22534

12425

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

Marks

1. Attempt any FIVE of the following : **10**

(a) Define DCS and mention its features.

(b) List different programming languages used with PLC.

(c) Compare fixed and modular PLC (any two points).

(d) Draw PLC I/O addressing format.

(e) List the types of comparision instructions used in PLC (any two).

(f) List functions of electric drives (any two).

(g) List different editors used in SCADA (any two).

2. Attempt any THREE of the following : **12**

(a) Compare fixed and programmable automation on any four points.

(b) Draw block diagram of PLC system and explain each block.

(c) State I/O module selection criteria for PLC (any four).

(d) Draw a symbol of ON-delay timer, state the function of following :

(i) Timer base bit

(ii) Preset bit

(iii) Enable bit

3. Attempt any THREE of the following : **12**

(a) With the help of neat sketch, explain redundancy in PLC.

(b) Draw generalized block diagram of electrical drives and explain in brief.

(c) With the help of block diagram, explain typical SCADA system. (SCADA systems)

(d) List any four input devices and four output devices that can be connected to PLC.

4. Attempt any THREE of the following : **12**

(a) Explain steps for linking SCADA object with PLC ladder program using OPC.

(b) Compare PLC and SCADA on any four points.

(c) Describe memory organization of PLC with neat sketch.

(d) Explain (V/F) control method of AC drives with neat diagram.

(e) Explain how SCADA is used in pipeline control systems with suitable diagram.

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

(a) (i) Define Electric Drive.

(ii) Explain four quadrant operation in electric drive.

(iii) List applications of electric drives which are based on four quadrant operation.

(b) (i) Develop a ladder logic diagram for application of staircase, switching ON/OFF the LAMP, whether they are at Ground floor or first floor of the staircase as shown in Fig. 5 (b) (i) :

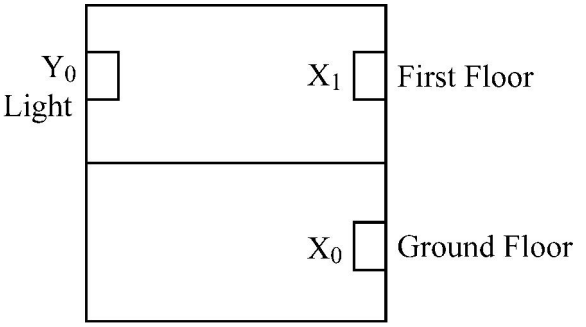

Fig. 5 (b) (i)

(ii) Develop logic diagram for application of Half Adder Circuit as shown in Fig. 5 (b) (ii) :

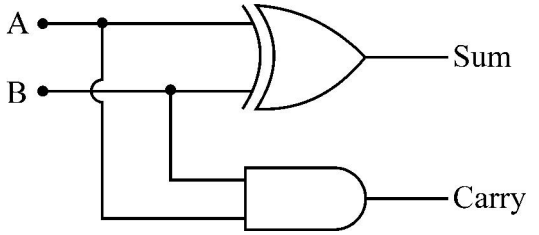

Fig. 5 (b) (ii)

(c) Draw a neat wiring diagram of following I/o devices to interface with appropriate PLC module :

(i) PB – (NO Type)

(ii) Limit Switch (NC Type)

(iii) Lamp 24 V DC

(iv) Fan 230 V AC

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

(a) Explain steps involved in developing SCADA application in Traffic light control systems.

(b) Design ladder diagram for TANK Level control systems with two sensor and one control valve.

(c) Develop ladder diagram for given logical expressions :

(i) $Y = AB + BC + CD$

(ii) $Y = (A + B + C)(DE)$

(iii) $Y = \overline{A}(B + C) + B(A + \overline{C})$
