B. TECH
(SEM VII) THEORY EXAMINATION 2019-20
COMPUTER AIDED MANUFACTURING

Time: 3 Hours   *Total Marks: 100*

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1.   **Attempt *all* questions in brief.**   **2 x 10 = 20**

   a.   What are the basic needs of Automation?
   b.   Under what situations where manual labor is usually preferred over automation, in an industry?
   c.   List the different programming formats of NC programming.
   d.   Differentiate between absolute and incremental coordinate system.
   e.   What are preparatory and miscellaneous functions? Also write any two G and M codes used in manual part programming.
   f.   What are the requirements of an interpolator?
   g.   Define fixed and floating zero in CAPP.
   h.   What is meant by canned cycle in CNC?
   i.   What is an Artificial Intelligence for intelligent manufacturing?
   j.   Differentiate between FMC and FMS.

SECTION B

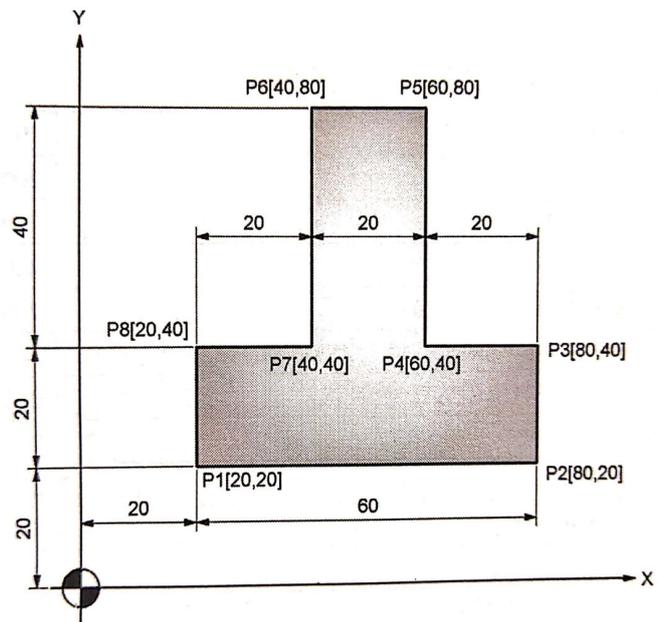2.   **Attempt any *three* of the following:**   **10 x 3 = 30**

   a.   Discuss fixed, flexible and programmable type of automation in industry using suitable examples.
   b.   Discuss the factors by which accuracy and productivity of NC machines can be increased compared to conventional machine.
   c.   Briefly explain and describe with neat sketches, the principle and working of:
      (i) Encoder
      (ii) Stepper motor
   d.   Write NC part program for the machined component of thickness 10 mm to be to drill all the holes as shown in figure. All dimensions are given in mm. Assume speed = 750 RPM and feed = 200 mm/min.
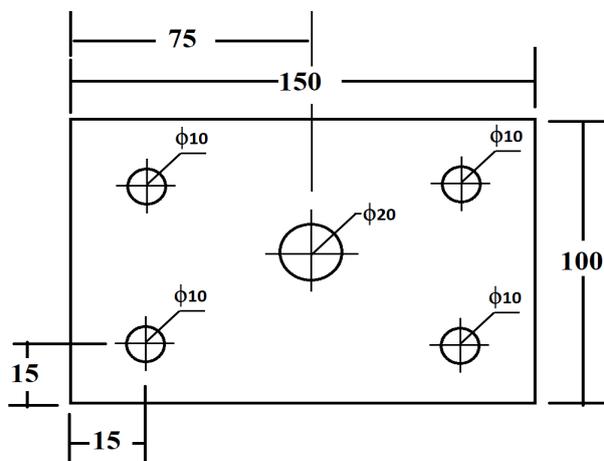
   e.   Write shorts notes on the following?
      (i) Transfer lines
      (ii) Classification of manufacturing systems.

SECTION C

3.   **Attempt any *one* part of the following:**   **10 x 1 = 10**

  (a)   Write down the shorts notes on the following:
        (i)   Migration to automation
        (ii) Automated Guided Vehicles (AGVs)
  (b)   What are strategies of automation? Explain any four strategies with suitable examples.

4.   **Attempt any *one* part of the following:**   **10 x 1 = 10**

  (a)   What are the basic components of NC machine? Explain the functions and types of MCU in NC/CNC system?
  (b)   Write shorts notes on the following type of Automatic Tool Changer (ATC):
        (i)   Magazine type
        (ii) Turret head type

5.   **Attempt any *one* part of the following:**   **10 x 1 = 10**

  (a)   What is adaptive control system? Discuss the ACC and ACO types of adaptive control with the help of suitable examples.
  (b)   Define the followings:
        (i)   DAC vs ADC
        (ii) Linear vs circular interpolation

6.   **Attempt any *one* part of the following:**   **10 x 1 = 10**

  (a)   Under what conditions, Macro is preferred over subroutine in NC part programming? Discuss.
  (b)   Write a complete APT part program to machine the outline of the geometry show in figure.

7.   **Attempt any *one* part of the following:**   **10 x 1 = 10**

  (a)   What is group technology? Why part classification and coding are required in group technology? Explain with suitable examples.
  (b)   What is robot and how they are useful in automated manufacturing industries? Briefly discuss the basic functions of robot elements.