Reg. No.									

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

VII SEMESTER B.TECH (ELECTRICAL & ELECTRONICS ENGINEERING)

MAKEUP EXAMINATIONS, DEC 2016 - JAN 2017

SUBJECT: INDUSTRIAL AUTOMATION & CONTROL [ELE 437]

REVISED CREDIT SYSTEM

Time: 3 Hours **Date: 06 January 2017** **MAX. MARKS: 50**

Instructions to Candidates:

- Answer **ANY FIVE FULL** questions.
- Missing data may be suitably assumed.

1A. State the major aspect in which sequence control systems differ from analog control systems. ***(05)***

1B. Describe the principle of ratio control, Give two possible arrangements for achieving ratio control. ***(05)***

2A. With neat diagram describe the physical organization of hardware in the PLC. ***(05)***

2B. Design a ladder logic program for the process control system which contains three Motor Y0, Y1, Y2 where Y0 is Oil Motor, Y1 is Auxiliary Motor, Y2 is Main motor connected Sequentially with delay and X1 is start Push button and X0 is Stop switch that is starting the oil pump motor immediately when START is pressed. The main motor will be started after a 10 sec delay and then the auxiliary motor after a 5 sec delay. In addition, stopping all motors immediately when STOP is pressed. Use on delay timers T0 is 10 second timer with 100ms timer base, T1 is 5 second Timer with 100ms timer base. ***(05)***

3A. With neat diagram explain air-to-close control valve, Give an example. ***(05)***

3B. Explain the basic principle and working of Hydraulic actuators employed in Hydraulic system. ***(05)***

4A. Why PLCs are recommended for SCADA system justify your answer with example. ***(05)***

4B. Describe the characteristics of Distributed system with typical example. ***(05)***

5A. List the difference between Modbus and Profibus. ***(05)***

5B. With neat diagram explain I^2C Bus configuration and protocol. ***(05)***

6A. Explain the different types of tasks undertaken by an RTOS. Which task is time critical Justify your answer in terms of utility of the system. ***(05)***

6B. Define loop-integrity check and explain how a HART data can be read to a non-HART system. ***(05)***