

IV B.Tech I Semester Regular Examinations, November 2005

CAD-CAM

(Metallurgy & Material Technology)

Time: 3 hours

Max Marks: 80

**Answer any FIVE Questions
All Questions carry equal marks**

1. With the help of block diagram explain the hardware configuration of a typical stand-alone CAD system. [16]
2. Explain how the curves are represented in [8+8]
 - (a) Generic form
 - (b) Parametric form.
3. Describe with the help of neat sketches the major surface entities provided by CAD/CAM systems. [16]
4. Differentiate between solid modeling and surface modeling methods and representation schemes. [16]
5.
 - (a) Discuss the difficulties encountered in using conventional numerical control.
 - (b) Enumerate the advantages of Computer Assisted Part Programming when compared to Manual Part Programming. [8+8]
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. In each case below, state whether the factor listed is an advantage or a disadvantage of FMS. Discuss the reasons for your choice. [4+4+4+4]
 - (a) Cost
 - (b) Ability to handle different parts requirements
 - (c) Advances in manufacturing technology
 - (d) Reliability
8.
 - (a) State and explain the attributes that influence the Capacity-Planning for Short-Term-Adjustment and that for Long-Term-Adjustment.
 - (b) Define Total Quality Management (TQM) & explain its relevance to CIM. [8+8]

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1. (a) Explain the benefits of CAD over conventional design process.
(b) Explain with the help of a block diagram the hardware structure of a CAD work station. [6+10]
2. (a) Derive the cubic spline equations.
(b) Explain the engineering application of cubic splines. [8+8]
3. Find the tangent and normal vectors to a tabulated cylinder in terms of its directrix. [16]
4. What do you mean by primitive instancing? Explain CSG scheme for complex solid modeling objects representation. [16]
5. (a) Briefly discuss the data required for Computer Assisted Part Programming.
(b) Define Numerical Control. Why computer aided programs are preferred for NC machine tools. [8+8]
6. (a) What is Group Technology? Mention some of the benefits associated with application of GT.
(b) Discuss in brief the different stages of a group technology plan. What types of work are to be conducted at each stage of plan? [8+8]
7. (a) Discuss various FMS layout configurations.
(b) What are the functions performed by FMS computer control system. [10+6]
8. (a) What are the three fundamental concepts in MRP? Explain them.
(b) Outline the objectives of computer-aided quality control. [9+7]

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1. (a) Write a short note on: [10]
 - i. Stroke writing.
 - ii. Raster scan.(b) Explain how a keyboard terminal is used in interactive Computer Graphics. [6]
2. (a) With suitable figures explain the difficulty in displaying holes and curved ends in wireframe modeling?
(b) Briefly explain what a wireframe model is and give its advantages and disadvantages. [8+8]
3. Describe how surface composition is made through [4+4+4+4]
 - (a) Ruled surface
 - (b) Surface of revolution
 - (c) Composite surface
 - (d) Cylindrical surface
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. [10+6]
5. (a) 'Numerical Control increases existing machine tool capacity ' Elucidate.
(b) Prepare an Numerical Control Part Programming manuscript for a simple PTP job shown in figure given below. Assume the necessary machining data. {As shown in the Figure 1} [6+10]
6. (a) Explain the composite part concept in group technology with an example.
(b) Explain the benefits of a well designed classification and coding system for group technology. [8+8]
7. (a) Explain the advantages of FMS.
(b) Discuss the analysis methods for FMS. [8+8]
8. (a) Explain the method of part inspection using co-ordinate measuring machine.

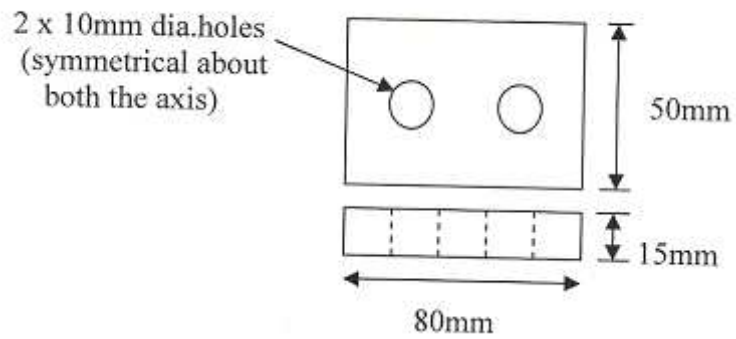


Figure 1:

- (b) What is capacity requirement planning? With the help of a block diagram explain the different modules of a capacity requirement planning software. [6+10]

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1. With a suitable example, explain the various steps involved in design process? [16]
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. Differentiate between
 - (a) Ruled and cylindrical surface
 - (b) Spherical and Cylindrical surface.
 - (c) Composite and surface of revolution. [5+5+6]
4. Discuss the following for half space, representation.
 - (a) How to represent surface normals and neighbourhoods.
 - (b) How to develop a classification algorithm.
 - (c) How to combine classifications. [6+5+5]
5.
 - (a) Discuss the basic feed back control system used in CNC machine tools.
 - (b) Explain the basic components of Direct Numerical Control System. [8+8]
6.
 - (a) Explain machine cell design in group technology.
 - (b) Compare a process-type layout and group technology layout for batch production of a simple component. [8+8]
7.
 - (a) What is an FMS?
 - (b) Explain in detail the basic components of FMS. [2+14]
8.
 - (a) Explain the following with reference to computerized MRP system.
 - i. Independent and dependent demand
 - ii. Bill of Materials.
 - (b) Explain advantages and limitations of CAPP systems. [8+8]
