The Open University of Sri Lanka
Faculty of Engineering Technology

Study Programme	:	Diploma in Technology/Bachelor of Technology (Engineering)
Name of the Examination	:	Final Examination
Course Code and Title	:	**MEX6334 – ADVANCED MANUFACTURING TECHNOLOGY**
Academic Year	:	2012/13
Date	:	06th August 2013
Time	:	0930 – 1230 Hrs
Duration	:	3 hours

General instructions

1. Read all instructions carefully before answering the questions.
2. This question paper consists of 8 questions. All questions carry equal marks.
3. Answer any 5 questions only.

Q1. (a) Distinguish Manufacturing from Production. Elaborate on your answer by taking suitable examples.

(b) Discuss the evolution stages of automation. Give examples for each stage.

(c) Briefly explain the concept of Computer Integrated Manufacturing (CIM) as means of achieving a competitive edge in the modern manufacturing environment.

Q2. (a) Discuss briefly the need for Flexible Manufacturing Cells (FMC) in modern manufacturing environment. What are the operational elements in a typical FMC?

(b) Explain how a Flexible Manufacturing System (FMS) differs from a FMC. Cite examples, where a FMS is preferred over a FMC.

(c) Optimizing the overall efficiency and effectiveness of a FMS should be the target of implementing it in a particular manufacturing system. Explain the various types of approaches by which the above target could be achieved.

Q3. (a) Discuss briefly the potential benefits to be expected when Computer Aided Design (CAD) is integrated into the product development procedure.

(b) Explain the terms 'CAD', 'CAM' and 'CAD/CAM' in the context of Advanced Manufacturing Technology.

(c) Discuss the advantages of having "intelligent workstations" with their own local processors and other peripherals in a CAD system.

Q4. (a) Explain the importance of employing automation technologies and computer integration of production support machines and systems, as means of achieving world-class manufacturing in an enterprise.

(b) What makes an industrial robot different from other forms of automated equipment used in manufacturing industries? Elaborate by taking a suitable example.

(c) Discuss the factors that have to be taken into consideration when selecting a robot for a particular application. You may select a suitable example to elaborate on your answer.

Q5. (a) Define "Repeatability" as applied to Computer Numerical Control (CNC) machine tools. What are the design considerations which need to be incorporated at the design stage of a CNC machine tool in order to achieve good repeatability?

(b) Briefly explain 'point-to-point', 'straight line' and 'contouring' control in the context of CNC machine tools. Support your answer by giving examples for each type.

(c) Explain the concept of adoptive control as applied to CNC machines.

Q6. (a) Explain the objectives of material handling systems in a modern factory environment.

(b) What are the specific features of fixed route conveyors? Describe three types of these specified features.

(c) How would you justify the requirement of Automated Guided Vehicle (AGV) system for a factory implementing CIM?

Q7. (a) Explain briefly the method of part programming available in NC systems.

(b) Enumerate the disadvantages of manual part programming over the computer aided part programming.

(c) Discuss the advantages of the 'macro' facility in APT language in relation to CNC part programming.

Q8. (a) "Across the wall" method of engineering product design is very much outdated today". Explain and discuss the new trend in design practice employed in the modern manufacturing industries.

(b) What are the major challenges that need to be addressed before implementing such new design approaches in an enterprise?

(c) One of the goals in introducing new trends in design approaches is to improve work flow. Elaborate on this statement in the context of modern manufacturing environment.

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