

Design technology
Higher level
Paper 3

Friday 13 May 2016 (morning)

Candidate session number

1 hour 30 minutes

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Instructions to candidates

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Answer all of the questions.
- Write your answers in the boxes provided.
- A calculator is required for this paper.
- The maximum mark for this examination paper is **[40 marks]**.



Section A

Answer **all** questions.

1. **Figure 1** shows the Fabsie self-assembly stool manufactured from timber.

Figure 1: A Fabsie self-assembly stool manufactured from timber



[Source: <http://www.timbertail.com>]

Fabsie is an organization that has developed a production system that integrates consumers into the design and manufacture of products. Designers upload their three-dimensional computer-aided design (CAD) files of self-assembly furniture to a website. Customers can choose a product and customize it.

The customized design is then sent electronically to be manufactured close to the consumer and made using computer numerical control (CNC) machinery. These companies are part of a global network of manufacturers.

Customers pay Fabsie and either collect the finished product from the local manufacturer or have it sent to them. Fabsie pays the designer and manufacturer for their services and retains a percentage of the sale price.



- (a) List **two** ways in which the just-in-time (JIT) nature of the Fabsie production system contributes to the cost-effectiveness of the production.

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- (b) Outline how the sustainable design demonstrated by the Fabsie self-assembly stool meets Datschefski's social principle.

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- (c) Outline why the Fabsie production system would have resulted from a top-down strategy.

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(Question 1 continued)

- (d) Explain how the Fabsie production system satisfies the principles of sustainable consumption.

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2. **Figure 2** shows the interior of part of the British Broadcasting Corporation’s (BBC) UK northern headquarters which features thought wheels as meeting areas.

Figure 2: Thought wheel meeting areas



- (a) Outline how the design of the thought wheel impacts on the nature of meetings between colleagues.

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- (b) Outline which aspect of the four-pleasure framework the thought wheel satisfies.

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(Question 2 continued)

(c) Outline why user-centered design (UCD) teams are usually multi-disciplinary. [2]

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(d) Explain how the use of focus groups could assist the design team of the thought wheel. [4]

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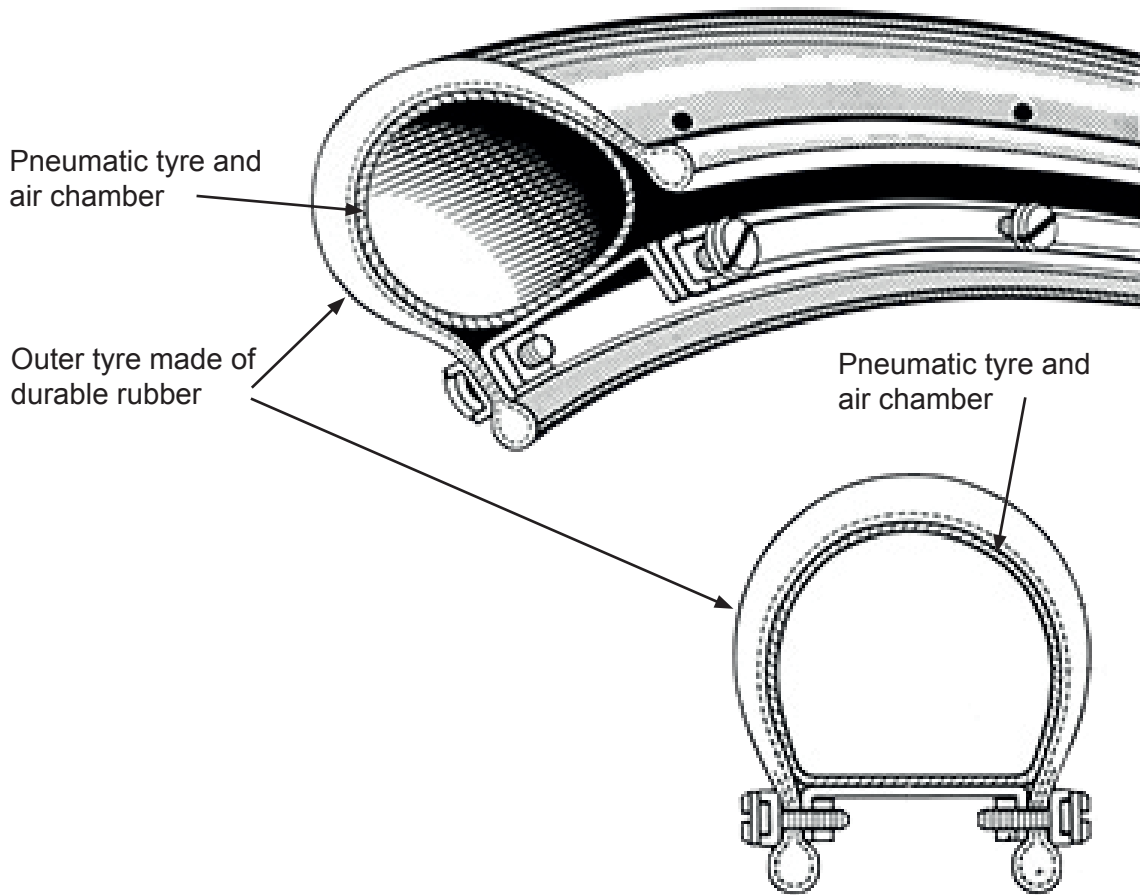
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Section B

3. Read the case study. Answer the following question.

In 1889, Édouard Michelin took over a company that made farm machinery and rubber balls and renamed it Michelin et Cie. After a chance meeting with a cyclist, he developed the first pneumatic (air-filled) bicycle tyre (see **Figure 3** below), which was used in a long distance race in 1891.

Figure 3: 1891 Michelin pneumatic bicycle tyre



[Source: www.michelin.com]

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(Question 3 continued)

Following the success of this tyre, Michelin developed a pneumatic tyre for a car that was used in the Paris–Bordeaux–Paris race of 1895.

Although the newly patented tyres were perceived as a major development, the market for them was very small as there were few motorists on the road.

In 1900 the Michelin brothers decided to promote the excitement and romance of travel by car by producing travel guides and maps. The guides contained information on places to visit, obtain fuel, accommodation and good food. The guides were given away for free and quickly became popular.

A further development was the Michelin star (*) rating which grades restaurants with one, two or three stars based on the standard of food from very good to outstanding. A Michelin star is very difficult to achieve and is highly prized by restaurants around the world.

The Michelin Man (**Figure 5**) is one of the world's oldest trademarks, originating in 1898, and has evolved over time.

Today, Michelin produces 10 million maps and guides each year which are sold in 170 countries. Michelin also spends in excess of \$700 million each year on research and development (R&D), employing 6 000 people in this area alone.

Figure 4 shows an illustration of the Michelin brothers gaining inspiration for the Michelin Man trademark from a stack of tyres in 1898. **Figure 5** shows the Michelin Man (Bibendum) trademark.

Figure 4: The Michelin brothers gaining inspiration for the Michelin Man trademark from a stack of tyres in 1898



[Source: www.michelin.com]

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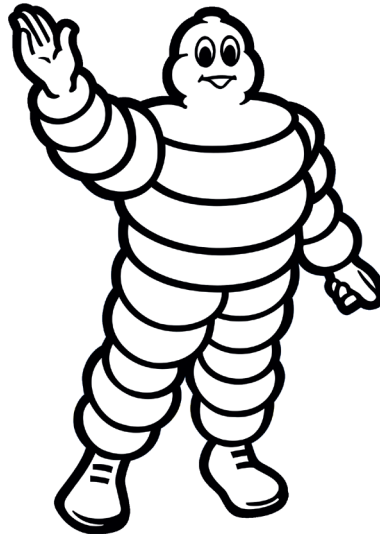


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(Question 3 continued)

Figure 5: Michelin Man (Bibendum) trademark



[Source: www.fastdecals.com]

- (a) Outline one reason why research and development is so important to Michelin in today's market.

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- (b) Outline how the Michelin star system for restaurants impacts on the company's brand for tyres.

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(Question 3 continued)

- (c) Describe how Michelin's target market has changed over the past 150 years. [2]

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- (d) Explain how the Michelin Man trademark has helped the Michelin tyre company maintain brand identity. [5]

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