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The Open University of Sri Lanka
Faculty of Engineering Technology
Department of Mechanical Engineering

Study Programme	: Bachelor of Technology Honours in Engineering
Name of the Examination	: Final Examination
Course Code and Title	**: DMX6534 / MEX6234 – Advanced Manufacturing Technology**
Academic Year	: 2017/18
Date	: January 21, 2019
Time	: 0930-1230hrs

General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper consists of **Eight (8)** questions in **Two (2)** pages.
3. Answer any **Five (5)** questions only. All questions carry equal marks.
4. Answer for each question should commence from a new page.
5. This is a Closed Book Test (CBT).
6. Answers should be in clear hand writing.
7. Do not use Red colour pen.

Question 01.

a) Briefly explain the major objectives of new manufacturing organizations.

b) Explain the concept of Computer Integrated Manufacturing (CIM) and three (03) major challenges face by an industry when trying to implement CIM.

c) Briefly discuss the role of computers in modern manufacturing industries.

Question 02.

a) Briefly explain three (03) objectives of Flexible Manufacturing Systems (FMS)

b) Explain how Flexible Manufacturing System (FMS) differs from a Flexible Manufacturing Cell (FMC).

c) What are the various types of layouts used in FMS? Explain them briefly.

Question 03.

a) Briefly discuss four (04) functions within the scope of manufacturing support systems.

b) Describe briefly the important features of an industrial robot. Explain why these features are necessary?

c) Discuss the role of Automated Guided Vehicles (AGV) in the context of FMS

Question 04.

a) Define 'Group Technology (GT)' and discuss its advantages.

b) Briefly explain the main problems associated with manual process planning over Computer Aided Process Planning (CAPP).

c) Briefly discuss three (03) situations where manual labor is preferred over automation.

Question 05.

a) Distinguish Computer Aided manufacturing (CAM) from Computer Integrated Manufacturing (CIM).

b) Briefly explain the basic 3D modelling techniques available in modern CAD/CAM systems.

c) 'Finite Element Analysis (FEA) applications have become a vital component in CAD environment'. Elaborate on this statement by taking suitable examples.

Question 06.

d) Briefly explain the terms numerical control (NC), computer numerical control (CNC), and direct or distributed numerical control (DNC) systems with regard to computer control of machine tools.

e) Discuss four (04) advantages of implementing CNC technology in manufacturing industries.

f) Briefly explain what is Adaptive Control (AC) and it's three (03) the basic functions.

Question 07.

a) Briefly explain the steps involved in designing and manufacturing of a product.

b) Explain how computers and its technologies are employed in the design process of a product as means of achieving productivity.

c) What is concurrent engineering (CE) and discuss its role in CIM.

Question 08.

a) Explain the significance of Reverse Engineering in modern manufacturing environment.
b) Briefly explain the following;
   i) Reasons for development of Rapid prototyping technologies.
   ii) Role of Production Activity Control (PAC).
   iii) Advantages of using Coordinate Measuring Machines (CMM)