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7E7018

Roll No. _____ [Total No. of Pages : 3

7E7018

B.Tech. VII - Semester (Main&Back) Examination, Nov. - 2019
Mechanical Engineering
7ME6.3A CNC Machines and Programming
(Common for ME,PE)

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 26

Instructions to Candidates:

*Attempt any **five questions**, selecting **one** question from **each unit**. All Questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.*

UNIT - I

1. a) Define numerical control machine. What is NC Part Programming? What are the applications of NC machines? **(8)**

   b) *Describe the historical developments* in Automation. **(8)**

(OR)

1. a) Define CNC Machine Tool with Schematic diagram. **(8)**

   b) What are the advantages and Limitations of NC machines over Conventional Machines? **(8)**

UNIT - II

2. a) What are design consideration in the architecture of NC systems? Explain its Mechanical Elements. **(8)**

   b) Explain Guideways and slides, Guideways elements, Transmission system. **(8)**

(OR)

2. a) Explain Spindle unit, Coolant system and lubrication System in NC Machine. **(8)**

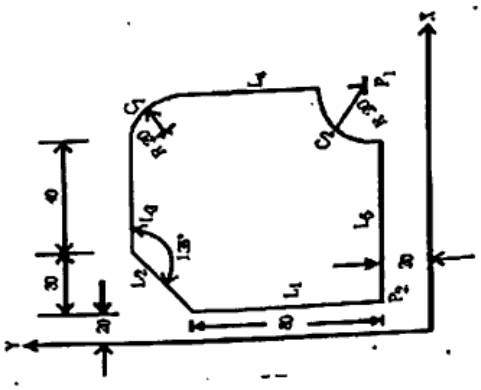
   b) Why is CNC Machining necessary? What are major components related to CNC machine tools? **(8)**

[Contd....

UNIT - III

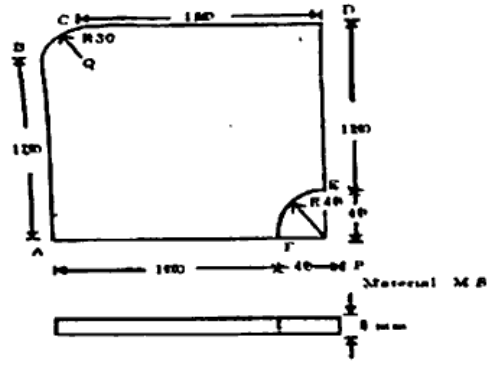
3. a) What do you mean by program? What does it consist of? Write CNC program structure. **(8)**

b) Name the four types of statements in a complete APT part program. Prepare part program for geometry description of the contour shown in the figure below : **(8)**



(OR)

3. a) Prepare part program to machine the contous shown in the figure using APT on CNC milling machine. **(8)**



b) Describe Language based automatic part program generation. **(8)**

UNIT - IV

4. a) What are a manipulator, wrist and end effectors for a robot? Classify robots as per their path control. **(8)**

b) Explain kinematic simulation and volumetric simulation. **(8)**

(OR)

4. a) Define CAPP systems, What is 5 axis programming? **(8)**

b) Explain NC simulation. What are applications of volumetric NC simulation? **(8)**

UNIT - V

5. a) Explain Die sinking and Rapid product development. **(8)**

b) Explain Hardware based AC in detail. **(8)**

(OR)

5. a) Explain CAM, FMS and CIM. **(8)**

b) What are various optimisation criteria in - adaptive control? **(8)**
