

( 3 Hours)

[ Total Marks : 80

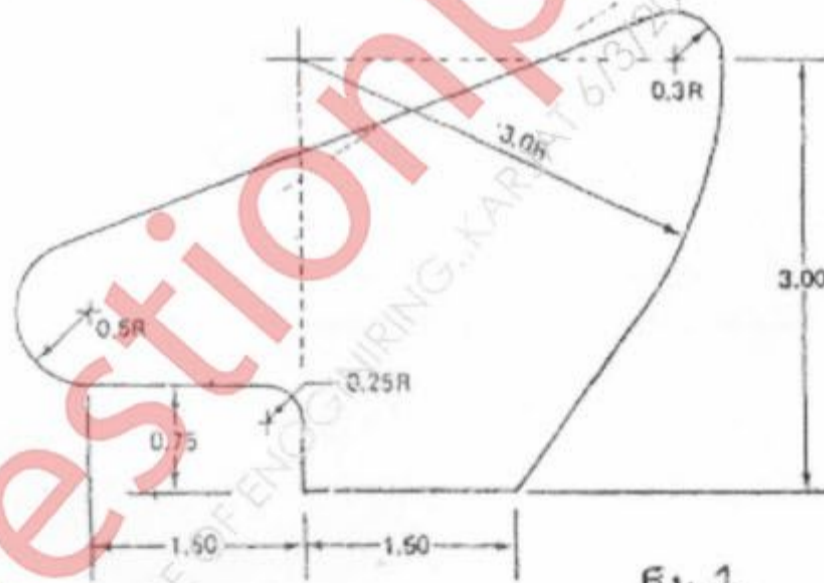
- N.B. :** (1) Q. 1 is compulsory. Attempt any 3 out of remaining six questions.  
(2) Assume suitable data, if required & justify.  
(3) Use the standard process sheet for preparing operation routing.



1. Attempt any four :

- Explain TNRC. Discuss when and how it is used in the part program.
- With an example explain absolute and incremental coordinate system.
- Explain the features of lean manufacturing.
- Describe scanning laser beam.
- What is Ghost factory?

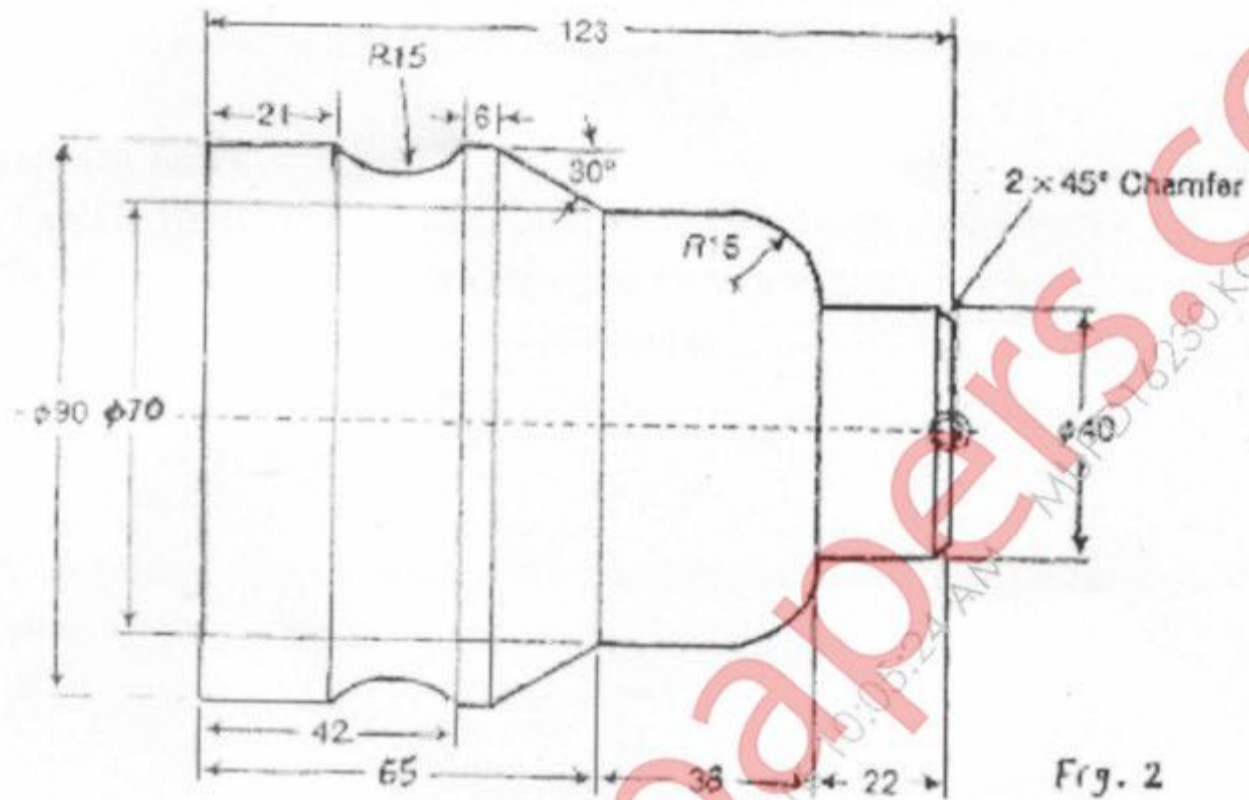
2. (a) Component shown in figure 1 below is to be milled externally. Write an APT program for the same.



m.s. plate  
10 mm thick

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- (b) Write CNC part program using cycles for the component shown in fig.2 below. 10  
 Workpiece material is mild steel.



3. (a) Describe the factors considered while designing the spindle of CNC machine. 6  
 (b) What are the various approaches of CAPP? 6  
 (c) Explain in detail typical ATC used in CNC. 8
4. (a) Describe the working of machine vision system. 6  
 (b) Discuss the methods used for position and velocity feedback in CNC machines. 8  
 (c) Explain AGV. 6
5. (a) Explain the CIM wheel in detail. 10  
 (b) Differentiate between hybrid CNC and straight CNC. 5  
 (c) Explain Axis identification for lathe and milling machine. 5
6. Write short note: 20
  - (a) Recirculating ball screw
  - (b) Advantages and disadvantages of CNC machines
  - (c) DC servomotor
  - (d) Automated Material handling
  - (e) Binary calculation in CNC controller.