Set No. 1

IV B.Tech I Semester Supplimentary Examinations, February 2008
CAD-CAM
(Common to Mechanical Engineering, Mechatronics and Production Engineering)

Time: 3 hours   **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) In design, what do you understand by synthesis and engineering analysis?

   (b) Explain how CAD helps to synthesize a product design and do engineering analysis for getting optimal design.   [8+8]

2. (a) Write on the importance of studying geometric modeling in CAD.

   (b) What are entities? Explain the methods of defining lines, arcs and Circles in wire frame modeling?   [8+8]

3. Describe with the help of neat sketches the major surface entities provided by CAD/CAM systems.   [16]

4. It is desired to develop bounded primitives for a two- dimensional solid modeler based on the CSG scheme. Plate (rectangular plate and triplate) and disc primitives are to be developed. Find the mathematical definitions of these primitives. [8+8]

5. (a) Briefly discuss about the coordinate systems in NC system.

   (b) Discuss the principal functions of Direct Numerical Control Systems.   [8+8]

6. (a) Discuss the benefits of Group technology.

   (b) What is group technology? Classify a component using any one type of coding system.   [8+8]

7. (a) Discuss various FMS layout configurations.

   (b) What are the functions performed by FMS computer control system.   [8+8]

8. (a) Discuss the principle of variant process planning.

   (b) With the help of a block diagram explain the different sub-modules of a typical Material Requirements Planning system.   [8+8]

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Set No. 2

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Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) Briefly explain the typical hardware components of a stand alone CAD system.
   (b) Describe briefly the two basic techniques used in image generation in computer graphics. [8+8]

2. (a) Define Geometric model. Explain how a 3-D object is represented by a wire frame model.
   (b) Distinguish between 2-D and 3-D wire frame models. [8+8]

3. (a) How do you ensure convex hull property in Bezier surface?
   (b) Describe the effect of characteristic polyhedron over the resulting Bezier surface. [8+8]

4. (a) Describe various commonly used primitives for solid modeling and explain the Boolean operations.
   (b) Describe the properties that a solid model should capture mathematically. [8+8]

5. (a) State the advantages and disadvantages of Numerical Control.
   (b) Draw the block diagram of Adaptive Control with Optimization system for milling machine and explain briefly. [8+8]

6. Explain the following classification and coding systems used in GT.
   (a) The code system
   (b) The MICLASS system. [8+8]

7. (a) What is an FMS?
   (b) Explain in detail the basic components of FMS. [4+12]

8. (a) Explain with a block diagram the Computer-Integrated-Production-Planning-Control-System.
   (b) Distinguish clearly between the Material Requirement Planning (MRP) and Capacity Planning with the aid of block diagrams. [8+8]

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Set No. 3

IV B.Tech I Semester Supplimentary Examinations, February 2008
CAD-CAM
(Common to Mechanical Engineering, Mechatronics and Production
Engineering)
Time: 3 hours   Max Marks: 80
Answer any FIVE Questions
All Questions carry equal marks
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1. (a) What are the functions of an interactive graphic design workstation?
   (b) Explain with the help of a neat sketch, how an image is generated on a computer terminal. [8+8]

2. Explain how 2-D and 3-D transformation are done on a graphics element. [16]

3. Describe with the help of neat sketches the major surface entities provided by CAD/CAM systems. [16]

4. Describe the various methods and operations required in each approach for the Connecting rod. [16]

5. (a) Distinguish between Numerical Control and Computer Numerical Control.
   (b) The figure shown below represents a part outline and is to be milled in two passes using the same milling tool. The tool is a 25mm diameter end mill. Write the part program using APT language. Assume the necessary data. {As shown in the Figure5b} [8+8]
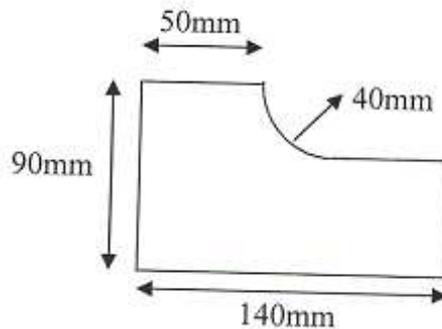

Figure 5b

6. (a) Develop the form code in the opitz system for any simple part of your choice.
   (b) Discuss Product flow analysis. [8+8]

7. Discuss principles of material handling. Name and describe the five types of material handling devices. [16]

8. (a) Explain the miscellaneous functions of a manufacturing cycle that interface with production planning functions.
   (b) Explain general types of non-optical, non-contact inspection methods. [8+8]

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$$\boxed{\text{Set No. } 4}$$

IV B.Tech I Semester Supplimentary Examinations, February 2008
CAD-CAM
(Common to Mechanical Engineering, Mechatronics and Production Engineering)

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) Elaborate on the basic requirements that a CAD software has to satisfy.
   (b) Describe the various database models which are generally used.   [8+8]

2. What is meant by a concatenation matrix? Demonstrate how translation, scaling and rotation operations can be performed simultaneously on a graphic element using concatenation matrix.   [16]

3. What do you mean by blending function? Explain reparametrisation of a surface.
                                                                              [16]

4. Discuss the following for CSG schemes.
   (a) How to represent surface normals and neighbourhoods.
   (b) How to develop a classification algorithm.
   (c) How to combine classifications.   [5+5+6]

5. (a) Differentiate between
        i. Absolute and Incremental positioning system.
        ii. Fixed and Floating zero method.
   (b) Draw the block diagram of Adaptive Control System and explain briefly.
                                                                              [5+5+6]

6. A group technology machine cell contains four machines. Machines 1 and 2 are identical and are used to feed machine 3, which is the key machine in the cell. The output of machine 3 feeds into machine 4. The cell is set up to produce a family of five parts (A,B,C,D and E). The operation times for each part at each machine are given in the following table.

Part	Operation time (min)		
	Machine 1 & 2	Machine 3	Machine 4
A	4.0	15.0	10.0
B	15.0	18.0	7.0
C	26.0	20.0	15.0
D	15.0	20.0	10.0
E	8.0	16.0	10.0

The products are to be produced in the ratio 4:3:2:2:1 .If the hours worked per week are 35, determine how many of each product will be: made by the cell. What is the utilization of the key machine and the utilization of the cell?   [16]

7. (a) What is an FMS?

   (b) Explain in detail the basic components of FMS. [4+12]

8. With the help of a block diagram explain the structure and working of a comput-erized MRP system, explaining the inputs to the system and output reports of the system. [16]

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