



THE UNIVERSITY OF ADELAIDE
DEPARTMENT OF MECHANICAL ENGINEERING
EXAMINATION FOR THE SUBJECT
6393: PROFESSIONAL ENGINEERING PRACTICE
NOVEMBER 1999
TIME: 3 HOURS

- In addition, candidates are allowed ten minutes before the examination begins, to read the paper.
 - Answer **ALL** questions in **PART A** and **ONE ONLY** from **PART B**.
 - Open book examination.
 - Calculators may be used.
 - Please note marks value of each question and allocate your time accordingly.
 - **Total marks for exam paper out of 80**
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PART A

QUESTION 1

Briefly describe the typical activities that are undertaken during each of the 4 phrases of a project's life cycle.

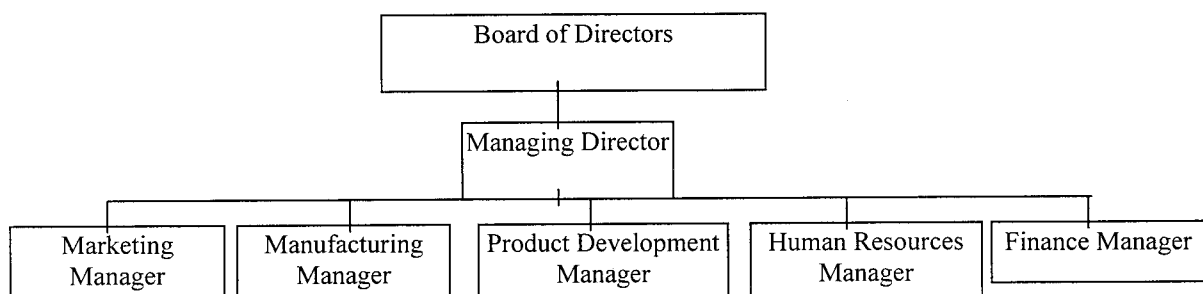
(15 marks)

The following information relates to both questions 2 and 3

You have been appointed as Product Development Manager for "Step Safe Ladders Ltd".

The company started in business over seventy years ago and the Step Safe brand is a household word in Australia.

The Product Development Department currently consists of yourself as manager, three qualified mechanical engineers, two CAD draftspersons, and two tradespersons who build prototypes and test new products. You report directly to the Managing Director. The organisation structure for the company is shown below.



The company manufactures, markets and distributes three families of products:

- Domestic ladders for the consumer market
- Professional ladders for use by trades people such as builders, painters, electricians etc.
- Special purpose ladders for use on fire trucks and emergency vehicles

The annual report for the company shows that total sales last year were \$25 million, made up as follows:

- Domestic ladders \$8 million
- Professional ladders \$10 million
- Special purpose ladders \$ 7 million

The company currently has negligible sales outside Australia.

Step Safe used to dominate the market for domestic ladders but due to intensive competition from imports Step Safe now has only 10 percent market share in this segment. The largest competitor has around 30 percent share. Overall, this market segment has seen little growth over recent years. Consumers tend to buy ladders on price. Step Safe have tried continually to cut the manufacturing cost of their domestic product to compete. Even so, their sales and profits in this market segment have continued to fall.

In the professional market, Step Safe ladders are seen to be solid and dependable. Imported competitors have difficulty meeting Australian standards. Trades people are suspicious of the cheaper imports. As a result, Step Safe continues to dominate this segment with some 50 percent market share and healthy profits. The overall market is relatively stable, fluctuating somewhat depending on the level of activity in the building industry.

Step Safe entered the special purpose ladder market when they bought out a small company that manufactured ladders for fire trucks and emergency vehicles. This company had developed a patented extension ladder system that was significantly better than imported products. In the three years since purchasing the company, Step Safe has seen significant growth in this side of the business and has achieved a dominant share of the Australian fire and emergency service ladder market. These special purpose products are quite profitable, however significant investment will continue to be required in product development, marketing and manufacturing to maintain this position.

The Board of Directors of Step Safe are keen to grow the company. They have appointed you specifically to lead the development of new and successful products.

QUESTION 2

- (a) Using the Boston Grid, carry out a portfolio analysis of Step Safe's product range. (5 marks)
- (b) Describe the options for growth that Step Safe could consider and evaluate these options. (5 marks)
- (c) Brainstorm five new products that Step Safe could reasonably consider to add to their product range, and evaluate each of these product ideas. (5 marks)
- (d) Write your recommendations to the Managing Director on the future product range and markets that Step Safe should focus upon. (5 marks)
- (e) Write a mission statement that clearly defines the future business of Step Safe, in accordance with your recommendations. What will be the sustainable competitive advantage of Step Safe in the future? (5 marks)

Clearly state any assumptions you make in answering this question.

QUESTION 3

- (a) As Product Development Manager at Step Safe Ladders Ltd, what role can you play in securing the future success of the company? (5 marks)
- (b) What are the principal areas in which you will need to co-operate with the other senior managers in the company? (5 marks)
- (c) How might you best organise the Product Development process within Step Safe Ladders Ltd? (5 marks)
- (d) What should be the principal measures by which your success as Product Development Manager should be measured? (5 marks)
- (e) What will be the critical factors that may affect your success as Product Development Manager? (5 marks)

Clearly state any assumptions you make in answering this question.

PART B

QUESTION 4

Respond to **ONE ONLY** of the following:

- (a) What are the characteristics of entrepreneurial management? (15 marks)

OR:

- (b) As a manager what strategies would you implement to promote a climate in your organisation that supported entrepreneurial and innovative behaviours? (15 marks)

TOTAL MARKS FOR EXAM PAPER = 80