7E7018

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)

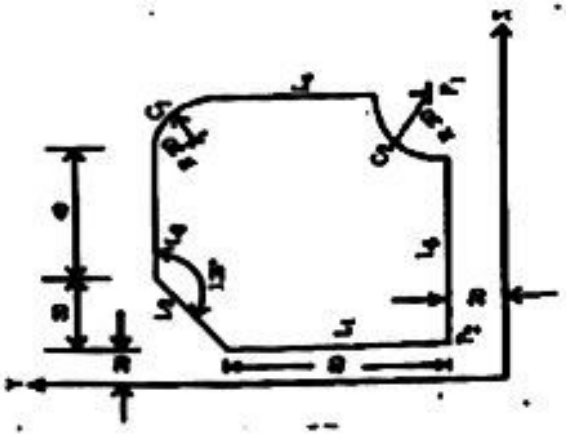
2. a) Explain Spindle unit, Coolant system and lubrication System in NC Machine. (8)

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

UNIT - III

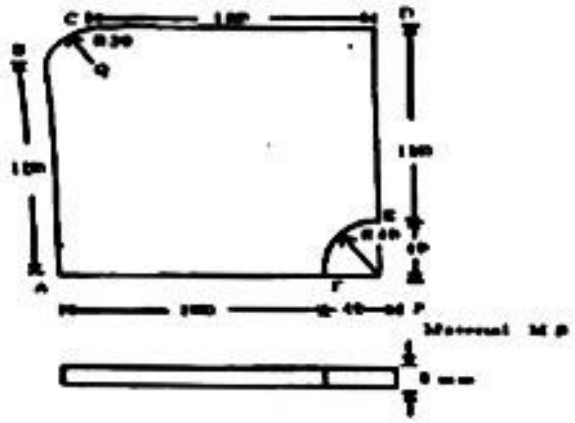
3. a) What do you mean by program? What does it consist of? Write CNC program structure. (8)

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)
