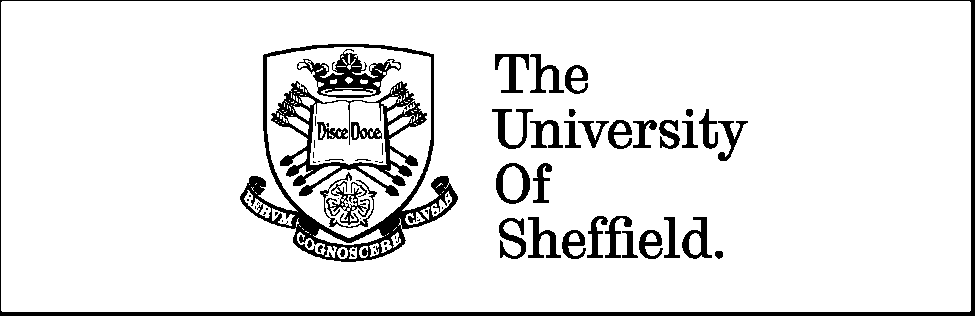
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**MGT388**

**MANAGEMENT SCHOOL Autumn Semester 2016-2017**

**Finance and Law for Engineers 1 Hour 30 minutes**

**Answer ANY TWO questions only from three**

**All questions carry equal marks**

**Questions start from page two onwards**

**Present value table attached**

**Question One**

In January 2013 you set up a company Smart Service Ltd which specialises in repairing and servicing computers and related equipment for businesses in the South Yorkshire area. The company has been successful and in order to expand new premises have been leased and specialised equipment acquired. However, the most recent set of accounts and your overdraft position have given you cause for concern.

**Statement of Financial Position for Smart Service Ltd as at:**

**31 December 2016 31 December 2015**

**ASSETS £ £**

***Non-Current Assets***

Property and equipment 220,000 150,000

***Current assets***

Inventories 67,500 56,700

Trade receivables 54,000 27,000

Cash 0 0

121,500 83,700

**TOTAL ASSETS** 341,500 233,700

**EQUITY AND LIABILITIES**

***Equity***

Share capital 50,000 50,000

Retained earnings 94,400 46,000

144,400 96,000

***Non-current Liabilities***

Loans 81,000 81,000

***Current Liabilities***

Trade payables 51,300 33,750

Overdraft 64,800 22,950

116,100 56,700

**TOTAL EQUITY AND LIABILITIES** 341,500 233,700

**Question 1 continued**

**Income Statement for Smart Service Ltd for:**

**31 December 2016 31 December 2015**

**£ £**

Revenue 461,700 324,000

Cost of sales (230,850) (202,500)

Gross profit 230,850 121,500

Administration expenses (120,800) (47,500)

Selling and Distribution costs (44,050) (28,700)

Operating profit 66,000 45,300

Finance costs (5,500) (4,050)

Profit before tax 60,500 41,250

Taxation (12,100) (8,250)

Profit for the year 48,400 33,000

**REQUIRED**

1. Explain the purpose and usefulness of a Statement of Financial Position and Income Statement. **(10 marks)**
2. Using the above information calculate the following ratios for the years ending 31 December 2015 and 2016:

Return on capital employed

Gross profit margin

Inventory days

Trade receivable days

Trade payable days

Current ratio

Quick ratio  **(14 marks)**

**Question 1 continued**

1. Evaluate the financial performance of Smart Services Ltd using the ratios calculated in part (b) and the following ratios obtained from the financial statements of a competitor:

Return on capital employed 32%

Gross profit margin 45%

Inventory days 65 days

Trade receivable days 30 days

Trade payable days 50 days

Current ratio 1.7 times

Quick ratio 0.8 times **(16 marks)**

1. Explain using your knowledge of financial statements how it is possible that Smart Service Ltd can be profitable and yet be short of cash and need to increase the overdraft during 2016. **(10 marks)**

**Total 50 marks**

**Question Two**

Rio Ltd, manufactures specialised rowing machines and treadmills.

***Rowing Machines***

The company is constantly improving its products by investing in research and development. It has recently been able to manufacture a rowing machine which will allow a person who is training to interact with others who are training at the same time.

At the moment no other company in the market has a similar product and so Rio Ltd has obtained a patent which will last for 2 years.

The cost of producing the new interactive rowing machine is as follows:

Direct material £280

Direct labour £110

Direct expenses £30

In addition the rowing machines will need to pass through two production departments.

The first production department is highly mechanised and it is estimated that the interactive rowing machine will use 18,000 of the 27,000 machine hours available. The total overheads for this department are expected to be £162,000.

The second production department involves the packing and checking of machines and the overheads of £224,000 should be spread over the number of machines produced. In the period under review 2,000 rowing machines are expected to be produced, 800 of which will be interactive model.

***Treadmills***

The market for the treadmills sold by Rio Ltd is in decline with the current market price estimated to be £780. The Directors of Rio Ltd are looking to discontinue production of treadmills as the machines are loss making at the current market price.

There is no alternative use for the equipment that is used to manufacture the treadmills and once production has been stopped it would be technically difficult and costly to re-commence production.

The variable cost of producing a treadmill is as follows:

Direct material (variable) £420

Direct labour (variable) £220

Direct expenses (variable) £40

In addition fixed costs of £150 are allocated to each treadmill. Currently the research and development team are looking to improve the treadmill which would increase the sales price that could be achieved.

**Question 2 continued**

**REQUIRED**

1. Define the terms direct costs, indirect costs, variable costs and fixed costs. **(12 marks)**
2. Calculate the product cost for the ***interactive rowing machine***. **(11 marks)**
3. The fitness market is characterised by large number of buyers and sellers so it is likely the price Rio Ltd can obtain for its rowing machines and treadmills is largely determined by the market.

Explain the pricing mechanism and how market prices are determined.

**(8 marks)**

1. The ***interactive rowing machine*** is a new product with a limited life cycle. Explain the effect that this will have on the pricing decision, and recommend a suitable launch price. **(7 marks)**
2. Discuss whether the production of ***treadmills*** should be discontinued. In your answer define and explain the importance of contribution in short term decision making.

**(12 marks)**

**Total 50 marks**

**Question Three**

Thrills and Spills Ltd is a company that operates water parks in the UK. Thrills and Spills Ltd has recently bought a failing park in South Yorkshire and has requested a report on its future potential. The current price of a ticket for entry into the park is £20 regardless of age, the number of people in a party or the time of year that a visit is made. The park has variable costs of £8 per visitor and annual fixed costs of £360,000. Over the last 3 years the average annual number of visitors was calculated to be 28,000.

In order to relaunch the water park the Directors of Thrills and Spills Ltd are acquiring and developing a plot of land adjacent to the park. As part of the report on the future of the water park the Directors would like a comparison of two alternative uses of the area.

Under alternative 1 the area would be used as a surf centre and under alternative 2 a scuba diving centre would be built. Tickets for this additional attraction will either be sold at a discount with a ticket to the main park or separately via a different entrance. The Directors expect the park will generate revenues and cost as follows:

Surf Centre Scuba Diving Centre

Revenues Costs Revenues Costs

£ £ £ £

Initial cost 130,000 60,000

Year 1 50,000 50,000 35,000 5,000

Year 2 70,000 20,000 35,000 5,000

Year 3 80,000 20,000 20,000 10,000

Year 4 90,000 30,000 20,000 10,000

Year 5 90,000 20,000 30,000 5,000

The cost of capital for Thrills and Spills Ltd is 6%.

Present value tables at the end of the paper.

**Question 3 continued**

**REQUIRED**

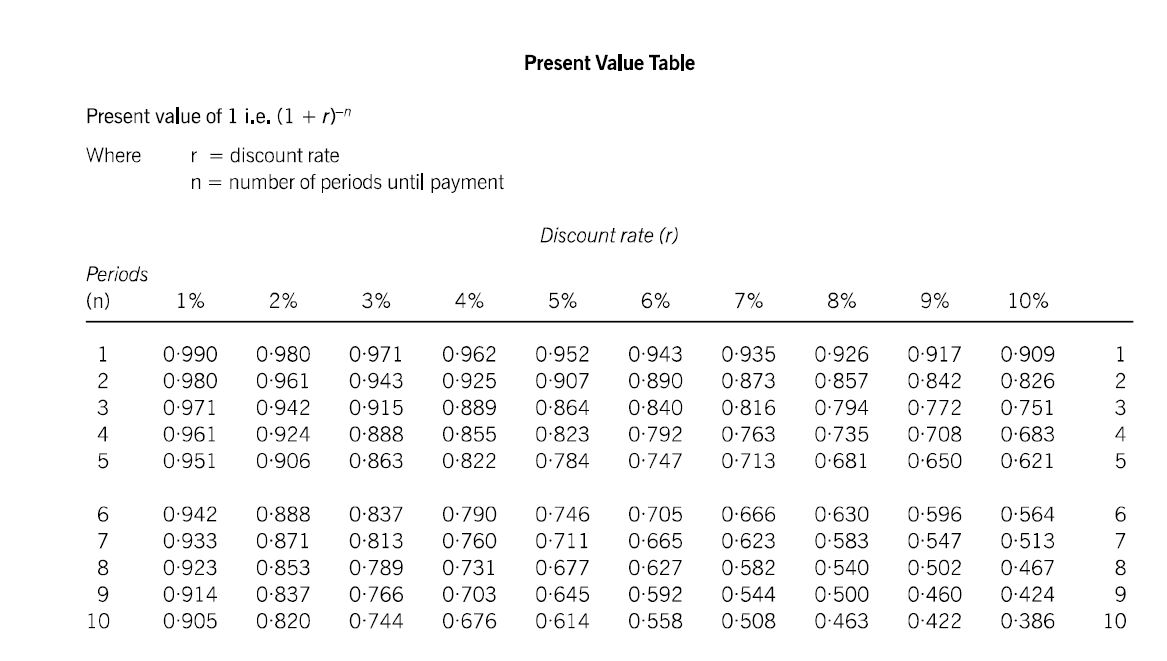
1. Calculate the break-even point in terms of the number of visitors for the water park. **(4 marks)**
2. The Directors of Thrills and Spills Ltd would like the Water park to achieve a profit of £120,000 per year. Calculate the number of visitors required to achieve the desired profit. **(4 marks)**
3. Explain what is meant by the term “margin of safety” outlining its importance for a business. Calculate the margin of safety in terms of both sales revenue and visitor numbers if the desired profit of £120,000 per year is achieved. **(8 marks)**
4. Suggest how the pricing strategy for the park could be adapted to attract more visitors. **(4 marks)**
5. Explain what is meant by the terms “net present value” and “payback period.”

**(6 marks)**

1. Calculate the net present value and payback period for the surf centre and the scuba diving centre. **(18 marks)**
2. Advise the Directors as to the best use of the new land giving a clear indication of your reasoning. In your answer you should consider the limitations and advantages of the two methods of capital investment appraisal that you have used. **(6 marks)**

**Total 50 marks**

**END OF QUESTION PAPER**

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