

MET3
MANUFACTURING ENGINEERING TRIPOS PART IIB

Thursday 24 April 2014

9 to 12

PAPER 2

*Answer not more than **four** questions.*

*Answer **each** question in a separate booklet.*

All questions carry the same percentage of marks.

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

Write your candidate number not your name on the coversheet.

STATIONERY REQUIREMENTS

8 page answer booklet x 4

Rough work pad

SPECIAL REQUIREMENTS

Engineering Data Book

CUED approved calculator allowed

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

1 You are a civil servant in the Department for Business, Innovation and Skills and have been tasked by your Minister with preparing guidelines to inform public investments in manufacturing industries.

- (a) What sources would you use in preparing your advice and why? [30%]
- (b) How might your advice be presented and why? [30%]
- (c) What factors might influence the reliability of your advice? [40%]

2 (a) The current industrial system is dominated by a linear material flow that extracts materials, manufactures end products across various factories and processes, sells the products, uses the products, and then disposes of them. Explain four specific external forces that are seen to limit the long-term future of this linear system. [20%]

(b) Explain how a *Circular Economy* works to change the linear material flow system. Describe three potential impacts on the manufacturing stages of the system. [40%]

(c) New business models are argued to be an essential part of a transformation to a *Circular Economy* through internalising value. Define *internalising value* and explain how this can lead to a more sustainable industrial system that improves both environmental and economic performance. [20%]

(d) Give two specific examples of innovative business models, explaining their novelty, how they *internalise value*, and the planned or actual benefits achieved. [20%]

3 The Chief Executive Office (CEO) of a small technology start-up is considering disciplinary action and immediate dismissal of an employee for having a consistently poor attendance record.

(a) Discuss potential issues the company might face if it goes ahead with the immediate dismissal. [40%]

(b) Describe the steps the company should take before allowing the dismissal to go ahead. [60%]

4 “In many industries and sectors, innovation is an increasingly distributed process, involving networks of geographically dispersed players with a variety of possible value chain configurations”. Discuss why this is happening and the resulting implications for companies. [100%]

5 (a) Sketch and describe what is meant by:

- (i) a technology ‘S-curve’;
- (ii) a technology adoption curve; and
- (iii) a product life cycle.

Illustrate your answers with examples. [45%]

(b) Discuss how connections among the concepts in part (a) could be used to develop and implement a strategy for the launch of a product based upon a novel technology. [55%]

6 (a) In the context of a manufacturing business which designs, produces and sells a mass market family car, explain what is meant by the:

- (i) manufacturing strategy;
- (ii) marketing strategy; and
- (iii) brand identity. [60%]

(b) Discuss how manufacturing strategy, marketing strategy, and brand identity may be integrated to be part of a coherent business strategy. [20%]

(c) Discuss why and how brand identity may evolve over time, illustrating your answer with examples from the Fast Moving Consumer Goods (FMCG) industry. [20%]

END OF PAPER