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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

February / March 2023 Semester End Main Examinations

Programme: B.E. **Semester: V**
Branch: Mechanical Engineering **Duration: 3 hrs.**
Course Code: 20ME5DCCCR **Max Marks: 100**
Course: CAD/CAM and Robotics **Date: 13.03.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may suitably be assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

UNIT - I

1 a) A triangle with coordinates (15, 30), (25, 35) and (5, 45) is to be rotated by 10° counter clockwise about the origin and then scaled to twice its size. Obtain the necessary transformation matrix and Compute its new coordinates. **10**

b) Explain the organization of a typical CAD/CAM software without and with graphic standard. **10**

UNIT - II

2 a) A cubic Beizer curve is defined by the control points (20,20) (60,80) (120,100) and (150,30). Find the equation of the curve and its midpoint. **10**

b) With neat sketches, illustrate different entities used in surface modelling. **10**

OR

3 a) Compare Constructive solid geometry approach with Boundary – Representation system of solid modelling. **10**

b) Explain IGES data exchange format. **10**

UNIT - III

4 a) With neat sketches illustrate the designation of axes in i)NC milling machine ii) NC lathe machine. **06**

b) Explain any two i) Actuation system and ii) Feedback devices used in CNC machines **14**

UNIT - IV

5 a) Write a manual part program for the following turning component shown in Fig 1. Use one finish cut and remaining rough-cut to remove the material (Select suitable raw material dimension and any other data can be suitably assumed). Use the following information: **10**

Operation	Tool no.	Cutting Speed (m/min)	Feed (mm/rev)
Rough cut	T01	200	0.4
Finish cut	T02	300	0.2

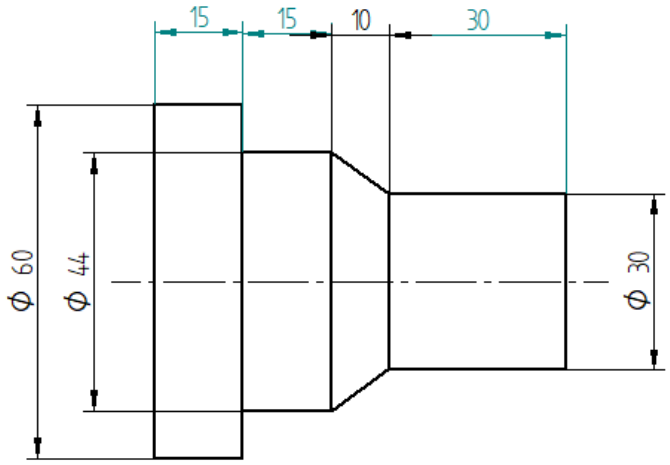

Fig 1

b) List and explain Post processor commands used in APT Programming **10**

UNIT - V

6 a) What are the components of an industrial robot? Explain. **10**

b) Explain the different robot characteristics. **10**

OR

7 a) Sketch and explain the working of i) Potentiometer and ii) LVDT sensor used in Robots. **10**

b) Explain the different types of Robot programming **10**

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