

22384

24225

3 Hours / 70 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.

Marks

1. Attempt any FIVE of the following :

10

- (a) What is Industrial Automation ?
- (b) List any four types of Automations used in industries.
- (c) List five layers of Industrial automation hierarchy model.
- (d) Name any two i/p & o/p devices used with PLC.
- (e) Give wiring guidelines for PLC.
- (f) Define rack & enclosure w.r.t. PLC installation.
- (g) List any four programming languages used with PLC.

2. Attempt any THREE of the following :

12

- (a) Compare Hard & Soft automation.
- (b) Explain the types of PLC redundancy.
- (c) Draw block diagram of generalized PLC and explain function of each block in brief.
- (d) Give function of following w.r.t. PLC :
 - (i) Memory
 - (ii) CPU



- 3. Attempt any THREE of the following : 12**
- (a) Describe the interfacing diagram of output module of PLC with standard o/p device.
 - (b) Draw a symbol of ON delay timer instruction. State the function of following :
 - (i) Enable bit (EN)
 - (ii) Done bit (DN)
 - (iii) Timer timing bit (TT)
 - (c) Differentiate between fixed PLC & modular PLC.
 - (d) Explain format of Bit type instructions w.r.t. PLC.
- 4. Attempt any THREE of the following : 12**
- (a) Draw a block diagram of Power supply used in PLC and explain function of it's each block.
 - (b) Describe in brief memory organization in PLC.
 - (c) Draw a PLC ladder diagram for
 - (i) AND gate
 - (ii) OR gate
 - (iii) EX-OR gate
 - (iv) NAND gate
 - (d) Explain the format of relay type instruction w.r.t. PLC.
 - (e)
 - (i) List different control panel accessories.
 - (ii) Draw the wiring diagram for 240V AC lamp with PLC module.
- 5. Attempt any TWO of the following : 12**
- (a) Describe Sinking & Sourcing concept in DC i/p module of PLC.
 - (b) Draw ladder diagram for tank level control. (assume required condition & mention it.)
 - (c) Implement ladder logic for 1 : 4 Demux.
- 6. Attempt any TWO of the following : 12**
- (a) Explain format of comparison, logical & data handling instruction w.r.t. PLC.
 - (b) Draw ladder diagram for following expression :
 - (i) $Y = AB + CD + EF$
 - (ii) $Y = (A + B + C') EF$
 - (c) Draw ladder diagram for automatic bottle filling system. Assume suitable system design for the same.
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