Total No. of Questions : 10]

SEAT No. :

P2225

[Total No. of Pages : 3

[5254]-558

B.E. (Mechanical Sandwich Engineering)

CAD/CAM AND AUTOMATION (Elective -I)

(2012 Pattern)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) *Answer five questions.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Figures to the right indicate full marks.*
4) *Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
5) *Assume suitable data, if necessary.*

Q1) a) Explain reflection of geometrical entity about line y = mx + c, with schematic representation and write concatenated transformation matrix. **[6]**

b) Compare analytical and parametric curve with example of circle. **[4]**

OR

Q2) a) Compare geometrical Transformation and mapping. **[4]**

b) Circle is drawn with centre at(5,5) and radius 4 units write parametric equation of circle in recursive form and find number of points on cirlce if increment in angle $\Delta\mu = 30^{o}$. **[6]**

Q3) a) Compare Brep and CSG Technique of solid modeling with neat sketch. **[6]**

b) Derive expression of stiffness matrix for truss elements. **[4]**

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OR

Q4) An axial step bar is shown in figure 1. Determine deflection,stresses and reaction force. **[10]**

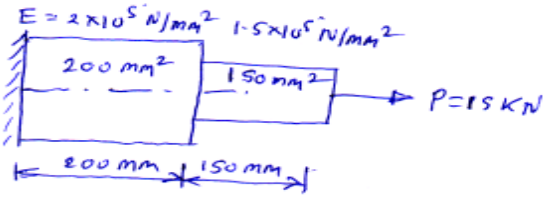

Figure 1

Q5) a) Explain linear, circular CW and circular CCW interpolation with G word format. **[6]**

b) Write CNC part program for roughing and finishing cycle using canned cycle for turned components as shown in figure 2. Assume suitable cutting data: **[12]**

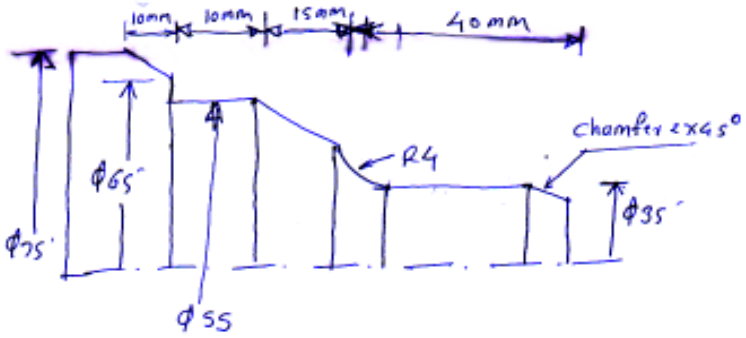

Figure 2

OR

Q6) a) Explain G28 G04 M03 G41 code in part programming. **[6]**

b) Explain canned cycle for drilling and boring for milling components. **[6]**

c) Compare the incremental and absolute method of programming with G code. **[6]**

Q7) a) Classify various R.P. process. **[6]**

b) Explain 3-D printing process. **[10]**

OR

Q8) a) Explain Laminated object manufacturing (LOM) modeling method of rapid prototyping with advantages and limitation. **[12]**

b) List R.P. applications. **[4]**

Q9) a) Draw work envelopes for various robot configurations. Explain the articulated configuration Robot with neat sketch. **[10]**

b) Explain mechanical gripper with figure. **[6]**

OR

Q10) a) Compare various Automations. **[8]**

b) Explain various elements of FEM. **[8]**