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THE OPEN UNIVERSITY OF SRI LANKA

FACULTY OF ENGINEERING TECHNOLOGY

DIPLOMA IN TECHNOLOGY - LEVEL 03

FINAL EXAMINATION – 2009/10

MEX3174 – PRINCIPLES OF DESIGN

MEX2132 – DESIGN PHILOSOPHY

DATE : *APRIL 01, 2010*
TIME : *1400 HRS. – 1700 HRS.*
DURATION : *THREE HOURS*

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

Question 01

a. *Evolution of design procedure dates back to several centuries. For our ancestors, design and manufacturing were a part and parcel of their life. But as time went on the design was divorced from manufacturing.*

   Explain the above paragraph, stating clearly the reasons for such an evolution. Distinguish between the methods adopted in the past and that at present in designing and manufacturing artifacts.

b. People have always designed artifacts, and even animals make essential bits and pieces to fulfill basic needs. Distinguish **design by humans** and **design by animals** in the context of evolution and development of the design process. You may quote appropriate examples to support your answer.

Question 02

a. Elaborate the role of an Engineering Designer.

b. As far as the nature of modern design is concerned, efficient communication is essential. The most widely used form of communication is drawings.

   i. Clearly explain why it is essential to have appropriate communication methods in modern manufacturing facility.

   ii. Briefly discuss the usage of drawings in design practice and how drawings can be used in evaluating designs.

Question 03

a. Creative design methods attempt to promote the flow of ideas. **Brainstorming** is the n widely known method to promote creativity. Explain what Brainstorming is.

Note: Your answer should clearly explain the role and the responsibilities of the lea and the other members in a brainstorming session.

b. Following methods used to overcome difficulties in design problems. Describe eacl them and clearly state the instances they used.

Literature searching
Checklists
Questionnaires

Question 04

a. The way and approach of the scientists and engineers solving a problem is different. you agree to this statement? Justify your answer.

b. Given below are several phases of engineering design. They are not arranged in proper sequence.

Evaluation
Synthesis
Definition of the Problem
Presentation
Recognition of need
Analysis
Optimization

Arrange these phases in sequential manner and draw a suitable flow chart incorporat these phases with their interrelationship to show that when the flow chart is followed, design process would result a successful design.

Question 05

Clarifying objectives of a design activity is very important for a designer. Why is it so?

Imagine that you are an engineer, given the task of designing a concrete compaction mach which is used to compact and level concrete roads. List the relative design objectives expand them into sub objectives and arrange them in an objective tree diagram according their importance.

Question 06

Some technological innovations have altered the course of history and greatly influenced in further engineering developments. Explain using an appropriate example for such innovation.

Political factor or factors related to authorities cannot be forgotten in producing and implementing designs. Do you agree, justify your answer.

Explain the term **Design for sustainability**.

Question 07

"Interviewing the user" and "investigating user behavior" are two methods, which can be used to identify external conditions with which the design must be compatible. Explain these methods briefly and state how they benefit to the designer.

You are assigned to design two sets of table and a chair, one to be used by the readers in a university library and other to be used by the customers in a barber saloon.

Distinguish the properties and requirements of the two products paying attention to aspects such as conformability, manuarability, working environments, appearance, mechanical properties, material properties, etc.

Question 08

Answer any three (03) of the following.

Why economic considerations are important in an engineering design and how the economic considerations can change the engineering design process?

Technology can change the society. Explain your opinion using appropriate examples.

Explain clearly a "well-defined problem" and an "ill defined problem".
Note: Your answer should address the respective characteristics in each problem.

Importance of Ergonomic consideration in modern engineering designs.

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