Register Number: ……..

B.E DEGREE EXAMINATIONS: APRIL/MAY 2012

Sixth Semester

MECHATRONICS ENGINEERING

MCT115: Programmable Logic Controller

Time: Three hours **Maximum Marks : 100**

Answer ALL Questions:-

PART A (10 x 1 = 10 Marks)

1. The input section of PLC consist of _____
   a) Power section & Voltage b) Power section & Logic
   c) Power section & processing d) none of these
2. Initially PLC was used to replace _____
   a) Relays b) Wire c) Human d) software
3. _____ bit is true in shift instruction whenever negative number is entered in the length
   a) 15^{th} b) 13^{th} c) 11^{th} d) 10^{th}
4. The order of PLC scans on the basic of short to long period _____
   a) Program Scan, I/O scan b) I/O scan, program scan c) Equal period d) None of these
5. ____ Instruction is used to test whether values are within or outside the specified range.
   a) MVM b) LIM c) FAL d) LEQ
6. _____are two ways in which I/O is incorporated into the PLC
   a) Fixed & variable b) Single & multiple c) Fixed & Modular d) None of these
7. Maximum number of contacts per rung _____
   a) 6 b) 7 c) 9 d) 10
8. The MOV instruction is to be used to copy the information stored in word N7:20 to N7:35._____ address is entered into the source and the destination.
   a) N7:20, N7:35 b) N7:35, N7:20 c) a or b d) None of these
9. Preparing a control process for startup is called as
   a) commissioning b) monitoring c) PLC controlling d) process enabling
10. The first step in troubleshooting is to identify
    a) the problem b) the problem and source c) the programming errors d) the source

PART B (10 x 2 = 20 Marks)

11. State two ways in which I/O is incorporated into the PLC.

12. What are the main parts of programmable logic controller (PLC)?
13. What is the function of PLC input module?
14. Discuss the advantage of a processor that uses flash memory.
15. What are the limitations of Ladder programming?
16. What is the function of internal control relay?
17. When line voltage variations to the PLC power supply are excessive, what can be done to solve the problem?
18. What is a watchdog timer?.
19. What methods are used to keep enclosure temperatures within allowable limits?
20. What is meant by flexible manufacturing system?

PART C (5 x 14 = 70 Marks)

21. a) Explain the main function of each of the following major components of a PLC in detail
    (i) Processor module (CPU)
    (ii) I/O modules
    (iii) Programming device
    (iv) Power supply module

(OR)

b) (i) Discuss about the types of PLC system. (7)
(ii) List the seven distinct advantages that PLCs offer over the conventional relay control system. (7)

22. a) List and describe the function of the hardware components used in PLC systems

(OR)

b) Describe the general classes and types of PLC memory devices

23. a) Design a PLC program and draw the schematic for a conventional hardwired circuit that will perform the following circuit functions using two break-make pushbuttons:
    - Turn on light L1 when pushbutton PB1 is pressed.
    - Turn on light L2 when pushbutton PB2 is pressed.
    - Electrically interlock the pushbuttons so that L1 and L2 cannot both be turned on at the same time.

(OR)

b) Explain in detail about data handling instructions.

24. a) Explain in detail about DCS and DCS integration with PLC & computers.

(OR)

b) Discuss in detail about MAP and TOP.

25. a) Explain about the application of PLC as robot controller.

(OR)

b) Explain in detail about PLC maintenance and troubleshooting.

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