The Open University of Sri Lanka
Faculty of Engineering Technology

(045)

Study Programme	:	Bachelor of Technology Honours in Engineering
Name of the Examination	:	Final Examination
Course Code and Title		**DMX5212 – Computer Aided Design and Manufacturing**
Academic Year	:	2021/22
Date	:	February 09, 2023
Time	:	13:30 hrs. – 16:30 hrs.
Duration	:	3 hours

General instructions

1) Read all instructions carefully before answering the questions
2) This question paper consists of 08 questions. All questions carry equal marks.
3) Answers any 05 questions only.

Question 01.

a) Define the term "Computer Integrated Manufacturing (CIM)" and discuss its major elements.
b) Explain the reasons for adopting computer aided design and manufacturing (CAD/CAM) systems in modern manufacturing facilities.
a) Briefly explain three (03) functions included within the scope of manufacturing support systems.

Question 02.

a) Discuss the steps involved in Computer Aided Design (CAD) process.
b) Enumerate various solid-modelling techniques and compare them.
c) Differentiate between Sequential Engineering (SE) and Concurrent Engineering (CE). State why CE is more successful in new manufacturing environment.

Question 03.

a) Explain why Finite Element Analysis (FEA) has become a vital component in CAD environment.
b) What are the design optimization methods available in modern CAD packages for structural components?
c) Explain the necessity of Computer Aided Process Planning (CAPP) in manufacturing industry.

Question 04.

a) Discuss important benefits derived from Group Technology (GT) concept in present-day manufacturing.
b) Briefly discuss the difference between Design for Manufacturing (DFM) and design for assembly (DFA)
c) Discuss the advantages can be achieved by integration of Computer Aided Quality Control (CAQC) with CAD/CAM systems.

Question 05.

a) Briefly explain the term "Rapid Prototyping". State advantages and limitations of Rapid prototyping.
b) Explain the significance of Reverse Engineering in modern manufacturing environment.
c) Briefly explain the factors that you should consider in order to reduce manufacturing cost.

Question 06.

a) Enumerate the disadvantages of manual part programming over the computer assisted part programming.
b) Discuss the various interpolation methods used in NC machines.
c) Discuss how to minimize and eliminate the adverse effects by employing Adaptive Control (AC) in the manufacturing process.

Question 07.

a) State the general characteristics of products to be manufactured using NC machines.
b) What are the important characteristics of computer numerical control (CNC) milling machines?
c) Differentiate Computer Numerical Control (CNC) and Direct Numerical Control (DNC) systems.

Question 08.

a) Write a manual part program to mill the slot of the component shown in *Figure 01.*

Work material : mild steel
Speed : 800 r.p.m.
Feed : 200 mm/min
Depth of cut : 1.5 mm
Sensibly assume any other data.

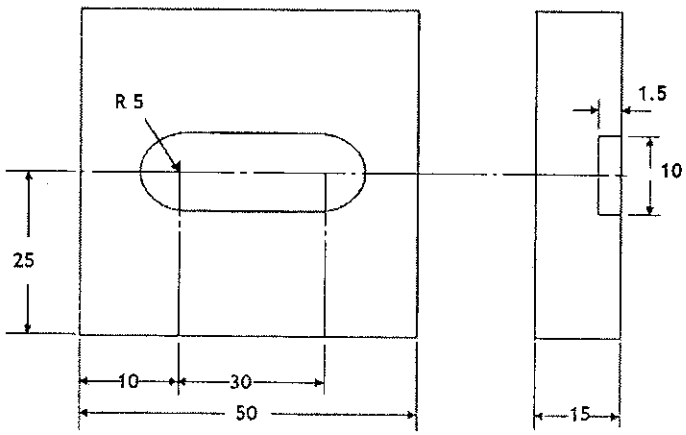

Figure 01