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GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VIII (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2182408 Date: 04/05/2017 Subject Name: Programmable Logic Controller for Power **Electronics(Departmental Elective III)** 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. **Q.1** What is PLC? State the need of PLC in automation. State advantages of PLC and 07 (a) List types of PLC. What is ladder programming? Enlist advantages of ladder programming. (b 07 **Q.2** List the input and output device used with PLC with their functions. 07 (a) **(b)** Explain in short: a) Relay instruction b) Data handling instruction. **07** Define the following terms related to PLC: a) Scanning cycle b) Scanning **(b)** 07 c) Scanning time d) Speed of execution. List the five standard PLC languages as defined by the International Standard for Q.3 (a) 07 Programmable Logic Controllers, and give a brief description of each. **(b)** Express the following equation in ladder logic program: 07 1.F = BC + AC' + AB + BCD2. F (a,b,c) = Σ (0,1,4,5,6) OR 0.3 Draw the timing diagram of retentive timer. Draw the timing diagram & write (a) 07 P.L.C. ladder logic equivalent of ON DELAY & DUAL OFF DELAY timer. Implement PLC ladder logic for 07 **(b)** 1. 2 to 4 decoder 2. 4:1 Multiplexer **Q.4** (a) Explain the PLC Digital Bit Functions and Applications with suitable example. 07 Explain PLC SKIP and MASTER CONTROL RELAY Functions with suitable **(b)** 07 example. OR **Q.4** Explain the PLC Sequencer Functions with suitable example. 07 (a) Explain PLC Data Move Systems with suitable example. 07 **(b) Q.5** Detail the various registers available in PLC. Also explain one application of shift 07 (a) register in PLC operation Explain the structure of PLC ladder diagram. Draw the Ladder diagram to control a 3 **07 (b)** phase induction motor using two pushbuttons. Explain the Timer and Counter functions in PLC with suitable Ladder diagram. **07 Q.5** (a) Detail the various registers available in PLC. Also explain one application of shift register **(b)** 07 in PLC operation
