*Seat No.: _____* *Enrolment No._____*

# GUJARAT TECHNOLOGICAL UNIVERSITY

**M. E. - SEMESTER – I • EXAMINATION – SUMMER • 2014**

**Subject code: 712803N** **Date: 19-06-2014**

**Subject Name: Product Automation and CNC Technology**

**Time: 02:30 pm - 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.**

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|---|---|---|---|
| **Q.1** | **(a)** | What is Automation? Differentiate between Automation and Mechanization. Explain in detail various strategies adopted for automation. | **07** |
| | **(b)** | Automation is the key factor for industrial growth, Justify the statement giving suitable examples. | **07** |
| **Q.2** | **(a)** | Make a case study of implementing the automation system in automobile industries. | **07** |
| | **(b)** | ñCNC Machines are encouraging unemploymentò. Comment on the statement with reference to socio-technical environment. | **07** |
| | | **OR** | |
| | **(b)** | ñCNC Machining centre is considered to be a highly productive machineò. Give your justification | **07** |
| **Q.3** | **(a)** | Explain characteristics and scope of Mechanical, Electrical, Pneumatic, and Electronic and Hybrid automation systems with their comparative merits-demerits. | **07** |
| | **(b)** | Discuss parameters in detail which are responsible for reducing/eliminating the activities of operator in CNC technology. Discuss future trends in manufacturing? | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Elaborate in detail, factors which a production controller would consider while preparing a feasibility report to adopt CNC technology in the industry for the first time. Describe hardware configuration of a modern CNC system. | **07** |
| | **(b)** | Explain the concept of adaptive controls and discuss ACC system diagram for turning center. | **07** |
| **Q.4** | **(a)** | Why is a reciprocating ball in screw universally used in actuation system of CNC machine tools? Explain with neat sketch. | **07** |
| | **(b)** | Briefly describe the automatic tool changer used in CNC machining center. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Define interpolators. Describe the flow chart of software DDA interpolator for Linear interpolator and Circular interpolator. | **07** |
| | **(b)** | Explain do loops, parametric sub routines and Macros used in CNC programming with suitable example. | **07** |
| **Q.5** | **(a)** | (1) Explain any four canned cycles with suitable examples.<br>(2) Explain Geometric and motion statements with suitable examples, giving their format. | **07** |
| | **(b)** | What are the auxiliary statements in APT language? Explain with suitable examples any four auxiliary commands. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Explain the programming of CNC Machining centre with suitable example. | **07** |
| | **(b)** | Explain with neat sketch the working principle of wire cut EDM process, giving its process parameters and applications. | **07** |

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