Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – WINTER 2012

Subject code: 712803N Date: 12-01-2013

Subject Name: Product Automation & 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.**

Q.1	**(a)**	What are the basic components of a numerical control system? Briefly discuss the function of each component.	**07**
	(b)	Show schematically the different forms of numerical control, viz. open loop and close loop system.	**07**
Q.2	**(a)**	Define a Machining center. How does it differ from a turning centre? Discuss the various part of a machining center.	**07**
	(b)	What is stick-slip phenomenon in friction guide ways? Why friction guide ways are not used in CNC machine tools?	**07**
		OR	
	(b)	Draw a neat sketch of horizontal spindle machining center with a rotary table and specify the entire axis on it. State the rules of axes designation followed.	**07**
Q.3	**(a)**	Using neat sketch, explain the working principle of incremental and absolute optical encoders.	**07**
	(b)	List steps involved to produce an NC program. Briefly explain sequence number, preparatory function and miscellaneous function	**07**
		OR	
Q.3	**(a)**	Write a block diagram; explain the process of manual part programming.	**07**
	(b)	What is the difference between binary code, gray code and gray excess code in detail?	**07**
Q.4	**(a)**	Discuss the structure of an APT programme.	**07**
	(b)	What is adaptive control? What are its special characteristics? Explain the types of adaptive control.	**07**
		OR	
Q.4	**(a)**	What is post processor? Discuss the function of the postprocessor.	**07**
	(b)	What are the different strategies adopted in automation?	**07**
Q.5	**(a)**	Write the manual part program for the part shown in fig.1.Assume that the part is already rough turned and the tool is required to be programmed for finish turning. Assume spindle speed as 200 rpm, feed for machining as 0.2 mm/rev and Tool T03.	**07**
	(b)	What is wire EDM? Explain automatic wire threading in wire EDM.	**07**
		OR	
Q.5	**(a)**	Write the manual part program for the part shown in fig.2,Assume that the raw material is cylindrical blank of size ϕ 60 mm × 110 mm.	**07**
	(b)	What is cutter diameter compensation and tool length compensation?	**07**

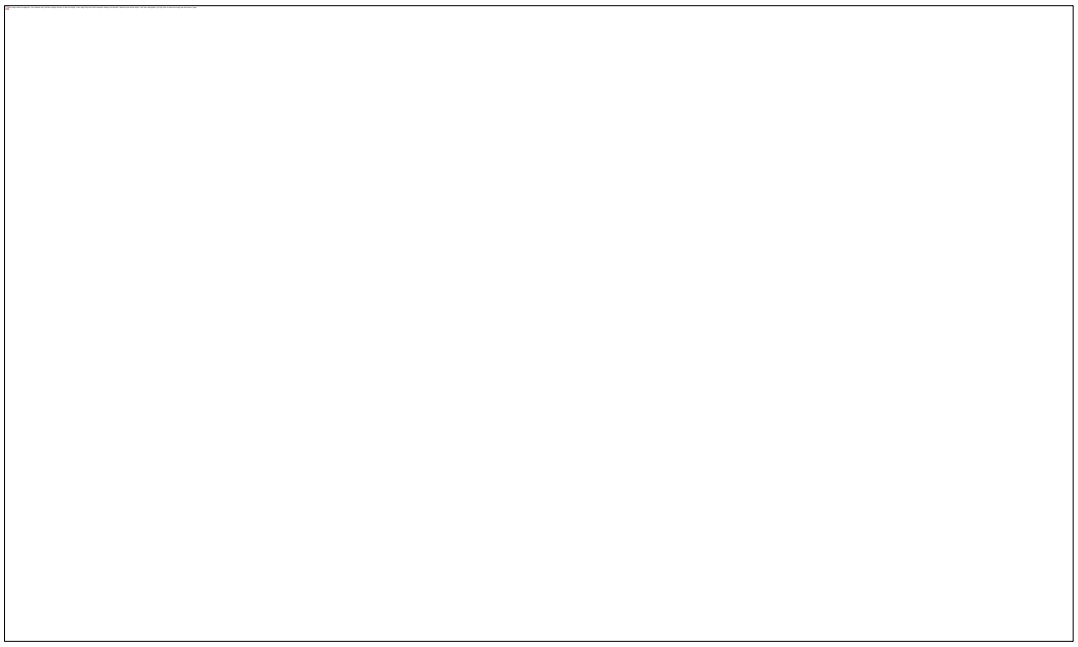

Fig.1

Fig.2

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