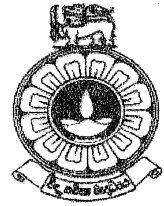


THE OPEN UNIVERSITY OF SRI LANKA**FACULTY OF ENGINEERING TECHNOLOGY****DIPLOMA IN TECHNOLOGY – LEVEL 03****FINAL EXAMINATION – 2007****MEX3174 – PRINCIPLES OF DESIGN****DATE : APRIL 22, 2008****TIME : 0930 HRS. – 1230 HRS****DURATION : THREE HOURS**

PLEASE READ THE FOLLOWING INSTRUCTIONS BEFORE ANSWERING THE PAPER

INSTRUCTIONS:

1. *This paper consists of eight questions. Answer any five questions only.*
2. *Each question carries marks as indicated amount in the question.*
3. *Answers should be written on the answer books provided by the Examinations Division.*

Question 01

- (1.1) *Many individuals have put forward definitions for 'engineering design'. Explain how all these definitions construe the same result. (06 marks)*
- (1.2) *Identify an item which you are familiar with and briefly explain its evolution over the past years. (06 marks)*
- (1.3) *In the history, there has not been any exclusive or easily recognizable class of persons regarded as "designers". Many complex, beautiful, functional and civilizing artifacts have been created without consciously designing them. Elaborate on the statement. (08 marks)*

(Cont...)

Question 02

- (2.1) Briefly explain the major differences in traditional design approaches and modern design approaches when designing a product? (08 marks)
- (2.2) Explain with examples the main categories of engineering design. (07 marks)
- (2.3) *History shows that in the process of evolution of design, the design office had emerged.* Identify the activities that take place in a design office. (05 marks)

Question 03

- (3.1) Explain why economics play an important role in the subject of engineering design. Elaborate on your answer by giving suitable examples. (08 marks)
- (3.2) *Some products and designs have staying power while others disappear overnight.* Comment on the above statement drawing suitable examples appropriately. (05 marks)
- (3.3) Explain the characteristics of technology in terms of 'complexity', 'dependency', 'valance' and 'scale'. (07 marks)

Question 04

- (4.1) Quote an example to demonstrate how technology can change the society and its values. (08 marks)
- (4.2) Explain the influence of a society in engineering design. (06 marks)
- (4.3) Explain the consequences of *factor of ignorance* on engineering design. (06marks)

Question 05

- (5.1) Distinguish between a 'Holistic design approach' and a 'Collaborative design approach'. (08 marks)
- (5.2) Briefly explain at least four (4) factors to be considered in holistic design approach. (07 marks)
- (5.3) Define the term 'Ergonomics' and discuss its relevance in engineering design. (05 marks)

(Cont...)

Question 06

- (6.1) What are the features of sustainable consumption system? (07 marks)
- (6.2) Explain the methods of promoting sustainable consumption and production. (07 marks)
- (6.3) Explain the main objective of Life Cycle Assessment (LCA) of a product and its key elements. (06marks)

Question 07

- (7.1) Explain briefly the methods available (at least four) for exploring information in order to identify and define a given problem. (06 marks)
- (7.2) Brainstorming is said to promote creativity in the designing process. Comment on the above statement. (06 marks)
- (7.3) Define the term “Synectics” and explain how it differs from brainstorming. (08 marks)

Question 08

- (8.1) Explain the objectives of functional analysis method. (07 marks)
- (8.2) *Black box representation is often used in functional analysis method.* In black box representation, explain the significance of defining the overall function as broad as possible at the initial stages of design. (07 marks)
- (8.3) Discuss the major steps involved in black box representation method. You may take an example to explain your answer. (06 marks)