

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF INDUSTRIAL TECHNOLOGY
DEPARTMENT OF INDUSTRIAL AND MANUFACTURING ENGINEERING
BACHELOR IN ENGINEERING INDUSTRIAL AND MANUFACTURING
ENGINEERING
CONCURRENT ENGINEERING - TIE 3119
1st SEMESTER EXAMINATION - APRIL 2009

Instructions to Candidates

1. Time allowed 3 hours
2. Answer any 4 Questions
3. All questions carry 25marks each.

Question 1

- (a) Define concurrent engineering and outline its strengths [10]
- (b) Explain the Manufacturability System model in concurrent engineering. [10]
- (c) What are the major benefits of a well defined product development process? [5]

Question 2

- (a) Demonstrate that Quality Function Deployment QFD is a tool for concurrent engineering. [1]
- (b) What is a Mission statement in product design and how does it help the process? [4]
- (c) Your company has won a tender to develop a product for use during the Olympics Using Quality Function Deployment (QFD), develop the house of quality for a sports bicycle [20]

Question 3

- (a) When generating a concept for a problem, what common dysfunctions do development teams face? [5]
- (b) Explain the 5 step concept generation methodology and fully explain each step using an example of a problem of your choice. [15]
- (c) Explain the purpose of the concept combination table. [5]

Question 4

- (a) What do you understand by the term Product architecture and distinguish between Modular architecture and Integral architecture. [6]
- (b) How does modularity impact on the business of your enterprise in terms of.
 - i. Product change, [3]
 - ii. Product variety, [3]
 - iii. Product performance and Manufacturability? [3]
- (c) Explain the effects of the Management of the Industrial design process using both Technology-driven products and User driven products. [10]

Question 5

- (a) What are the 5 phases of the Production development process? [5]
- (b) How does the use of teamwork impact product development? [4]
- (c) Explain by use of a diagram the Pahl and Beitz phase model of product development. [12]
- (d) What is rapid prototyping and how is it useful in concurrent engineering? [4]

End of Exam