Total No. of Questions : 10]

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B.E. (Mechanical Engineering) **CAD/CAM & Automation** (2015 Course) (Semester - I) (402042)

Time : 2¹/₂ Hours]

[Max. Marks : 70

Instructions to the candidates:

- Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8 and Q9 or Q10. 1)
- 2) Neat diagrams must be drawn wherever necessary.
- Figures to the right indicate full marks. 3)
- Use of Electronic pocket Calculator is allowed. 4)

Compare B-Spline and Bezier curves.

- Assume suitable data, if necessary and mention it clearly 5)
- Explain the different types of coordinates systems used in CAD. [4] *Q1*) a)
 - The co-ordinates of the center of circle are C(3, 4, 5) in WCS. Find the b) coordinates of Centre of circle with respect MCS. The orientation of MCS and WCS is shown in Fig.1. [6]



Q2) a)

Write a parametric equation for a circle having end points of diameter as b) $P_1(6, 4)$ and $P_2(10, 10)$. Calculate center point, radius and coordinates of the circle. [5]

P.T.O.

[5]

- Q3) a) Explain the effect of number of elements and nodes on FEA result. [4]
 - b) A stepped bar with circular cross section consist of two segments. Determine nodal displacements and support reactions. [6]



Q4) For the two-bar truss shown in Fig. 2, determine the displacement of nodes and the stress in element 1. [10]



- Q5) a) Explain different types of zero's used in NC programming.
 - b) Write a CNC part program to turn a MS bar of size and shape as shown in following figure. Use canned cycles only for both rough turning and finish cut. Assume feed rate (0.8 mm/rev.) and spindle speed (1000 RPM). All dimensions are in mm. [10]



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- *Q6*) a) Explain in detail motion control modes used in CNC machines. [6]
 - b) Write CNC program for the part as shown in Fig.3. Assume suitable data. [10]



- Q7) a) Explain the Need and components of PLM.
 - b) Explain working principle and features of Fused Deposition Modeling with neat sketch and state any three applications. [10]

[6]

[6]

[6]

b) Explain working principle with neat sketch the selective Laser sintering Process and enlist advantages and disadvantages. [10]

Q9) Write short notes on :

- a) Types of Automation
- b) Advantages and Cimitations of Flexible Manufacturing System.
- c) Computer Integrated Manufacturing.

OR

- **Q10**)a) Explain the criteria for selection of gripper design. [6]
 - b) Explain the term payload, precision and accuracy related to the robotics.
 - c) Compare between hydraulic and pneumatic drives used in robots. [6]

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