



**UNIVERSITI TUN HUSSEIN ONN  
MALAYSIA**

**FINAL EXAMINATION  
SEMESTER I  
SESSION 2009/2010**

SUBJECT NAME : CONCURRENT AND REVERSE  
ENGINEERING

SUBJECT CODE : BDD 4053

COURSE : 4 BDD

EXAMINATION DATE : NOVEMBER 2009

DURATION : 2 HOURS 30 MINUTES

INSTRUCTION : ANSWER **FOUR (4)** OUT OF  
**SIX (6)** QUESTIONS

THIS EXAMINATION PAPER CONTAINS FOUR (4) PAGES

- Q1**
- a) Explain the importance of effective communication during the implementation of Concurrent Engineering. (5 marks)
  - b) How can 'shortened lead time' make a company more competitive? (5 marks)
  - c) The Japanese quality strategy put more extensive efforts during product development period compared to the American way which devote less effort during product development but improvise the products in stages even after manufacturing process starts. In your opinion, which style is more advantageous, and why? (5 marks)
  - d) Describe the importance of diversity in cross-functional teamwork for Concurrent Engineering. (5 marks)
  - e) What is QFD? Briefly explain the **FOUR (4)** phases of QFD. (5 marks)
- Q2**
- a)
    - i. Sketch the Product Life Cycle plot.
    - ii. Explain in detail the characteristics of each stage including how the management team must respond to the product life cycle in terms of changes in promotion, pricing, product distribution, and the product itself.
    - iii. Identify in which stage the following products are within the life cycle: a check book, a credit card, a portable DVD player, and an iris-based personal identity card. (10 marks)
  - b) Define 'Robustness' in product design. How is the robust design method carried out? (5 marks)
  - c) How does Group Technology work? (5 marks)
  - d) Briefly describe the Failure Modes and Effects Analysis (FMEA). (5 marks)

- Q3**
- a) List **SIX (6)** criteria that need to be taken into consideration in selecting the right vendor. (6 marks)
  - b) What are the main reasons of maintaining a short-listed vendor list? (4 marks)
  - c) Describe the importance of video conferencing and internet communication to assist a company? (5 marks)
  - d) Explain what is meant by benchmarking or benchmark test in relation to vendor selection. (5 marks)
  - e) Discuss the use of STEP in Data Exchange Procedure. (5 marks)
- Q4**
- a) List **TEN (10)** reasons for using Reverse Engineering. (10 marks)
  - b) Reverse Engineering can also result in Value Engineering. How can Value Engineering be implemented in Reverse Engineering? (5 marks)
  - c) Reverse Engineering operations involve four main phases: points and images, polygon, curves, and NURBS surfaces. Describe the activities involve in each one of the phases. (10 marks)
- Q5**
- a)
    - i. Define Rapid Prototyping.
    - ii. How is it applied in Reverse Engineering?
    - iii. List **FIVE (5)** Rapid Prototyping techniques. (10 marks)
  - b) What is the purpose of the Economic and Engineering Report used in the Reverse Engineering effort? (5 marks)
  - c) Why is it necessary to have approvals at each stage of the reverse engineering process including a final approval before the project is executed? (5 marks)

- d) Distinguish between Reverse Engineering and Forward Engineering.  
(5 marks)

- Q6** a) Elaborate in detail how Reverse Engineering is applied in the quality control of a product.  
(10 marks)

- b) i. Compare the available methods of digitizing used in measuring the dimensions of a product.  
ii. List the advantages and disadvantages of contact digitizers and non-contact digitizers.  
iii. Name **THREE (3)** available measuring systems designed to nondestructively scan the internal parts of products or internal organs in medical applications.  
(10 marks)

- c) Discuss the way Reverse Engineering can be applied in teeth replacement in dental application focusing on the related issues. Provide relevant sketches.  
(5 marks)