

B.Tech Sem – VII (2007 Course) (Electronics Engg.) : WINTER - 2018
SUBJECT: PROGRAMMABLE INDUSTRIAL CONTROLLERS

Day : Wednesday
Date : 28/11/2018

W-2018-2923

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

N. B. :

- 1) **Q.No1 and Q. No.5 are COMPULSORY.** Out of the remaining attempt **ANY TWO** questions from each sections.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answer the both sections should be written in the **SEPARATE** answer book.
- 4) Assume suitable data if necessary.

SECTION-I

- Q.1 a)** Use two or more LIM functions to check a varying value for the following (06)
value if true or False.
- | | |
|--------------------|-------|
| Less than 52 | True |
| 52 to 59 | False |
| More than 59 to 71 | True |
| 72 to 86 | False |
| 87 to less than 99 | True |
| 99 and above | False |
- b)** Explain how JUMP difference from skip and MCR function. (04)
- c)** What is input module? How would you specify requirement of input module? (04)
- Q.2 a)** Draw electrical and PLC ladder diagram for given instruction. (07)
- i) When SW1 goes ON L1 goes ON.
 - ii) A timers T1 goes ON.
 - iii) After 25 seconds L2 goes ON.
 - iv) When stop is operated system goes OFF.
- b)** State advantages and disadvantages of fixed PLC and modular PLC. (06)
- Q.3 a)** Design a ladder diagram that will control a stepper motor so that it moves 10 (07)
steps Forward, wait for 20 seconds and then course the motor to move 10
steps in reverse direction.
- b)** What is the significance of Math instruction? Give example how you can use (06)
it for 32- bit addition.
- Q.4 a)** What is shift register? How will you use shift register to rotate a light pattern (07)
right or left? How is it different from sequencer?
- b)** With suitable examples explain the application using following PLC (06)
instructions.
- | | | |
|--------|---------|----------|
| i) SUB | ii) BSL | iii) FRD |
|--------|---------|----------|

P.T.O.

SECTION-II

- Q.5** a) What is meant by sinking and sourcing? Give example. (05)
- b) Brief the structure of complex automated control system. (05)
- c) What is the role of PLC in automation? Discuss its significance. (04)
- Q.6** a) A BCD input (0-999) is received by input module. A fixed value of 190 is to be subtracted from the value received and result is sent to 0-9999 display. Also the O/P value is to be placed in a 0 to 20 mA analog O/P module. Draw PLC ladder diagram. (08)
- b) Draw diagram to show interface of logic circuit with power circuit (Single phase). (05)
- Q.7** a) What is foundation field bus industrial network? Where it is used? Compare foundation field bus to OSI 7 layer communication model. (07)
- b) Draw the protocol architecture of profibus and state the general features of profibus. (06)
- Q.8** In a certain industrial process a part is placed on conveyor at position 1, it automatically moves to position 2. Upon reaching position 2, it stops and is stamped. After stamping it automatically moves to position 3. It stops at 3, where the part is removed manually from the conveyor. Assume only one part is on conveyor at one time. Add limit switches, interlocks push buttons and other device if required. Create a PLC ladder diagram. (13)

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