

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER- V EXAMINATION – SUMMER 2026

Subject Code:3154103

Date:09-06-2026

Subject Name:CNC Machine and Metrology

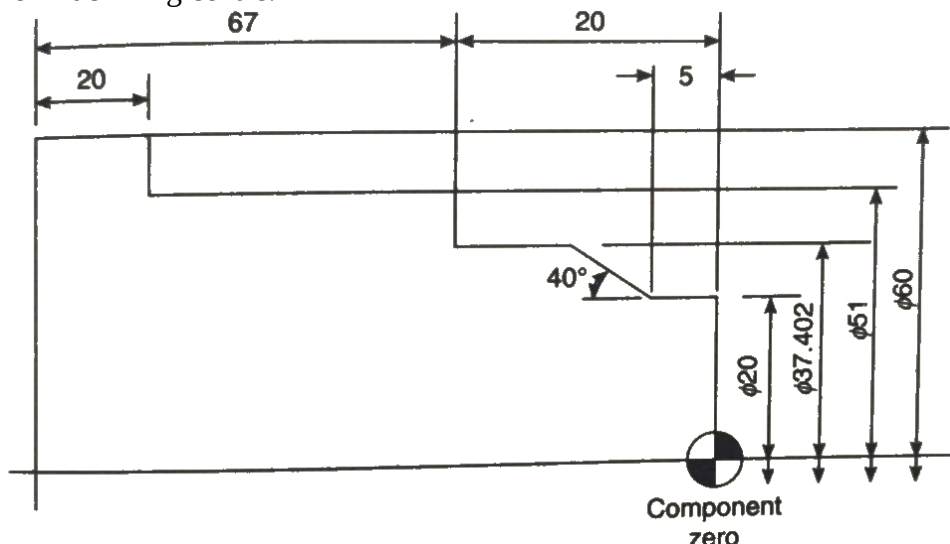
Time:02:30 PM TO 05:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) What is the rationale of learning the subject CNC Machine and Metrology?	03
	(b) Give two features and two application of CNC technology.	04
	(c) Classify CNC Machines. Also differentiate between NC,CNC and DNC concept.	07
Q.2	(a) Explain the principle of servo motor used in CNC machine.	03
	(b) Justify the economics of CNC.	04
	(c) Describe principle & working of (i) DC shunt motor (ii) 3 phase AC induction motor (iii) Stepper motor	07
	OR	
	(c) Describe work holding devices rotating and fixed work parts for CNC machine.	07
Q.3	(a) What is canned cycle?	03
	(b) Differentiate between incremental coordinates and absolute coordinate system.	04
	(c) What are G and M codes on CNC machine? Give example of any three G and M code.	07
	OR	
Q.3	(a) How tool length compensation and tool nose radius compensation are provided while part programming.	03
	(b) What are controllers? Give only names of controllers used in programming for machining centre.	04
	(c)	07



Write and create NC program for the above component. Stock is 65 mm diameter. All dimensions are in mm. Component is to be faced and then turned. Assume other suitable data if required.

- Q.4** (a) Differentiate between linear and angular measurement. **03**
(b) Explain bevel protractor with diagram. **04**
(c) Explain any one linear measuring instrument with neat sketch. **07**

OR

- Q.4** (a) Differentiate between accuracy and precision. **03**
(b) With diagram explain function of spirit level. **04**
(c) What is interchangeability and selective assembly? **07**

- Q.5** (a) Give full form of LASER. Also write advantages of LASER. **03**
(b) What is machine vision system? **04**
(c) What are the types of LASER interferometers? Also give application of laser interferometer. **07**

OR

- Q.5** (a) Write full form of CMM. Also explain basic concept of CMM. **03**
(b) State advantages of CMM. **04**
(c) Draw the schematic diagram of CMM and describe probe. **07**
