

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF INDUSTRIAL TECHNOLOGY

DEPARTMENT OF INDUSTRIAL AND MANUFACTURING ENGINEERING

Bachelor of Engineering (Honours) Degree in Industrial and Manufacturing Engineering

Concurrent Engineering – TIE 3119

FIRST SEMESTER EXAMINATIONS - FEBRUARY 2010

Time allowed: 3 hours

Instructions: Answer FOUR (4) questions.

QUESTION 1

- a) What is product architecture? [5]
- b) Explain the implications of product architecture, giving examples. [10]
- c) How does the modularity of a product affect its manufacturability? [5]
- c) Explain the steps taken to come up with product architecture. [5]

QUESTION 2

- a) What is the role of concurrent engineering in the global competition? [5]
- b) What are the characteristics of a competitive product? [5]
- c) How are Zimbabwean companies prepared for the global competition? What should they do to improve their position in the global competition? [10]
- d) Explain the role of research and development, giving examples. [5]

QUESTION 3

- a) What are the five phases of the production development process? [5]
- b) Besides the market pull products, describe the other variant types of products available, giving examples. [10]
- c) Explain the difference between the two types of models developed in the product testing and refinement stage of the generic product development process. [5]
- d) To what extent is concurrent engineering applicable to the manufacturing industry in Zimbabwe? [5]

QUESTION 3

- a) Your company has won a tender to develop scotch carts for the Farm Mechanisation programme. Using Quality Function Deployment (QFD), develop the house of quality for a scotch cart. [20]
- b) What are the limitations of using the Quality Deployment Function method in concept development [5]

QUESTION 4

- a) What do you understand by problem decomposition with respect to the concept generation methodology? [5]
- b) Use the problem decomposition approach to clarify the problem in designing a new coffee or tea maker. [10]

- c) Companies in Zimbabwe can improve their products by properly following the five step “concept generation methodology.” Discuss the suggestion, explaining where companies in Zimbabwe are failing, giving examples and how they can address the problem. [10]

QUESTION 5

- a) What are the benefits of a structured concept selection methodology? [5]
b) Discuss the concept screening methodology using a product of your own choice. [12]
c) What are the prospects for the computer support of concept selection activities in Zimbabwe? [8]

QUESTION 6

- a) What do you understand by the term ‘Product architecture’? Distinguish between ‘Modular architecture’ and ‘Integral architecture’. [5]
b) Discuss the importance of industrial design to products and how it can improve products manufactured in Zimbabwe. [10]
c) Your company decides to put labels inscribed “Proudly Zimbabwean” for the export market. Explain how you would use knowledge gained in management of the Industrial design process to advice your company on the products they can manufacture. [10]

END OF EXAM