

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER- V (New) EXAMINATION – WINTER 2019

Subject Code: 2154103

Date: 29/11/2019

Subject Name: CNC Machine and Metrology

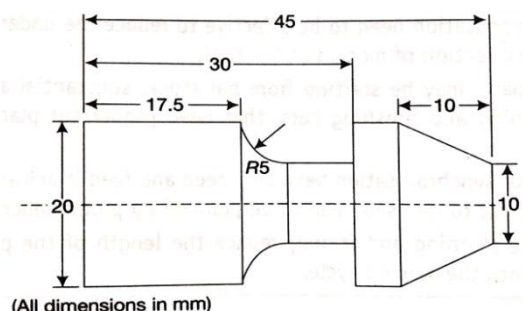
Time: 10:30 AM TO 01:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

| | Marks |
|---|-----------|
| Q.1 (a) How does the structure of NC/CNC machine tools differ from conventional machine tools? | 03 |
| (b) Classify CNC machines tools on the basis of : (i) Types of motion control (ii) According to programming Method. (iii) According to types of controllers | 04 |
| (c) Explain types of guide ways used in CNC machine tool .Describe any one with sketch the working and construction of guide ways/slide ways used in CNC machine tools. | 07 |
| Q.2 (a) Write short note on ATC? | 03 |
| (b) Explain work holding device use in CNC machine tool. Describe any one with sketch. | 04 |
| (c) List various feedback devices used in CNC machine. Explain working principle of Rotary encoder with neat sketch. | 07 |
| OR | |
| (c) Explain open-loop control system used in a CNC system with a schematic diagram. Draw a block diagram of velocity control loop for a closed loop control system. | 07 |
| Q.3 (a) Explain with neat sketch, axis designation for CNC turning centre. | 03 |
| (b) What are canned cycles? How are they useful in writing part programs. | 04 |
| (c) Explain Coordinate system used in CNC machine tools. | 07 |
| OR | |
| Q.3 (a) Which are formats used for part programming? Write word address format. | 03 |
| (b) What is the difference between canned cycle and subroutine? | 04 |
| (c) Write a CNC program using appropriate G and M code to turn component as shown in figure cutting speed $V=40\text{m/min}$ and feed=0.1, assume suitable data for depth of cut. | |



| | |
|---|-----------|
| Q.4 (a) Explain cutter radius compensation and tool length compensation. | 03 |
| (b) Explain types of statements used in APT language. | 04 |

(c) What do you mean by pyrometry? Enlist various types of pyrometers. **07**
www.FirstRanker.com OR www.FirstRanker.com

- Q.4** (a) Explain Inter changeability. **03**
(b) What is Sine Bar? Discuss working of Sine bar when component is of large size. **04**
(c) Sketch and working of autocollimator and write application. **07**
- Q.5** (a) Write the application and limitation of angle gauges. **03**
(b) State what is maximum and minimum material limits according to Taylor's principle. **04**
(c) What is CMM? Explain in brief with its constructional Features. **07**

OR

- Q.5** (a) What is measurement error? Classify errors and explain any one in short. **03**
(b) Explain Laser interferometer. State its Application. **04**
(c) Explain the working of Taylor Hobson Talysurf with neat sketch. **07**

www.FirstRanker.com