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Total No. of Pages : 02

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B.Tech.(EIE) (2011 & Onwards E-I) (Sem.–6)

PROGRAMMABLE LOGIC CONTROLLERS & APPLICATIONS

Subject Code : EI-310/DE-1.5

M.Code : 58040

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Q1 Answer briefly :

a) Differentiate between a PLC and a personal computer.

b) The programmable controller operates in a real time. What does this mean?

c) What are the most important factors in selecting the size of a PLC?

d) What is the function of watchdog timer in a PLC?

e) Name any four input and output devices suitable for the input and the output modules.

f) What determines the maximum speed of transitions that a PLC counter can count? Why?

g) What are the disadvantages of a PLC?

h) What is the function of the internal control relay?

i) What is a drum sequencer?

j) Why do PLCs execute memory checking routines?

SECTION-B

Q2. Explain the scan cycle of a PLC.

Q3. Write the ladder programs for the NAND, NOR and XOR logic functions.

Q4. Draw the schematic diagram of the dc input module and explain each section.

Q5. Develop a sequencer control system to operate a basic two-axis robo.

Q6. Explain the various timers and counters available in a PLC.

SECTION-C

Q7 a) Explain the memory organization of a PLC. Name the different types of data files. 5

b) Make a sequential function chart and write a ladder program for following the operation of a start switch (S_1), after which the tank is filled by opening a valve (V_1) until a level switch (L1) is triggered, then the tank is drained by opening drain valve (V_2) until level switch (L2) is triggered, then the sequence is repeated. 5

Q8 a) Draw the schematic diagram of an ac output module. How the high rating devices are interfaced with the output module in a PLC. 5

b) Write a ladder program to implement the following process.

When the lights are turned off in a building, an exit door light is to remain on for an additional 2 min time and the parking lot lights are to remain on for an additional 3 min after the door light goes out. 5

Q9. (a) How the analog devices are interfaced with a PLC? 3

(b) What do mean by latching? Draw the ladder program for the start stop of a motor. 2

(c) Explain how the proportional, integral and derivative control is implemented with a PLC. 5

NOTE : Disclosure of identity by writing mobile number or making passing request on any page of Answer sheet will lead to UMC case against the Student.