



COLLEGE OF ENGINEERING & TECHNOLOGY

Department: Electrical & Computer Control Engineering

Lecturer : Prof. Dr. Hamdy Ashour

Course : Automated Industrial Systems (I)

Course Code: EE 512

Marks: 40

Date : 24/5/2015

Time: 2 hours

Final Exam

Answer **ALL** the following questions

(1) (9 Marks)

(A8, B4, C16)

- Use simple sketch to show the main components of a PLC system.
- Discuss using industrial examples the main types of automated subsystem strategies.
- Compare between voltage and current analog measurement signals
- Show what is meant by:-
 - PLC scan cycle
 - STL and FBD programming languages
 - MCC definition and functions

(2) (9 Marks)

(A4, B15, C3)

A rolling machine is driven by a DC motor in both forward and reverse directions, while a lubricating pump is operated by direct on line fed 3-ph induction motor. The operation sequence is:-

- If the start push button is pressed, start the lubricating pump then
- after 5 sec operate the rolling in forward direction for 50 sec then
- Stop the rolling for 10 sec then
- Operate the rolling in reverse direction for 50 sec then
- Stop the rolling and the lubricating pump

**If the stop pushbutton is pressed at any time, stop both motors.

- Design the power circuits of the two motors
- Design the required control circuit (using relays, and timers)
- If the PLC is required to replace the relay logic , define input and outputs then write down the corresponding PLC program to do the job

(3) (8 Marks)

(A20, A27, A31)

Define inputs/ outputs then write down the minimum PLC programs to perform the applications, just after pressing the main start / stop switch, described in i- Table 1. ii- Table 2

Selector	Position1	Position2	Position3	Position4
Motor1	ON	ON	ON	OFF
Motor2	ON	ON	OFF	OFF
Motor3	ON	OFF	OFF	OFF

Table 1

Steps	step1(6s)	step2(6s)	step3(6s)	step4(6s)
Motor1	ON	ON	ON	OFF
Motor2	ON	ON	OFF	OFF
Motor3	ON	OFF	OFF	OFF

Table 2

Members of course Examination Committee:	Signature:	Date:
Lecturer: Prof. Hamdy Ashour		16-5-2015
Course Coordinator : Dr Ahmed El-Shenawi		16-5-2015
Head of Department: Prof. Hamdy Ashour		16-5-2015

