**Code No: C7507** 

## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD M.TECH I SEMESTER EXAMINATIONS, APRIL/MAY-2012 PROGRAMMABLE LOGIC CONTROLLERS AND THEIR APPLICATIONS (CONTROL SYSTEMS)

Time: 3hours Max. Marks: 60

## Answer any five questions All questions carry equal marks

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- 1.a) What are the components of a PLC?
  - b) What are the functions of PLC CPU? Explain their operational sequence.
- 2.a) Explain a typical PLC output scheme
  - b) Design the operation of a drill press module and draw the necessary Ladder diagram.
- 3.a) Explain the following
  - i) AND gate and relay and PLC equivalents
  - ii) NOR gate and relay and PLC equivalents
  - b) Discuss about ladder diagrams and sequence listings.
- 4. What are the characteristics of PLC registers? Explain the function of any two types of PLC registers in detail.
- 5.a) How many configurations are there for PLC counter functions? Explain.
  - b) Discuss the application of a dual counter for parts to be counted on a conveyor belt. Assume required design considerations.
- 6.a) Explain the JUMP with NON-RETURN with an application.
  - b) Explain the FAL function of a PLC with a schematic of its operations.
- 7.a) How do you change the status of bit pattern of a register? Explain.
  - b) Using a PLC sequencer and timing, explain the following dishwasher application.
    - > Soap release solenoid
    - >Input valve for hot water
    - > wash impeller operation
    - > Drain water valve
    - >Drain pump motor
    - >Heat element for drying cycle
- 8. Write short notes on the following
  - a) Input output devices connected to PLC
  - b) PLC analog signal processing
  - c) PLC Master control Relay

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