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# P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Fifth Semester, B.E. - Mechanical Engineering

Semester End Examination; Feb. - 2021

**CAD / CAM**

Time: 3 hrs

Max. Marks: 100

*Note: Answer FIVE full questions, selecting ONE full question from each unit.*

## UNIT - I

- 1 a. Define CAD and CAM. Explain their significance in product development cycle. 8
- b. Explain the working principle of laser printer. 4
- c. What are the various image generating techniques employed for graphics display? Explain them with neat sketch. 8
- 2 a. With neat sketch, explain the following display devices: 12
- i) Cathod Ray Tube
- ii) LED Display
- b. Explain the role of computer in Product design process. 8

## UNIT - II

- 3 a. Derive transformation matrix for 2-D rotation transformation from origin. 8
- b. Briefly explain the following geometric modeling: 12
- i) Wire frame modeling
- ii) Surface modeling
- iii) Solid modeling
- 4 a. Derive transformation matrix for reflection of an object over a arbitrary line  $y = mx + c$ . 11
- b. Describe Beizier curve, B splines and NURBS. 9

## UNIT - III

- 5 a. List the advantages and limitations of NC machines. 10
- b. With block diagram, explain the basic components in NC system. 10
- 6 a. With neat sketch, explain the open-loop and closed-loop control systems in NC machine. 10
- b. With neat sketch, explain the vertical machining centre. 7
- c. Explain paper tape port program input format system. 3

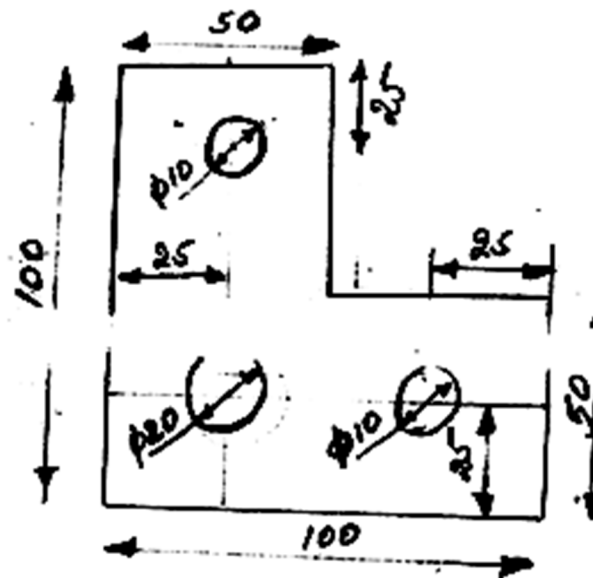
## UNIT - IV

- 7 a. With neat sketch, explain spindle design for CNC turning centre. 8
- b. Write a short note on the following cutting tool materials: 12
- i) High speed steel
- ii) Cemented carbides
- iii) Ceramics

- 8 a. With the help of ISO code, explain the coding system for tungsten carbide inserts. 8
- b. Write a short note on automatic tool changers in CNC centers. 4
- c. List the possible event sequence for tool changing in case of a double gripper. 8

**UNIT - V**

- 9 a. Discuss the following Interpolation functions with examples: 8
  - i) Linear Interpolation
  - ii) Circular Interpolation
- b. The component to be machined is shown in below figure. Write a program using canned cycles to drill all the holes shown in figure. 12



- 10 a. Explain the steps involved in development of a proven part program in NC machine. 11
- b. Explain the following canned cycles used for developing turning programs: 9
  - i) Turning canned cycle
  - ii) Facing canned cycle
  - iii) Thread cutting canned cycle

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