Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E –IIst SEMESTER–EXAMINATION – JULY- 2012

Subject code: 1720807 **Date: 12/07/2012**

Subject Name: Automation in production and Hydraulic control

Time: 10:30 am – 13:00 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)**	Compare fixed, programmable and flexible automation.	**07**
	(b)	Write a short note on gear pump.	**07**
Q.2	**(a)**	Sketch ISO symbol for followiong hydraulic control: (i) Flow control valve with variable output (ii) Pressure reducing valve (iii) 3/2 direction control valve (iv) Double acting cylinder with single piston rod (v) Hydraulic pump with two flow directions (vi) Reservoir (vii) Filter	**07**
	(b)	Explain with sketch Unit Built Machine	**07**
		OR	
	(b)	Define automated inspection. What are the three ways in which an inspection procedure can be automated?	**07**
Q.3	**(a)**	Discuss the influence of following parameters on mean conveying velocity of vibratory bowl feeder: (i) Frequency (ii) Vibration angle (iii) Track angle	**07**
	(b)	Define automation. Highlight the advantages and limitations of automation.	**07**
		OR	
Q.3	**(a)**	A 20-station transfer line is divided into two stage of 10 stations each. The ideal cycle time of each stage is T_c = 1.2 min. All of the stations in the line have the same probability of stopping, p = 0.005. We assume that the downtime is constant when a breakdown occurs, T_d = 8.0 min. compute the line efficiency for the following buffer capacities: (a) b=0, (b) b=∞.	**07**
	(b)	List the work-piece handling systems of a transfer line and describe with sketch any one of theme stating application.	**07**
Q.4	**(a)**	State advantages and limitations of hydraulic control system.	**07**
	(b)	Describe with net sketch construction and working of a variable delivery vane pump.	**07**
		OR	
Q.4	**(a)**	Describe with neat sketch construction and working of compound relief valve.	**07**
Q.4	**(b)**	Explain with neat sketch of Hydraulic Accumulator.	**07**
Q.5	**(a)**	Sketch hydraulic circuit naming each element for: An all hydraulic shaping machine.	**07**
	(b)	State and explain reason for following: (i) The poppet valves are not recommended as by pass valve. (ii) Hydraulic servo systems are closed loop system.	**07**
		OR	
Q.5	**(a)**	State and explain the use of following equipments sketching symbols as per the ISO recommandations: (i) Single acting cylinder returned by spring. (ii) Presssure relief valve.	**07**
	(b)	Sketch typical layout of a special purpose machine using standard units and explain in brief.	**07**

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