

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

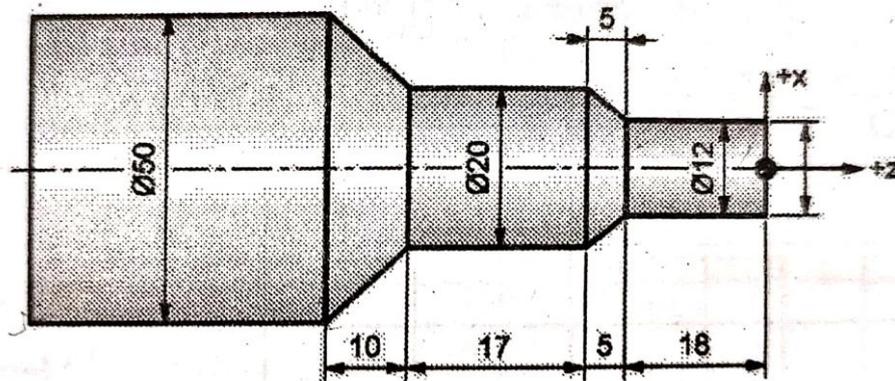
Total Marks: 56

Instructions:

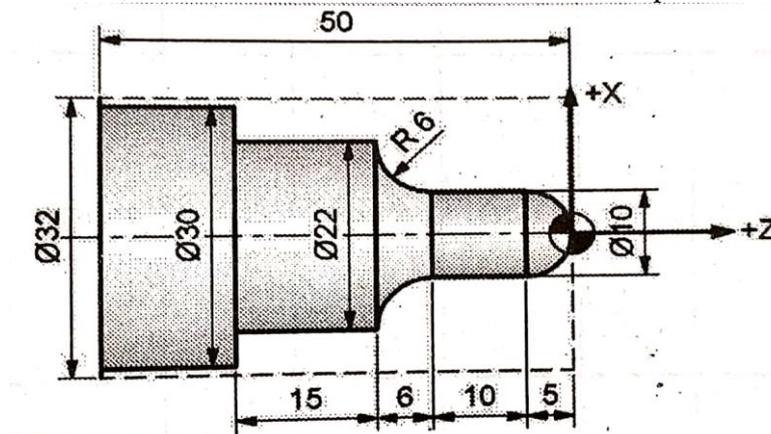
1. Attempt any **FOUR** questions out of **EIGHT** questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

MARKS

- Q.1**
- | | | |
|-----|---|----|
| (a) | Explain three types of Automation. | 03 |
| (b) | Write down advantages, limitations and applications of NC machine tools. | 04 |
| (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. | 07 |



- Q.2**
- | | | |
|-----|---|----|
| (a) | What is an Automated guided Vehicle system? | 03 |
| (b) | Briefly differentiate between rail-guided vehicles and automated guided vehicles. | 04 |
| (c) | Write a CNC program using appropriate G and M code to turn component, as shown in figure. Raw material: MS $\Phi 32 \times 50$ mm; cutting speed: $V=40$ m/min; feed: $f=0.1$ mm/rev. Assume suitable depth of cut. | 07 |



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

	carousel?	
	(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. G81,G94,G02,G74,G78	07
