

PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Mid-term Examination: Semester 1

Academic Year: 2004

Date: August 3, 2004

Time: 9:00-12:00

Subject: 226-495 Sp. Tops. in MfE.V(CAD/CAM) Room: R300

Instructions

- Answer all 7 questions in the **answer** book.
- Open-book exam., Any materials, books, papers, calculators and dictionaries are allowed.
- Total score is 100

Questions	Full Score	Assigned Score
Q1	30	
Q2	15	
Q3	10	
Q4	10	
Q5	15	
Q6	10	
Q7	10	
Total	100	

Asst. Prof. Somchai Chuchom

ทุจริตในการสอบ โทษขั้นต่ำคือ ปรับตกในรายวิชาที่ทุจริต และพักการเรียน 1 ภาคการศึกษา

Sopafon

Question 1. (30 marks) Briefly answer the following questions:

- 1.1 What is CAD/CAM Technology?
- 1.2 Sketch a picture to show the CAD tool components and their relationships.
- 1.3 Draw the diagram to show the typical product cycle, also highlight the CAD process and CAM process.
- 1.4 Explain the concept of ‘concurrent engineering’ and how to apply in CAD/CAM process.
- 1.5 What is CAE? Give some examples of technologies involved.
- 1.6 Which type of graphics display to be applied if high resolution of color pictures with vast amount of data are required.
- 1.7 What is ‘the local control’ of the curve? Which kinds of curves possess this property?
- 1.8 Give the main reasons that make Solid Models be accepted and widely apply today.
- 1.9 Why there are many coordinate systems available in the CAD/CAM Software? Identify each of them and specify when to be applied.
- 1.10 Sketch at least 4 different types of surface models.

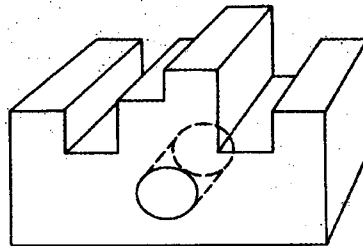
Question 2 (15 marks)

Related to the Data Exchange Standards, answer the following questions.

- 2.1 Why the Data Exchange Standards are important in CAD/CAM technology?
- 2.2 What are the four types of modeling data to make the complete product description?
- 2.3 Briefly explain what you know on these 3 Data Exchange Standards; a) IGES b) PDES and c) STEP.

Question 3 (10 marks)

Draw two possible CSG tree structures for the object shown below.



[Handwritten signature]

Question 4 (10 marks)

For the polygonal data structure given in Figure 4, draw the two-dimensional polygons.

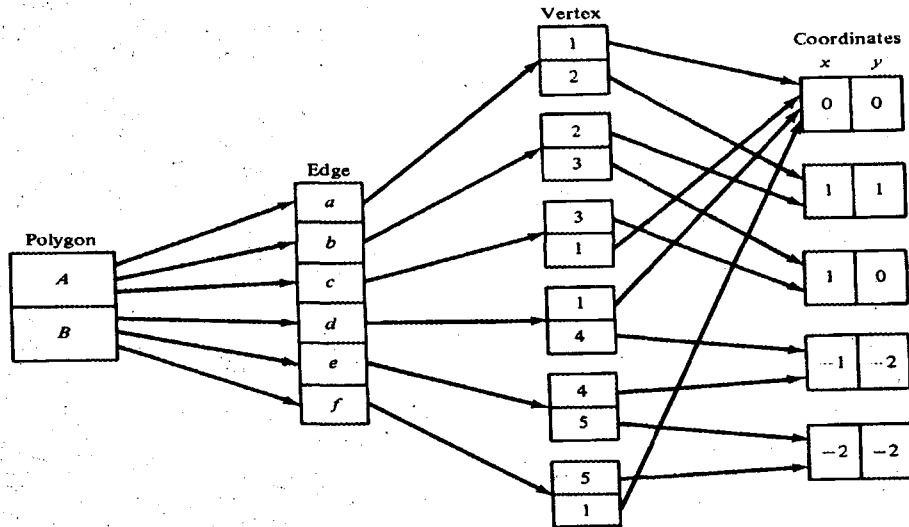


Figure 4

Question 5 (15 marks)

Show what you know on each following topic. Focus mainly on its effects to the CAD/CAM applications.

- Curves or Models manipulation techniques (eg. Displaying, Blending, Trimming, Transformation, etc.)
- CAD/CAM Software package (eg. UG, Pro-Engineer, AutoCAD, Solid Works, etc.)
- List designs that may have required a finite-element stress analysis. Sketch a cross section of a part.

Question 6 (10 marks)

- How the term 'Geometry' and 'Topology' are related?
- Sketch the basic element called 'wedge', and list all topologies of the wedge.

Question 7 (10 marks)

Plot four control points for a Bezier curve in a plane at (0,0), (1,2), (2,-3), and (5,0). Draw the Bezier approximation for these points.