

22563

24225

3 Hours / 70 Marks

Seat No. 

--	--	--	--	--	--	--	--

- 
- Instructions* – (1) All Questions are *Compulsory*.  
(2) Answer each next main Question on a new page.  
(3) Illustrate your answers with neat sketches wherever necessary.  
(4) Figures to the right indicate full marks.  
(5) Assume suitable data, if necessary.  
(6) Use of Non-programmable Electronic Pocket Calculator is permissible.  
(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

1. **Attempt any FIVE of the following :** **10**
- a) State needs of Non-conventional Machining processes.
  - b) Name the various types of cutters used in Milling operations.
  - c) List various gear manufacturing method.
  - d) Name the basic components of an CNC machine.
  - e) Define home position and programme zero in CNC part programming.
  - f) Explain the canned cycle.
  - g) State basic components of Robot.
2. **Attempt any THREE of the following :** **12**
- a) Explain the function of the dielectric fluid used in EDM.
  - b) Compare between Up milling and Down milling process.
  - c) Explain Automatic Tool Changer [ATC] of CNC machine.
  - d) Justify need of tool length compensation of CNC machine.

P.T.O.

**3. Attempt any THREE of the following :****12**

- Differentiate between gear hobbing and gear shaping.
- Explain absolute and incremental co-ordinate system in CNC machine with suitable example.
- Explain subroutine programming format with simple example.
- Describe type of Automation with suitable example.

**4. Attempt any THREE of the following :****12**

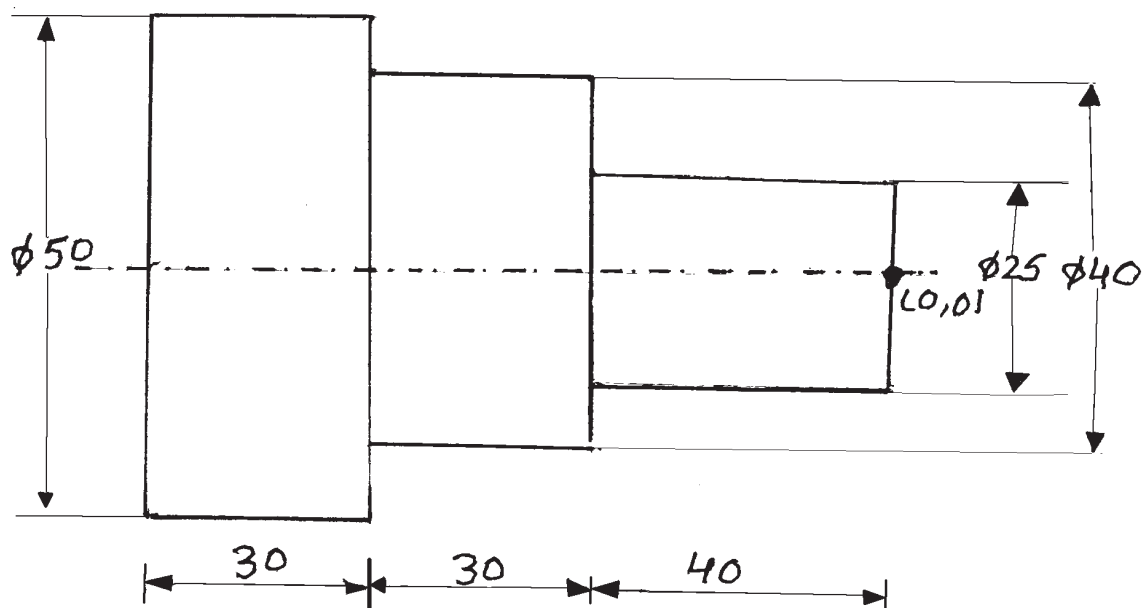
- Describe the principle of operation of gear hobbing process with neat sketch.
- Apply right hand rule of axes identification to CNC vertical milling machine with neat sketch.
- Develop a CNC program using appropriate G and M code to turn component as shown in Fig. No. 1.

Given : Raw Material = MS  $\phi$  52  $\times$  101 mm

Cutting speed (V) = 50 m/min

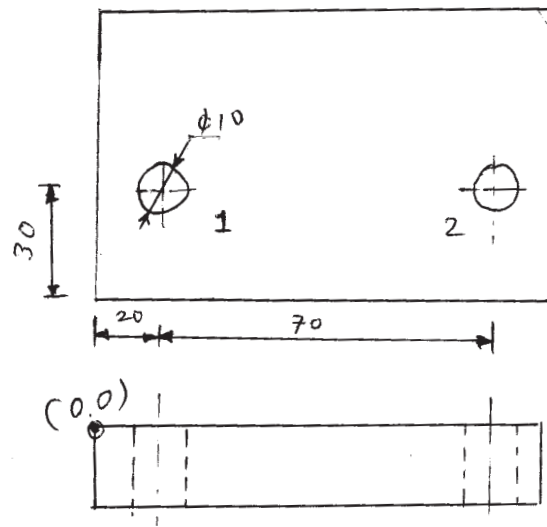
Feed = 0.2 mm/rev

Assume suitable data for depth of cut.



**Fig. No. 1**

- d) Write a programme to drill the two holes as shown in Fig. No. 2 the plate thickness is 10 mm.



**Fig. No. 2**

- e) What is FMS ? Explain basic components of FMS.

**5. Attempt any TWO of the following :**

**12**

- Draw Abrasive Jet Machining (AJM) setup diagram showing all the elements. Also state the function of each elements.
- Explain internal mechanism of universal dividing head with neat sketch.
- Explain open loop control system and closed loop control system in CNC with suitable example.

**6. Attempt any TWO of the following :****12**

- a) Draw setup diagram of wire cut EDM and label the parts, also suggest approximate range of following process parameters with it's measuring unit.
    - i) Discharge current
    - ii) Pulse frequency
    - iii) Wire speed
    - iv) Wire Tension
  - b) Compare simple indexing and compound indexing method with suitable example.
  - c) Justify the need of gear finishing. Demonstrate gear grinding finishing process with important process parameters.
-