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APR-MAY

B. E. (Seventh Semester) Examination, 2020

(Old Scheme)

(Mech., Mechatronics Engg. Branch)

COMPUTER AIDED DESIGN & MANUFACTURING

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Attempt all questions. Part (a) from each question is compulsory. Attempt any two parts from (b), (c) and (d) of each question.

Unit-I

1. (a) Give the definition of product.

2

[2]

- (b) What is the role of computers in manufacturing environment? 7
- (c) What is the difference between sequential engineering and concurrent engineering? 7
- (d) Explain automation and CAD/CAM. 7

Unit-II

2. (a) Explain the objective of database. 2
- (b) Explain the various types of data structures with diagrams. 7
- (c) Describe parametric and non-parametric forms of equation for curve representation. 7
- (d) The four point with coordinates are given by

$$P_0 = [2 \ 2 \ 0]^T \quad P_2 = [2 \ 3 \ 0]^T$$

$$P_1 = [3 \ 3 \ 0]^T \quad P_3 = [3 \ 2 \ 0]^T$$

Find the equation of Bezier curve. Also find points on the curve for

$$u = 0, 0.25, 0.5, 0.75 \text{ and } 1. \quad 7$$

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[3]

Unit-III

3. (a) Draw the figure showing 'Right-hand Rule'. 2
- (b) Describe the difference between CNC and DNC. 7
- (c) Define the numerical control system with its components. 7
- (d) Write an ISO program for step turing operation of the component shown in fig. 1. using canned cycles. The diameter of the work piece = 30 mm. 7

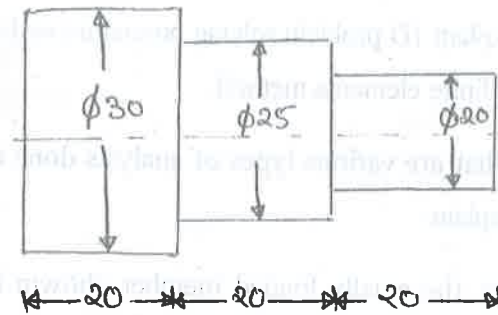


Fig. 1

Take, Feed = 0.5 mm/min

Spindle speed = 1200 rpm

Unit-IV

4. (a) Define Group Technology. 2

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PTO

[4]

- (b) Write the difference between retrieval CAPP and generative CAPP. 7
- (c) Explain OPTIZ class classification system with the help of block diagram. 7
- (d) What are the various types of machine cells? 7

Unit-V

5. (a) Explain types of elements. 2
- (b) Explain 1D problem solving procedure with the help of finite elements method. 7
- (c) What are various types of analysis done in FEA? Explain. 7
- (d) For the axially loaded member shown in fig. 2 determine the nodal displacements. 7

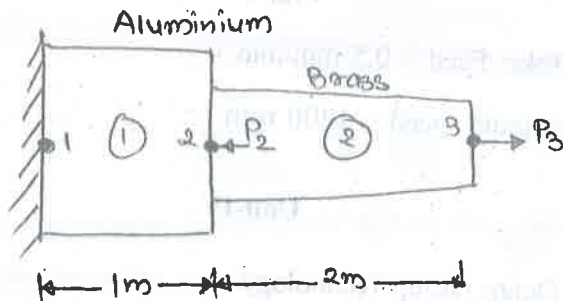


Fig. 2
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[5]

- Area of aluminium rod = $39 \times 10^{-4} \text{ m}^2$
- Area of Brass rod = $13 \times 10^{-4} \text{ m}^2$
- Modulus of Elasticity, $E_{AL} = 70 \text{ Gpa}$
- Modulus of Elasticity, $E_{Brass} = 100 \text{ Gpa}$
- Axial load $P_2 = 280 \text{ kN}$
- Axial load $P_3 = 100 \text{ kN}$