Code No: 127BD

R15

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, May/June - 2019
CAD/CAM
(Common to ME, AE, AME, MSNT)

Time: 3 Hours   **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

1.a) List the objectives of a CAD data base.   [2]
  b) Differentiate between interpolation and approximation.   [3]
  c) List the various the Boolean operations used in solid modeling.   [2]
  d) Suggest the procedure that is required to create the surfaces of the vanes and inner projections of the shroud of a mixed flow impeller.   [3]
  e) Enumerate any four motion statements used in APT part programming.   [2]
  f) What are the memory devices used in NC, CNC and DNC machines?   [3]
  g) What are the two types of parts similarities?   [2]
  h) What is the importance of Retrieval CAPP system?   [3]
  i) What are the major elements of flexible manufacturing system (FMS)?   [2]
  j) What are the important machine tools in a CIM system?   [3]

PART-B

(50 Marks)

2.a) What are the basic reasons for implementing CAD/CAM applications in design and manufacturing process?
  b) List the major specifications of a design workstation.
 c) Describe the sources of ambiguities in the wire frame modeling of an object.   [4+3+3]

OR

3.a) Enumerate the properties of the Bezier basis functions.
  b) Find the equation of a Bezier curve which is defined by four control points as (80,30,0), (100,100,0),(200,100,0) and (250,30,0).   [3+7]

4.   A cylindrical surface is generated by sweeping a quarter circle in the xy plane along the z-axis by 4 units. The quarter circle has a unit radius and is centered at (0, 0, 0). Derive the parametric equation of the surface. If the surface is to be represented by the B-Spline surface, determine the knot values and the coordinates of the control points.   [10]

OR

5.a) Distinguish between solid modeling using CSG technique and B-rep technique.
  b) Describe the Euler – Poincare formula with suitable examples.
 c) Construct the CSG tree and CSG expressions for a solid model as shown in Figure 1.
  [3+3+4]

Blind Hole
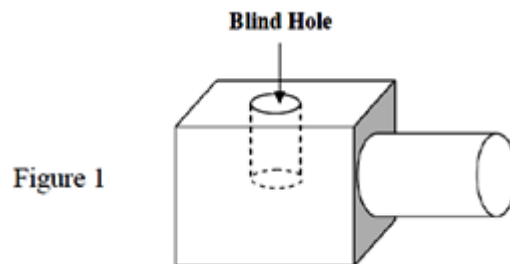
Figure 1

6.a) Compare the Open-Loop NC control system with closed-Loop NC control system.
  b) Write a part program manually to mill the edge of the plate as shown in figure 2. All the dimensions are in mm only. Assume thickness as 15 mm. [3+7]

Figure 2

(35, 40)   (55, 40)
(55, 30)   (80, 30)   ∅25
y
(35, 5)   (80, 5)
x
Start point
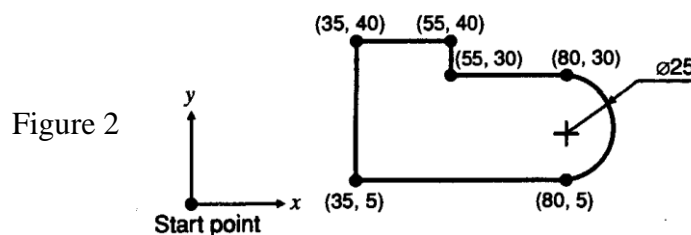
OR

7.a) Explain the usage of IJK part programming method for arc generation.
  b) Write a manual part program to finish turn a hemispherical end on a stainless steel shaft of 30 mm diameter as shown in figure 3. Assume spindle speed as 650 rpm and feed rate as 0.5 mm/rev. [3+7]

Figure 3

R15
∅30
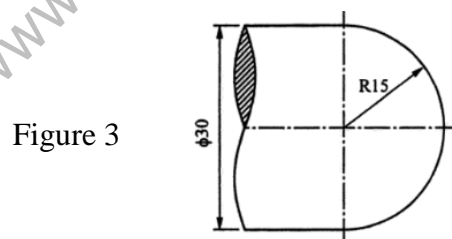
8.a) Discuss the different stages of a group technology plan. Discuss the types of work that are to be conducted at each stage of the plan.
  b) Explain in detail about the production flow analysis. [6+4]

OR

9.a) Describe in detail about the methods used in Computer-Aided Process Planning.
  b) Differentiate between the Enterprise resource planning and Capacity requirements planning.
  [6+4]

10.a) Sketch the layout of a typical FMS and explain the important subsystems.
   b) Compare FMS with transfer lines and CNC on the basis of volume and variety of parts produced.   [6+4]

OR

11.a) Compare different CIM Models with particular reference to the flow of information.
   b) Differentiate between on-line/in-process and on-line/post-process inspection methods. [5+5]

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