

22640

23124

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.
- (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

- 1. Attempt any FIVE of the following :** **10**
- a) State types of redundancy in PLC system. (Any two)
- b) State needs of Automation. (Any four)
- c) Draw function block of On-delay timer instruction. (Non retentive type) with delay 10 second.
- d) State the need of HMI in SCADA.
- e) Define with respect to SCADA
- i) Tags
- ii) Items
- f) Draw function block of COUNT-UP counter instruction for counting of 10 items.
- g) List the different types of Tags in SCADA.

P.T.O.

- 2. Attempt any THREE of the following :** **12**
- a) State any two of each advantages and disadvantages of PLC.
 - b) Explain A.C. input module of PLC with block diagram.
 - c) Explain down counter instruction of PLC with waveforms.
 - d) Draw block diagram of analog input module. Explain function of each block in brief.
- 3. Attempt any THREE of the following :** **12**
- a) Draw diagram for -
 - i) Sourcing Push button (NO) with sinking I/P module.
 - ii) Sourcing O/P module with sinking d.c. lamp.
 - b) Explain any two compare instruction of PLC, with example.
 - c) Develop ladder diagram following sequences.
 - i) When start PB is pressed Motor M_1 starts.
 - ii) After 08 seconds Motor M_2 starts.
 - iii) After 05 seconds Motor M_3 starts.
 - iv) When STOP PB is pressed, all Motors stops immediately.
 - d) Develop a ladder diagram that will cause output 'Q' to be on when push button A is ON or either B or C are ON.
- 4. Attempt any THREE of the following :** **12**
- a) Draw the block diagram of power supplies in PLC. State function of each block.
 - b) Draw block diagram of SCADA. Explain Function of each block in brief.
 - c) Explain the function of done (DN), enable (EN) and Timer time (TT) bit of timer in PLC.
 - d) Explain steps in creation of screen of SCADA for simple object.
 - e) State benefits of SCADA. (Any four)

5. Attempt any TWO of the following :**12**

- a) Draw block of analog output module. Write its any four specifications.
- b) Draw ladder diagram for following sequence -
 - i) Tank level is filled upto level limit L_{up} by valve V_1 in Line of Input pipe above tank.
 - ii) Empty the tank upto Level limit L_{DN} by valve V_2 in the outlet pipe line at bottom of tank.
 - iii) Cycle repeats from (i).
 - iv) Systems starts when start PB is pressed. When stop PB is pressed, all process stops immediately. Assume suitable required data.
- c) Draw ladder diagram for traffic light control system with following sequence.
 - i) When start PB is pressed, system starts with Red Lamp ON for 08 seconds.
 - ii) After that Yellow Lamp is ON for 04 seconds.
 - iii) After that Green Lamp is ON for 06 seconds.
 - iv) When stop PB is pressed systems immediately.

6. Attempt any TWO of the following :**12**

- a) Differentiate SCADA & PLC.
 - b) Develop level control sys. application in SCADA. List the tags to be interlinked with PLC.
 - c) Develop ON.Off “control of one lamp by one switch” application in SCADA.
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