

B.Tech Sem – VII (2007 Course) (Electronics Engg.) : SUMMER - 2019
SUBJECT: PROGRAMMABLE INDUSTRIAL CONTROLLERS

Day : Monday
Date : 13/05/2019

S-2019-3188

Time : 02.30 PM TO 05.30 PM
Max. Marks : 80

N.B:

- 1) **Q.No.1** and **Q.No.5** are **COMPULSORY**. Out of the remaining questions attempt **ANY TWO** questions from each section.
 - 2) Answers to both the sections should be written in *SAME* answer books.
 - 3) Figures to the right indicate **FULL** marks.
 - 4) Assume suitable data if necessary.
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SECTION – I

- Q.1** a) Draw the relay logic and PLC Logic for following gates [04]
i) NOT ii) NOR iii) XOR iv) NAND
- b) Explain RTD with a simple example, draw the ladder for the same. [05]
- c) With a suitable diagram, explain the functions of OSR instruction. [05]
- Q.2** a) Explain PLC CPU with neat diagram. [06]
- b) Describe the function of PLC processor. What are the various operating modes in processor? [07]
- Q.3** a) Explain & draw the ladder diagram for [07]
i) Two lights are to flash ON and OFF at a different intervals. One is ON and OFF for 4.2 sec and another for 9.8 sec
ii) A short push button will switch ON a motor & another stop PB and will switch off the motor. Use latch instruction for ladder.
- b) Design a counter to count the number of vehicles passing a major intersection in a city. Draw a ladder diagram for this system. [06]
- Q.4** a) Explain principles of PID? What is the significance of PID? [07]
- b) Differentiate between digital input/output and analog input/output. [06]

SECTION – II

- Q.5** a) Briefly discuss what is meant by networking of PLCs. [05]
- b) State the main characteristics of Actuator sensor interface (AS-Interface) [05]
- c) What are the advantages & disadvantages of the bus topology? [04]

P.T.O.

- Q.6** a) A signal varies from 0 to 80V & represents 100% input voltage. Using 0-5V DC I/P module, trace are 42V AC. Calculate the corresponding digital output on a 256 steps. **[08]**
- b) Give the specification of output discrete module. **[05]**
- Q.7** a) Compare the characteristics of device net and control net networks. **[07]**
- b) Give the advantages and disadvantages of solid state switching. **[06]**
- Q.8** Draw the block diagram and PLC ladder diagram for control circuit of a starting scheme of a mill motor in a boiler plant for given instruction below. **[13]**
- a) The FD fan is ON.
 - b) Furnace oil level interlock is satisfied.
 - c) When (i) &(ii) satisfied, a master fuel relay (MFR) is energized.
 - d) These energies an auxiliary relay MFRA and indication lamp. L indicating that “Interlock -stage I ready”.

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