

22563

23124

3 Hours / 70 Marks

Seat No.

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- 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 any four needs of non-conventional machining processes.
 - b) Enlist different milling operations (Any four).
 - c) List various gear finishing method (Any four).
 - d) State two advantages of CNC machines over conventional machines.
 - e) Write meaning of following G and M-codes.
 - i) G 03
 - ii) M 08
 - f) State the meaning of subroutine and canned cycle in CNC part programming.
 - g) Define robotics. State two application of robot.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) Explain working principle of Abrasive Jet Machine (AJM) with neat sketch.
 - b) Compare between up milling and down milling process. (four points)
 - c) Describe the concept of cutter radius compensation for CNC machine with suitable example.
 - d) Justify need of tool length compensation of CNC machine.
- 3. Attempt any THREE of the following:** **12**
- a) Classify the different method of gear manufacturing.
 - b) Explain absolute and incremental co-ordinate system in CNC machines with suitable example.
 - c) Explain the term preparatory function and miscellaneous function in the context of CNC Part programming.
 - d) Describe fixed and programmable automation.

4. Attempt any THREE of the following:

12

- Differentiate between gear hobbing process and gear shaping process (four points).
- Explain work holding devices used in CNC lathes.
- Prepare process sheet and calculate cutting parameters for turning on CNC lathe for the component shown in Figure No. 1. Neglect tool compensation. Assume suitable data if necessary.

Given – Raw material stock : $\phi 35 \times 50$ mm

Stock : Aluminium

Feed (f) : 0.2 mm/rev.

Cutting velocity (v) = 90 m/min.

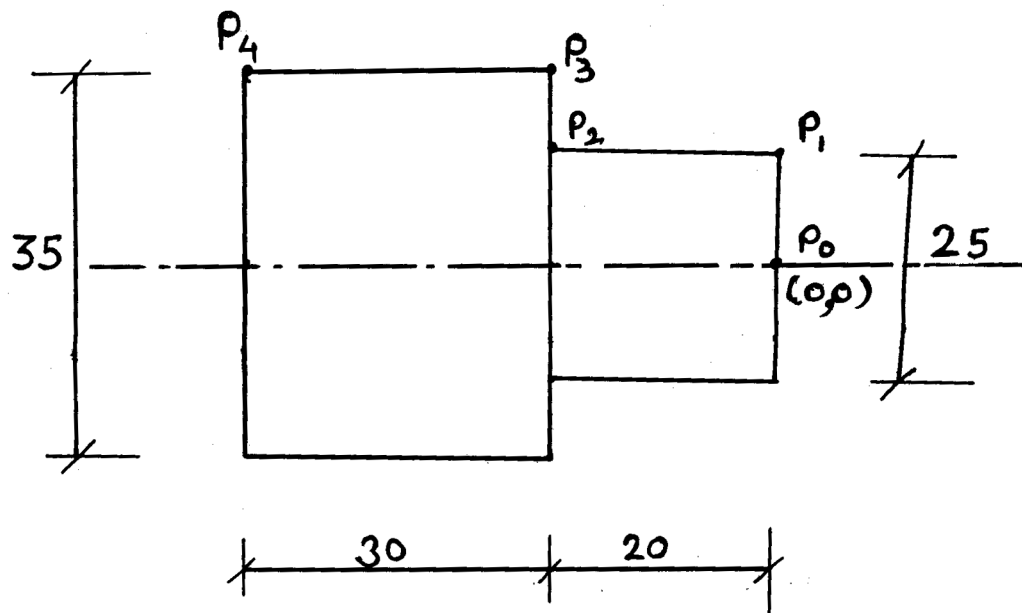


Fig. No. 1

- Develop full G and M - code manual part program of CNC lathe for component given in Figure No. 1 in Word Address Formate (WAF).
- Justify the need of group technology in today's manufacturing system.

- 5. Attempt any TWO of the following:** **12**
- a) Draw set up diagram of EDM process showing all the elements. State function of dielectric fluid with example.
 - b) Draw internal mechanism of universal dividing head and label the parts.
 - c) Illustrate axes nomenclature of CNC lathe and milling with sign conventions.
- 6. Attempt any TWO of the following:** **12**
- a) Draw the setup diagram of Laser Beam Machining (LBM). Explain the function of elements in setup.
 - b) Apply compounding indexing method for indexing 69 divisions.
 - c) Justify the need of gear finishing. Demonstrate any one gear finishing process with important process parameters.
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