

**MNE3703**

May/June 2014

**INNOVATION AND TECHNOLOGY**

Duration : 2 Hours

70 Marks

**EXAMINERS :**

FIRST :

MR NH MANCHIDI

SECOND :

DR D VISSER

EXTERNAL :

PROF M PRETORIUS

Use of a non-programmable pocket calculator is permissible.

Closed book examination.

This examination question paper remains the property of the University of South Africa and may not be removed from the examination venue.

The paper consists of 5 pages

You may answer this examination paper in either English or Afrikaans.

Make sure that the following information appears on the cover of your answer book:

- Your **student number**
- The **module code (MNE3703)**
- The **sections and the numbers** of the questions you have answered

**Section A** is a **compulsory** section which you have to answer.

In **Section B** you must answer any **two (2)** of the three (3) questions.

Answer the questions in the answer book provided to you.

Please indicate the section and number of the question clearly when answering.

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**SECTION A**

The completion of this section is compulsory.  
Answer all the questions of 30 marks in this section.

**QUESTION 1 (COMPULSORY)**

The questions for this section relates to the case study below.

**The Predator**

Craig Johnston is an Australian from Lake Macquarie in New South Wales. He was a keen soccer player as a child, encouraged by his father who had been a professional footballer. Craig too followed in his father's footsteps and in 1986 achieved a childhood ambition when he scored one of the winning goals for Liverpool in the 1986 Football Association (FA) Cup Final. However, two years later Johnston quit the game and returned to Australia.

In retirement Johnston coached the Lake Macquarie junior team. Coaching children, Johnston came to realise how difficult ball control was for youngsters. He began to think about the idea of a new type of football boot that would perform better than existing boots. A call from fellow Australian, Harold Hunter, who had been experimenting with high friction surfaces for football boots to give a better grip, set Johnston on the path to innovation. Hunter's experimental boot incorporated a serrated plastic surface and while it did give better grip Johnston realised its sheer bulk made it too cumbersome. Johnston found the solution while windsurfing. Having borrowed a pair of windsurfing shoes, he quickly realised that they were light yet provided excellent grip in the wet. Lightness was achieved by using one-piece mouldings utilising thermoplastic rubber.

Johnston was determined to find out more about windsurfing shoes and while in Europe for the 1990 World Cup he visited a French company, Okespor, one of the leading manufacturers of specialist sporting footwear for sports such as windsurfing, golf and ice-skating. Johnston met with Okespor director, Roger Ours. Impressed by what Okespor was doing, Johnston commissioned the company to make a prototype soccer boot. The boot would utilise the same thermoplastic as the windsurfing shoe to provide grip in the wet, but with a flattened top to give a larger area of contact with the ball. The new design was actually based on a modified golf shoe and development of the prototype cost Johnston £15 000.

Testing the boot against a wall outside the Okespor factory in Paris, Johnston found it provided much improved control but with only modest improvement in grip. To improve grip Johnston etched grooves into the boot to improve grip in the manner of a car tyre. The result was improved grip but at the expense of reduced control! Johnston experimented further, but even after three or four months' effort he had made little improvement.

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Then one day while visiting a children's toy store the idea came to him to use the same rubber as used for toy "superballs" which have a very high rebound capability.

Johnston bought some superballs and tried attaching pieces from them to the boot. The result was a dramatic improvement in performance.

A specialist rubber consultancy advised Johnston on how to obtain the rebound capability he required and a low rate of wear by vulcanising the rubber. However, injection moulding a boot had proved prohibitively expensive to develop further, so Johnston devised a flat mould incorporating the same fins as before but which could easily be vulcanised.

One cold winter's day Johnston tried the new boot against the wall of a tennis club in Paris. He was delighted and got a young player from the Paris St Germain team to try the new boot. Johnston was convinced that the new boot gave a player's shot greater power and greater accuracy.

However, by now he had spent £250 000 of his own money and having patented his final design, he decided to get someone else to make it. He approached the sports footwear manufacturer Adidas in Nuremberg. At first sceptical, their scientists agreed to test the boot and compare it with their conventional leather boots. A few weeks later he was summonsed to hear the results of the tests. Although he was tense at the prospect of having his design rejected, Johnston need not have worried as Adidas' scientists gave him a standing ovation when they announced the results. Adidas offered Johnston a deal whereby he could work with their designers to produce a marketable product. Adidas called the new boot the Predator. Launched in 1994, two years later more than a million pairs had been sold, and by 2004 it was the world's best-selling football boot. (Source: Smith, 2010: 94-95).

#### About Adidas Football

"Over the last 40 years, Adidas and Federation of International Football Association (FIFA) have worked closely together to develop football worldwide. Therefore, it was a natural step for us to extend one of the most successful partnerships in the history of sports marketing," said Herbert Hainer, Chief Executive Officer (CEO) of the Adidas Group. "We are happy and proud that our close relationship with FIFA will continue. This unique partnership and our extensive presence at all FIFA World Cups will help us to expand Adidas' position as the leading football brand worldwide."

Adidas is the global leader in football. It is the Official Partner of the most important football tournaments in the world, such as the FIFA World Cup, the FIFA Confederations Cup, the Union of European Football Association (UEFA) Champions League, the UEFA Europa League and the UEFA European Championships. Adidas also sponsors some of the world's top clubs, including Real Madrid, Football Club Bayern Munich, AC Milan, Flamengo, PFK ZSKA Moscow and Chelsea Football Club

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Some of the world's best players also on the Adidas roster are Leo Messi, Gareth Bale, Mesut Ozil, Dani Alves, Oscar, Xavi, Karim Benzema, Alexandr Kerzhakov, Denis Glushakov and Bastian Schweinsteiger.

(Source: Adidas Website [<http://www.adidas-group.com/en/media/news-archive/press-releases/2013/adidas-and-fifa-extend-partnership-until-2030/>]).

- 1.1 Explain the Rothwell (1994) innovation process that Johnston followed by using the four (4) phases of the demand pull process as a framework. Use appropriate extracts from the case study in your answer. (8)
  - 1.2 Provide four (4) reasons why Adidas was a good choice for Johnston's external route to innovation. Motivate each reason with an appropriate fact from the case study. (8)
  - 1.3 The case study provides extracts to illustrate that innovation is expensive. Describe three (3) particular factors according to O'Sullivan that make innovation expensive. (6)
  - 1.4 The resilience of the individual inventor is linked to a number of factors. Briefly outline the three (3) factors to which the resilience of the individual inventor is linked to. (6)
  - 1.5 Describe two (2) benefits a patent holder may receive by registering a patent. (2)
- [30]**

## SECTION B

You may choose to answer any **two (2)** of the following three (3) questions of 20 marks each in this section.

### QUESTION 2

- 2.1 The innovation process consists of three stages, namely invention, commercialisation and diffusion. Explain the nature and importance of diffusion with regards to the process and success of innovations (4)
  - 2.2 The construction of models and prototypes are central to the development stage of the innovation process. Discuss four (4) functions of prototypes that contribute to the innovation process. (4)
  - 2.3 In general, organisations with a strong record of innovation will have a corporate culture that is valued and promoted. Describe any three (3) characteristics that are valued and promoted by the culture of organisations with a strong record of innovation. (6)
  - 2.4 Provide six (6) benefits of a side-entrance strategy. (6)
- [20]**

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**QUESTION 3**

- 3.1 Describe eight (8) potential benefits of a first-mover strategy to the “first-mover”. (8)
- 3.2 Discuss ways in which “dominant designs” could arise in the market (6)
- 3.3 Explain the contribution of business angels to the innovation process. (6)  
[20]

**QUESTION 4**

- 4.1 Explain how the innovation technology strategy and decisions employed by managers of an organisation is affected by “sunk costs”. (8)
- 4.2 Describe the benefits and features of an “open innovation” strategy. (6)
- 4.3 Discuss the importance for innovators when managing the cash flow gap with regards to the impact of the cash flow on the innovation process and the success of the innovation (6)  
[20]
- TOTAL MARKS:** [70]