

MANUFACTURING ENGINEERING TRIPOS PART II

Thursday 24 April 2003

9 to 12

Paper 2

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

All questions carry the same number of marks.

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

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

1 You have just been appointed Technical Director of a medium sized company (400 employees) which designs and manufactures electronic toys. This is a fast moving, fashion-oriented sector. In order to be successful, firms must stay abreast of both consumer trends and technological developments, and manufacture competitively. The recent performance of the firm regarding the introduction of new products to the market place has been poor. Only a few new products have been developed, and these have been many months late with their launch in the market place. You observe that the new product introduction (npi) process is ad hoc, with no consistency of approach or allocation of responsibility.

(a) How might the innovative capacity of the company be stimulated? [5]

(b) You consider the introduction of a new product introduction process based on a stage-gate method. Discuss its features and relevance, method of operation and potential benefits. [12]

(c) For the longer term, discuss the potential advantages and limitations of technology roadmapping as a technique to facilitate product planning. [8]

2 Your company, a successful, medium sized manufacturer of specialist high-tech capital products, is launching a new product in 6 months time.

(a) The company has recently appointed a new Marketing Director whose background is in consumer markets.

(i) What differences will the new Marketing Director notice between the nature of consumer buying and corporate buying behaviour? [5]

(ii) What changes is he likely to observe in buyer behaviour as his product and the market for it mature? [6]

(cont.)

(b) The company's product area is automated product identification. The core technology of the new product is a low-cost radio frequency label that can be attached to goods in shops and read automatically at the check-out, eliminating the need for human check-out staff.

(i) What is meant by the terms technology lifecycle, sustaining technology and disruptive technology? [6]

(ii) What technical and business issues will the Marketing Director's company face as the core technology is introduced and matures? [8]

3 (a) Why do multinational corporations (MNCs) need to set up manufacturing operations in foreign countries? [7]

(b) What are key differences between the traditional European international business model and the current global business model? [10]

(c) What new challenges are manufacturing managers facing in the emerging global manufacturing environment? [8]

4 (a) What human resource problems tend to arise as a new company moves from an entrepreneurial form of organization to a professionally managed organization and why does this transition often create difficulties? Provide examples to support your account. [10]

(b) Can the problems associated with rapid growth in a new technology-based company be anticipated and averted? Provide examples to support your account. [15]

- 5 (a) What are the main aims and characteristics of lean production techniques in manufacturing? [4]
- (b) Explain how such techniques contribute to high levels of productivity. [5]
- (c) Discuss the problems that might face operators who work under lean production systems. [7]
- (d) Describe particular measures that can be taken to minimise the adverse impact of working conditions associated with lean production. [6]
- (e) What are some of the assumptions on which the rationale for lean production depends? [3]
- 6 (a) Define and discuss the concept of 'manufacturing strategy'. [10]
- (b) Discuss the way in which you would design a performance measurement system to both monitor and encourage the implementation of a manufacturing strategy. [15]
- 7 An integrated supply chain is defined as an association of customers and suppliers who work together to optimise their collective performance in the creation, distribution and support of an end product.
- (a) Set out the arguments for and against a company integrating its network of supply chains more closely, focusing on the company's dealings with its suppliers. Wherever possible, illustrate your answer with examples. [15]
- (b) Do you believe that closer integration benefits the company and its suppliers equally? Explain your reasoning. [10]

8 The management team of a precision engineering machinery company is concerned about a number of aspects of the company's performance. You have been asked to make a business assessment visit to the main site. The production manager has allocated a morning to show you around and answer questions.

- (a) How would you conduct your investigation? [7]
- (b) What metrics would you wish to review and what would you expect to learn from them? [7]
- (c) Perceived problems include scheduling, missed delivery dates, quality and cost, as causes of revenue loss. Discuss the significance of other issues that you would want to investigate in order to understand the cause of the company's problems. [7]
- (d) What can be done during and after the development and presentation of your recommendations to improve their chances of being implemented? [4]

END OF PAPER