Total No. of Questions : 10]

SEAT No. :

P5545

[Total No. of Pages : 3

[5561]-533
B.E. (Mechanical)
CAD CAM AND AUTOMATION
(2015 Pattern)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Assume suitable data, if necessary.***
4) ***Use of calculators is allowed.***

Q1) a) Discuss the necessity of mapping geometric models. **[5]**

b) Discuss Perspective projection of 3D model on 2D plane. **[5]**

OR

Q2) a) A line PQ with vertices P (2,5), Q (6, 7) is rotated by 40° in counter clockwise direction about a point P (2, 2) determine the new coordinates. **[5]**

b) Discuss Boundary Representation for solid modeling. **[5]**

Q3) a) Discuss types of synthetic surface modeling techniques. **[5]**

b) A line is represented by the endpoints P (4, 6) and Q (-3, 12). If the value of Parameter u at P and Q is 0 and 1 respectively, determine the equation of the line. Also determine the coordinate of point on the line at u = 0.2, 0.4 and 0.6. **[5]**

OR

Q4) A step bar as shown in fig. 1, The loading is initially done at 20°C. The temperature then rises to 60°C. Determine the nodal displacements and the elemental stresses developed using 1D elements. **[10]**

E_1 = 72 GPa, E_2 = 210 GPa. $\alpha_1 = 23 \times 10^{-6}$ per °C, $\alpha_2 = 12 \times 10^{-6}$ per °C.
A_1 = 300 mm^2, A_2 = 200 mm^2, $L_1 = L_2$ = 150 mm, P = 10 kN.

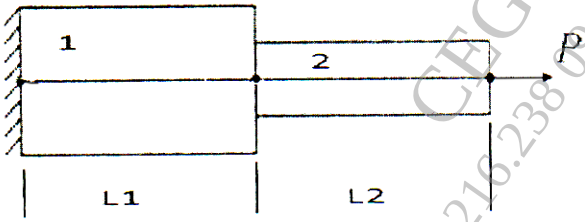

Fig. 1

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Q5) a) Discuss use of subroutine and looping in CNC programing. **[8]**

b) Write CNC program using G and M codes to turn the component shown in fig. 2 having Stock size is ∅ 40mm. Use canned cycles wherever applicable. Assume suitable data for speed and feed. **[10]**

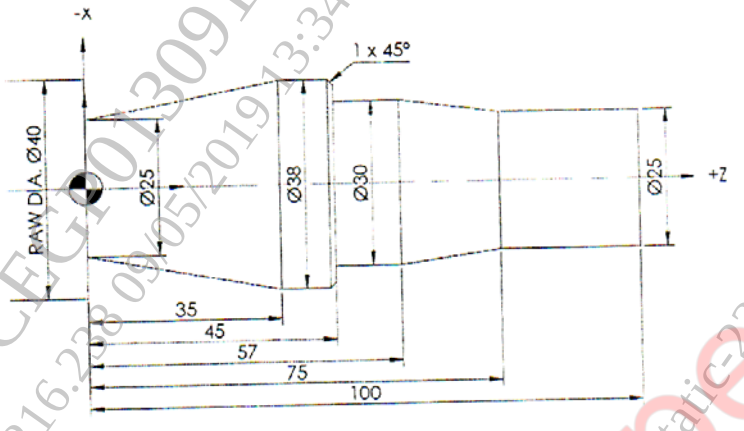

Fig. 2

OR

Q6) a) Write CNC program using G and M codes to contour, face and drill the component shown in fig. 3. Use canned cycles wherever applicable. Thickness of blank is 7mm. Assume suitable data for speed and feed.**[10]**

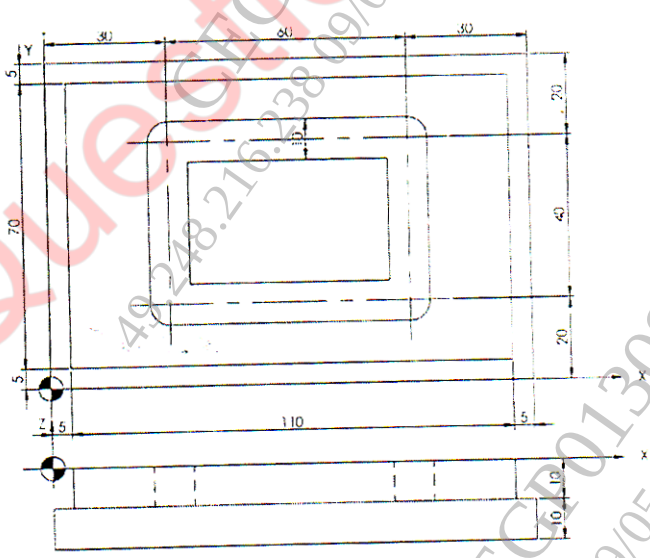

Fig. 3

b) Discuss coordinate system of Vertical Mechining Center and Horizontal Machining Center. **[8]**

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Q7) a) Disccuss the elements of Product Life Cycle. **[8]**

b) Discuss the application, advantages and disadvantages of Stereo Lithography. **[8]**

OR

Q8) a) Explain working principle of Fused Deposition method for rapid prototyping. **[8]**

b) Discuss Collaborative Engineering with suitable example. **[8]**

Q9) a) Discuss hard and soft automation. **[8]**

b) Discuss robot anatomy with neat sketch. **[8]**

OR

Q10)a) Discuss Concepts of Computer Integrated Manufacturing in brief. **[8]**

b) Discuss need and application of Automated guided vehicle. **[8]**

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