THE OPEN UNIVERSITY OF SRI LANKA
FACULTY OF ENGINEERING TECHNOLOGY

DIPLOMA IN TECHNOLOGY – LEVEL 3
FINAL EXAMINATION – 2006/2007

MEX3174 – PRINCIPLES OF DESIGN

DATE: March 7, 2007 TIME: From 09-30 am to 12.30 pm 050
DURATION: THREE HOURS

ANSWER ANY FIVE (05) QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS

Question 1

a) Write a definition for Engineering Design. [5 marks]

b) Draw a suitable flow chart to illustrate a model of the design process. [5 marks]

c) Briefly explain the activities involved in each stage with reference to the flow chart. [10 marks]

Question 2

a) What are the different methods available for exploring information in order to identify and define a given problem? [8 marks]

b) What role can the computer play in the design process? [7 marks]

c) Why is "customer" an important person in designing a product? [5 marks]

Question 3

a) The use of traditional fountain pen is disappearing, and its place is taken over by ball pens with ink cartridges. Identify possible reasons for this change. [8 marks]

b) With suitable examples, explain how the culture of a society may influence design of a product. [5 marks]

c) Engineering design can be considered as an interface with society, economy and technology. Briefly explain. [7 marks]

Question 4

a) Identify the factors to be considered in holistic design process. [6 marks]

b) Select any product and list its embedded features against the factors that you have identified above. [8 marks]

c) What is collaborative design and why is collaborative approach important in engineering design? [6 marks]

Question 5

a) What is the Life Cycle of a product? State its different stages. [7 marks]

b) What are the resulting consequences if Life Cycle is overlooked during the design stage? [5 marks]

c) What are the key elements in a Life Cycle Assessment (LCA) and the areas that each key element covers? [8 marks]

Question 6

a) Consider a table lamp as a product to be designed. List the user needs to be taken into account in the concept phase of the design process. [8 marks]

b) Sketch two different alternatives of conceptual designs for the table lamp and evaluate the two alternatives against the needs. You may use the format of the table given below to present your answer. [12 marks]

	Need	Alternatives	
		A	B
1			
2			
3			

Question 7

a) What is the generic black box model in product design? [5 marks]

b) Identify the inputs and outputs of the black box model and explain how the inputs and outputs are related. [8 marks]

c) How would you consider the design parameters of a fingernail clipper in relation to the black box model? [7 marks]