

# GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2020

Subject Code:2172010

Date:21/01/2021

Subject Name:Automated Manufacturing - I

Time:10:30 AM TO 12:30 PM

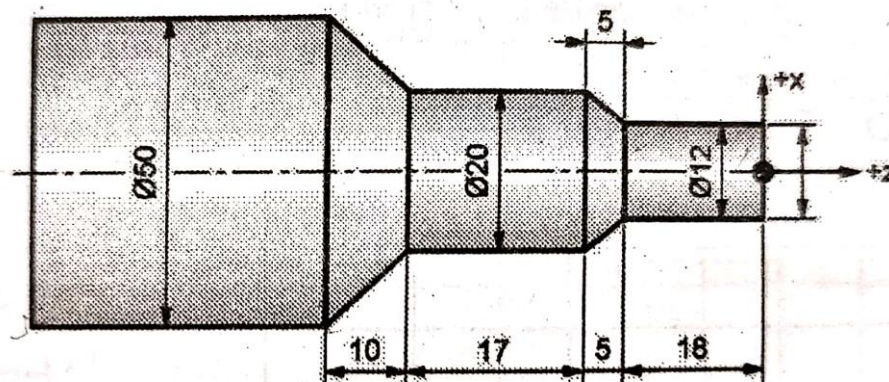
Total Marks: 56

Instructions:

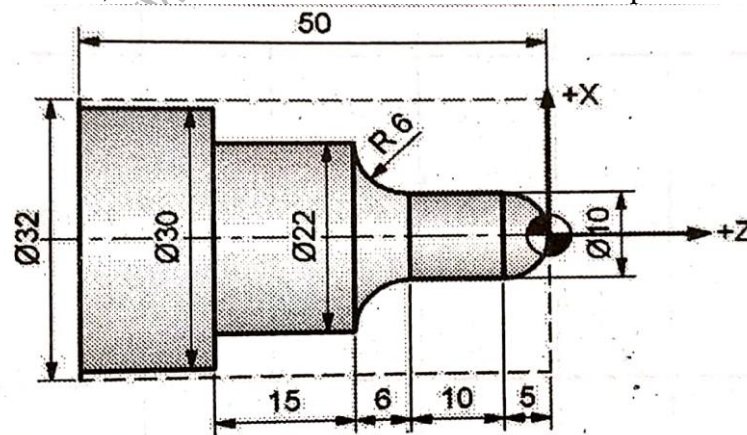
1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

MARKS

- Q.1**
- |     |   |           |
|-----|---|-----------|
| (a) | Explain three types of Automation.  | <b>03</b> |
| (b) | Write down advantages, limitations and applications of NC machine tools.  | <b>04</b> |
| (c) | Write a manual part program for finishing a forged component, as shown in the figure. Assume the speed and feed on the turning centre as 400 r.p.m and 0.35 mm/rev respectively. Assume 1 mm material is to be removed radially from external diameter. | <b>07</b> |



- Q.2**
- |     |  |           |
|-----|--|-----------|
| (a) | What is an Automated guided Vehicle system?  | <b>03</b> |
| (b) | Briefly differentiate between rail-guided vehicles and automated guided vehicles.  | <b>04</b> |
| (c) | Write a CNC program using appropriate G and M code to turn component, as shown in figure. Raw material: MS Ø32x50 mm; cutting speed: V=40 m/min; feed: f=0.1 mm/rev. Assume suitable depth of cut. | <b>07</b> |



- Q.3**
- |     |  |           |
|-----|--|-----------|
| (a) | Define rapid prototyping and Enlist its applications.                  | <b>03</b> |
| (b) | What is the advantage of a vertical storage carousel over a horizontal | <b>04</b> |

- (c) Explain with Example the reasons for implementation of automation in industries? **07**
- Q.4** (a) What is process planning? Enlist the two basic approaches in CAPP. **03**  
(b) What are the basic components of CNC system? Discuss any two of them. **04**  
(c) With suitable sketch explain closed loop and open loop control system. **07**
- Q.5** (a) What is canned cycle? **03**  
(b) Classify the CNC machine on the basis of Programming methods. **04**  
(c) Explain the principle of CMM. Describe the methods of operating and controlling a CMM. **07**
- Q.6** (a) List down limitations of Rapid prototyping. **03**  
(b) Draw a neat sketch of recirculating ball screw. State its advantages. **04**  
(c) What is ATC? Explain how tool is changed in CNC machine with suitable sketch. **07**
- Q.7** (a) What is selective laser sintering (SLS)? **03**  
(b) Differentiate between machine zero and part zero. **04**  
(c) What is the USA principle? List and explain the ten strategies for automation and process improvement. **07**
- Q.8** (a) State advantages of NC, CNC over Conventional machine tools. **03**  
(b) What are the advantages of Automated Guided Vehicles? **04**  
(c) Explain the functions of the following G codes. **07**  
G81,G94,G02,G74,G78

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