Hall Ticket Number:

Code No. : 22716

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD
M.E. (EEE: CBCS) II-Semester Main Examinations, June-2018

(Power Systems & Power Electronics)

Programmable Logic Controllers and their Applications

Time: 3 hours   Max. Marks: 60

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

1. Name any 2 digital and 2 analog input devices connected to PLC.
2. List the important units of a PLC.
3. There are 2 machines, each with its own start-stop buttons. Only one may run at a time. Construct a circuit appropriate interlocking.
4. What is the function of EX-OR Gate?
5. Draw and discuss the Timer ON delay function.
6. Define the PLC Multiplication function.
7. Illustrate the SKIP function of a PLC.
8. Define the concepts of Matrix function.
9. Differentiate between Discrete and Analog Operation of a PLC.
10. Illustrate the procedure of Analog Signal Processing in PLC.

Part-B (5 × 8 = 40 Marks)

11. a) List out 4 advantages and disadvantages of PLC.   [4]
    b) Explain the working of a PLC Output Module Layout, with a neat block diagram.   [4]

12. a) With neat diagram explain PLC Scanning in detail.   [4]
    b) Implement 4x1 multiplexer in Ladder diagram.   [4]

13. a) Describe the UP-Down Counter.   [3]
    b) When the lights are turned off in a building, an exit door light is to remain on for an additional 2 min, and the parking lot lights are to remain on for an additional 3 min after the door light goes out. Write a ladder program to implement this process.   [5]

14. a) What is the function used for moving a large block of PLC data? Explain in detail.   [3]
    b) Explain basic Two-axis Robot with PLC sequencer control.   [5]

15. a) Describe PID function of PLC in detail.   [4]
    b) Explain the PLC Analog Output application examples.   [4]
       • Analog In/Discrete out.
       • BCD in/BCD or Analog output.

16. a) Illustrate the PLC Power Supply Module.   [4]
    b) Explain with Ladder diagram, the forward and reverse direction control of a motor with a Fail-Safe operation.   [4]

17. Answer any *two* of the following:
    a) List and define the six basic COMPARE functions.   [4]
    b) Describe working of a jump with nonreturn instruction.   [4]
    c) Explain different methods of PID tuning.   [4]

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