THE OPEN UNIVERSITY OF SRI LANKA

FACULTY OF ENGINEERING TECHNOLOGY
BACHELOR OF TECHNOLOGY – LEVEL 06
FINAL EXAMINATION – 2010

MEX6334 – ADVANCED MANUFACTURING TECHNOLOGY

DATE : ***MARCH 15, 2011***

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.*
2. *You are required to answer any **five questions only**.*
3. *Answers should be written on the answer books provided by the Examinations Division.*
4. *Commence to answer each question on a **fresh page**.*

Question 01

(1.1) Explain in your own words the concept of Computer Integrated Manufacturing (CIM).

(1.2) How does an application of CIM give a manufacturing organization a competitive edge in competing in the global market? Explain.

(1.3) Briefly explain the role of computers in manufacturing industry. Elaborate on your answer by giving suitable examples.

Question 02

(2.1) *CIM can be viewed from different perspectives*. What are the different views of CIM? Explain one of such views.

(2.2) What is meant by Production Activity Control (PAC) system in the context of CIM? Briefly describe its role within a CIM system.

(2.3) *Automatic warehousing plays a vital role in CIM systems*. Discuss the benefits of using such a system over the conventional warehousing system.

Question 03

(3.1) Discuss the criterion that has to be satisfied in order for a manufacturing system to be considered as flexible.

(3.2) *Not all fully automated manufacturing systems and cells can be considered as Flexible Manufacturing Systems (FMS).* Comment on this statement drawing examples for such systems

(3.3) Explain various types of approaches by which the overall efficiency and effectiveness of a FMS could be achieved

Question 04

(4.1) Distinguish concurrent engineering (CE) from sequential engineering in relation to product design.

(4.2) *One of the goals in introducing new trends in design approaches, such as CE is to improve work flow*. Explain.

(4.3) Why is it considered a good practice to follow a bottoms-up approach for concurrent engineering to be successful?

Question 05

(5.1) Explain the meaning of a "turnkey system" in the context of CAD systems. *In some cases turnkey systems may not be the best for a CAD situation*. Explain.

(5.2) Explain how different CAD/CAM systems communicate with each other. List out the components/elements, in such a system.

(5.3) Discuss the potential benefits that solid modeling offers over wire frame modeling. Take a suitable example to illustrate your answer.

Question 06

(6.1) Define the term 'Numerical Control (NC)' machines with respect to conventional machines. State the major differences between NC and CNC machines.

(6.2) Define the term 'Repeatability' as applied to CNC machine tools. List the features to be incorporated in the phase of machine tool design, if repeatability is to be maintained.

(6.3) Explain meaning of Hybrid CNC and Straight CNC. What lead to the development of each of these systems?

Question 07

(7.1) Explain the Fixed zero and the Floating zero coordinate systems in NC machines, indicating advantages and disadvantages one over the other.

(7.2) Discuss the advantages and disadvantages of manual part programming over the computer aided part programming in relation to part programming of CNC machines.

(7.3) Explain the importance of a post processor in the context of CNC programming.

Question 08

Write short notes on any four (04) of the following.

(8.1) AS/RS systems

(8.2) Types of flexibilities in the context of FMS

(8.3) B-representation and C-representation in the context of solid modeling

(8.4) Basic types of robot configurations

(8.5) "Modularity" and "Dexterity" in the context of an Industrial Robot

(8.6) Programming methods in industrial robotics

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