

22563

22223

3 Hours / 70 Marks

Seat No.

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- Instructions* –
- (1) All Questions are *Compulsory*.
 - (2) Illustrate your answers with neat sketches wherever necessary.
 - (3) Figures to the right indicate full marks.
 - (4) Assume suitable data, if necessary.
 - (5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.
 - (6) Preferably, write the answers in sequential order.

Marks

- 1. Attempt any FIVE of the following: **10****
- a) List down the various mechanical energy based unconventional machining processes.
 - b) Define angle milling cutter.
 - c) List the gear generating processes.
 - d) Enlist the main functions of CNC.
 - e) State the function of G01 and M12 codes in CNC Programming.
 - f) Explain the term canned cycle.
 - g) Enlist the benefits of automation

P.T.O.

2. Attempt any THREE of the following: 12

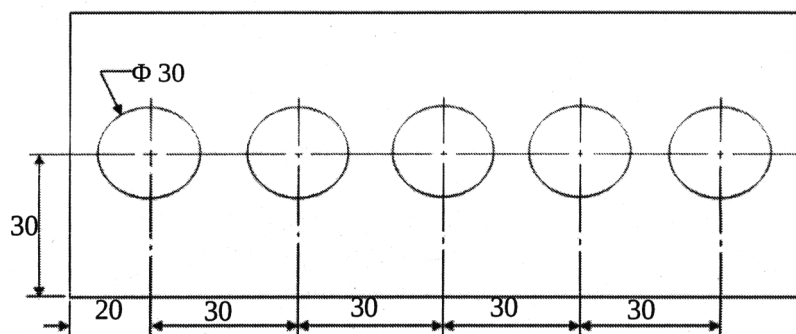
- Describe the basic mechanism of material removal in AJM with neat sketch.
- Explain the construction of planomiller with neat sketch.
- Explain linear and circular interpolations used in turning with suitable examples.
- Explain the term cutter tool compensation and state it's importance in CNC machine part programming.

3. Attempt any THREE of the following: 12

- Explain the principle of operation of gear hobbing process with neat sketch.
- Describe with sketch the working and construction of recirculating ball screw used in CNC machine.
- Describe the various formats used for manual part programming and write word address format.
- State the objectives of cellular manufacturing? List the different types of machine cell design.

4. Attempt any THREE of the following: 12

- Differentiate between gear hobbing process and gear shaping process.
- List the requirements to operate the automatic tool changer (ATC).
- Construct a part programme for the following component using do-loops shown in Fig. No. 1 (All dimensions are in mm)

**Fig. No. 1**

- d) Develop a CNC program using appropriate G and M code to turn component as shown in Fig. No. 2.

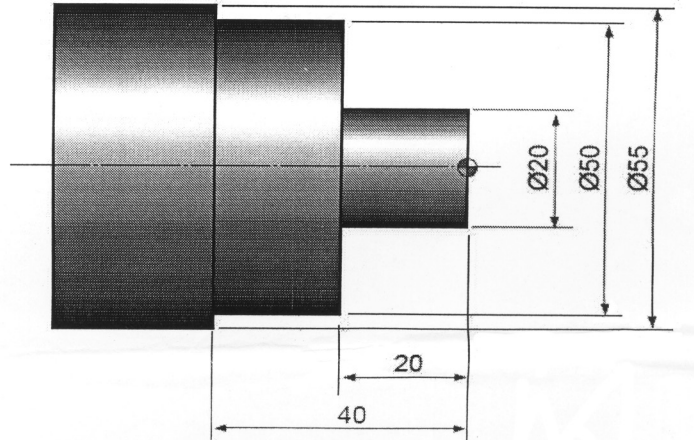


Fig. No. 2

Raw material : MS ϕ 57 \times 70mm, cutting speed $V = 40$ m/min and Feed = 0.1 mm/rev. Assume suitable data for depth of cut.

- e) Define the term FMS? Explain basic components of FMS.

5. Attempt any TWO of the following:

12

- Explain the working principle of PAM with neat sketch and list the applications of PAM.
- Explain the cutting parameters in milling machine. How is the machining time calculated on a milling machines.
- Explain : Open loop control and closed loop control in CNC with suitable example.

6. Attempt any TWO of the following:

12

- Describe the working principle of EDM with neat sketch and list the applications of EDM.
- With suitable example, explain the steps for compound indexing.
- Explain with neat sketch pinion cutter gear shaping process.