%]

3 What do you understand by the term 'creative accounting'? Discuss six (6) cases which have involved 'creative accounting'. [100%]

END OF PAPER

Discounting

(1) Present value of £1

$$1/(1+r)^n$$

(2) Present value of an annuity of £1

$$(1/r)(1-(1/(1+r)^n))$$

where r = interest rate
n = number of years

Rate Pa	*Number of years n*	*Present value of £1 receivable at the end of n years*	*Present value of £1 receivable at the end of each of n years*
1%	1	0.990	0.990
	2	0.980	1.970
	3	0.971	2.941
	4	0.961	3.902
	5	0.951	4.853
	6	0.942	5.795
	7	0.933	6.728
	8	0.923	7.652
	9	0.914	8.566
	10	0.905	9.471
5%	1	0.952	0.952
	2	0.907	1.859
	3	0.864	2.723
	4	0.823	3.546
	5	0.784	4.329
	6	0.746	5.076
	7	0.711	5.786
	8	0.677	6.463
	9	0.645	7.108
	10	0.614	7.722
10%	1	0.909	0.909
	2	0.826	1.736
	3	0.751	2.487
	4	0.683	3.170
	5	0.621	3.791
	6	0.564	4.355
	7	0.513	4.868
	8	0.467	5.335
	9	0.424	5.759
	10	0.386	6.145
15%	1	0.870	0.870
	2	0.756	1.626
	3	0.658	2.283
	4	0.572	2.855
	5	0.497	3.352
	6	0.432	3.784
	7	0.376	4.160
	8	0.327	4.487
	9	0.284	4.772
	10	0.247	5.019
20%	1	0.833	0.833
	2	0.694	1.528
	3	0.579	2.106
	4	0.482	2.589
	5	0.402	2.991
	6	0.335	3.326
	7	0.279	3.605
	8	0.233	3.837
	9	0.194	4.031
	10	0.162	4.192