

Code.No: 07A6EC04

R07

SET-1

III B.TECH – II SEM EXAMINATIONS, DECEMBER - 2010
CAD/CAM
(COMMON TO ME, MECT, MEP, AME)

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

Answer any FIVE questions
All questions carry equal marks

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1. What is meant by product life cycle? Explain the product life cycle in conventional and computer-aided manufacturing environments. [16]
2. a) What is concatenation? Explain its importance in the transformation of graphics.
 b) A triangle is defined in a two dimensional coordinate system by its vertices (0,2), (0,3) and (1,2). Perform the following transformations on this triangle:
 i) Rotate the triangle by 45° about the origin.
 ii) Rotate the triangle by 45° about (-1,-1). [6+10]
3. a) What are the various requirements of geometric modeling ?
 b) A cubic Bezier curve is described by the four control points: (0,0), (2,1), (5,2), (6,1). Find the tangent to the curve at $t = 0.25$. [6+10]
4. What are the various display control commands? Explain them with an example. [16]
5. a) Discuss the influence of friction in CNC machine slides?
 b) The part drawing of a component is shown in Fig.1. Five holes of 12.5 mm diameter are to be drilled at five places. The speed and feed rate are 592 RPM and 100 mm/min respectively. The machine has a floating zero feature and absolute positioning. The thickness of plate is 10 mm. Write the manual part program. [6+10]

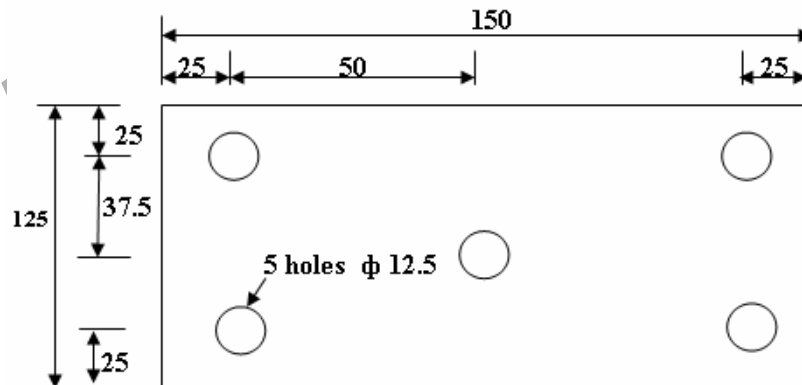


Figure 1 All dimensions are in mm

6. a) What is group technology? Explain the concept of part families.
 b) Discuss Optiz coding system with an example. [8+8]
7. a) Define quality. What are the techniques employed to achieve quality control?
 b) What are the various methods of automated inspection? Explain. [8+8]
8. a) Discuss various types of manufacturing systems with an example.
 b) What is computer integrated manufacturing? Explain the various components of it. [8+8]

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SET-2

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Time: 3hours

Max.Marks:80

Answer any FIVE questions
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- 1.a) Discuss about various types of automation with examples.
- b) Explain the working principle of direct view storage tube display with a neat sketch. [8+8]
- 2.a) Explain Raster Scan Graphics with a neat diagram.
- b) Reflect the polygon whose vertices are A(-1,0), B(0, -2), C(1,0) and D(0,2) about the lines (a) horizontal line $y = 2$ and (b) vertical line $x = 3$. [6+10]
- 3.a) What is meant by sweep ? Discuss in detail the various types of sweep techniques.
- b) A cubic Bezier curve is described by the four control points: (1,1), (3,2), (6,3), (7,2). Find the tangent to the curve at $t = 0.35$. [6+10]
4. What are the basic commands in drafting? Explain the use of any five commands with examples. [16]
- 5.a) Write the block format of G02, G41 and G 81 preparatory functions used in NC programming
- b) It is required to mill the cavity of the component shown in Figure 1. The cutter radius diameter is 20 mm. Write a manual program considering the cutter size into account. The spindle speed is 600 RPM. The feed rate is 100 mm/min. [6+10]

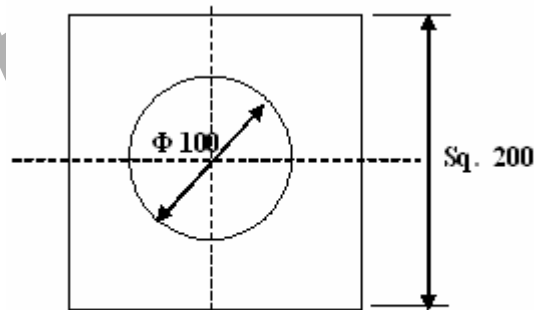


Figure 1

All Dimensions are in mm

- 6.a) Define Part Families, Parts classification and coding.
- b) What is Production Flow Analysis? Discuss the various steps involved in PFA. [6+10]
- 7.a) Distinguish between Inspection and Testing.
- b) What is CMM? Explain various types of CMM with neat sketches. [6+10]
- 8.a) Discuss various types of material handling systems with a neat sketch.
- b) Explain about various types of computerized components in a CIM environment. [8+8]

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SET-3

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Time: 3hours

Max.Marks:80

Answer any FIVE questions
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- 1.a) Discuss the role of computers in industrial manufacturing.
- b) Explain the working principle of raster refresh display with a neat sketch. [8+8]
- 2.a) Explain two dimensional transformations with an example.
- b) A triangle ABC having vertices A (1,1), B (1,7) and C (5,4) is scaled by 3 units in x-direction and then rotated by 30° in anticlockwise direction keeping point (1,1) fixed. Find the transformation matrix. [8+8]
- 3.a) What is lofting ? Explain with an example.
- b) Draw the Bezier curve with the following control points (1,2), (3,4), (6, -6) and (10,8). [6+10]
4. What are the various types of editing commands used in drafting? Explain them with an example. [16]
- 5.a) Define different methods of expressing a circle in APT language.
- b) It is required to make a stepped shaft as shown in Fig.1 on a NC machine. Write the manual part program. Take speed = 3000 rpm and feed = 30 mm/minute. [6+10]

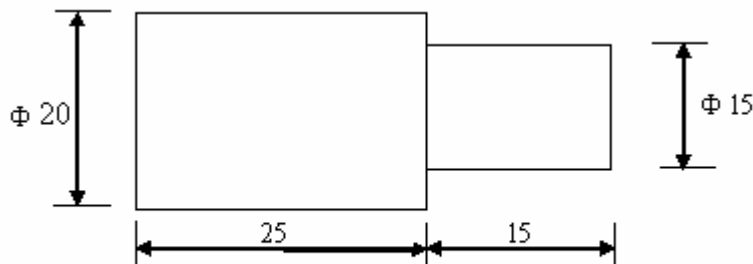


Figure 1

All Dimensions are in mm

- 6.a) Discuss about various types of classification and coding systems.
- b) With an example explain Multi Class coding system. [8+8]
- 7.a) What is SQC? Explain role of various control charts in SQC.
- b) Explain various types of non-contact inspection methods. [8+8]
- 8.a) Describe the role of human workers in the future automated factory.
- b) What is CIM? Discuss the scope of CIM in a manufacturing industry. [8+8]

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SET-4

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Time: 3hours

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Answer any FIVE questions
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- 1.a) Classify manufacturing industries on the basis of type of production, plant layout and automation.
- b) Explain the working principle of inkjet printer with a neat sketch. [8+8]
- 2.a) What is a database ? Explain various types of database models.
- b) A line having end points (3,3) and (5,5) is reflected about a line with equation $y = 2x + 3$. Find the final position of the line. [10+6]
- 3.a) Distinguish between wire frame and solid modelling.
- b) Generate a Bezier curve using the following control points: (2, 0), (4,3), (5,2), (4,-2), (5,-3) and (6, -2). [6+10]
4. What are the various types of basic geometric commands used in drafting? Explain at least five types of commands with an example. [16]
- 5.a) Explain the salient features of a CNC machining centre.
- b) Write a NC part program to drill four holes in a work piece using a drilling machine as shown in Figure 1. The work piece is a rectangular plate of 200 mm x 100 mm x 15 mm. The diameter of holes is 10 mm. Take feed rate of 0.10 mm/rev and spindle speed of 800 rpm. Assume the target point is located at $x = -10$ mm, $y = -10$ mm and $z = 10$ mm. The work piece surface is fixtured such that its bottom surface is 30 mm above the machine tool table surface so as to provide sufficient clearance beneath the part for drilling through holes. [6+10]

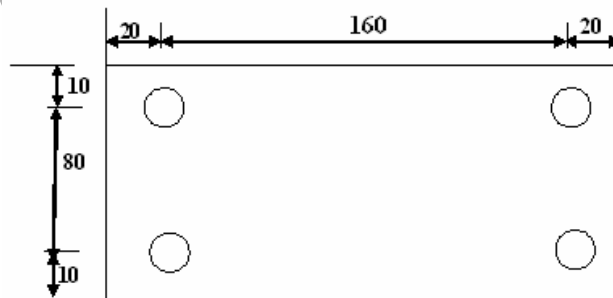


Figure 1

All dimensions are in mm

- 6.a) What is Group Technology? Explain the various methods of grouping parts into part families.
- b) Describe retrieval-type of CAPP system with an information flow chart. [8+8]
- 7.a) What is Quality Control? Discuss the role of computers in Quality Control.
- b) What are various types of non-contact inspection methods? Explain about machine vision inspection system. [8+8]
8. (a) Discuss about various types of computer control systems
- (b) What is CIM? Discuss the benefits of CIM in modern manufacturing systems. [8+8]

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