

B.TECH.**THEORY EXAMINATION (SEM-VIII) 2016-17****INDUSTRIAL AUTOMATION-I****Time : 3 Hours****Max. Marks : 100****Note : Be precise in your answer. In case of numerical problem assume data wherever not provided.****SECTION-A**

1. Attempt all parts. Write answer of each part in **short**. **(2 × 10 = 20)**

- (a) Define Automation and state its type.
- (b) Describe different types of controllers used in Industrial Automation.
- (c) What kind of different Automation strategies are used in industry?
- (d) What are the advantages of flexible automation?
- (e) Explain SCADA.
- (f) Define different levels of automation with flow chart.
- (g) Compare hard automation with soft automation.
- (h) What do you mean by Data Acquisition?
- (i) Difference between Hardware, Software and Firmware.
- (j) What is relay and solenoids?

SECTION-B

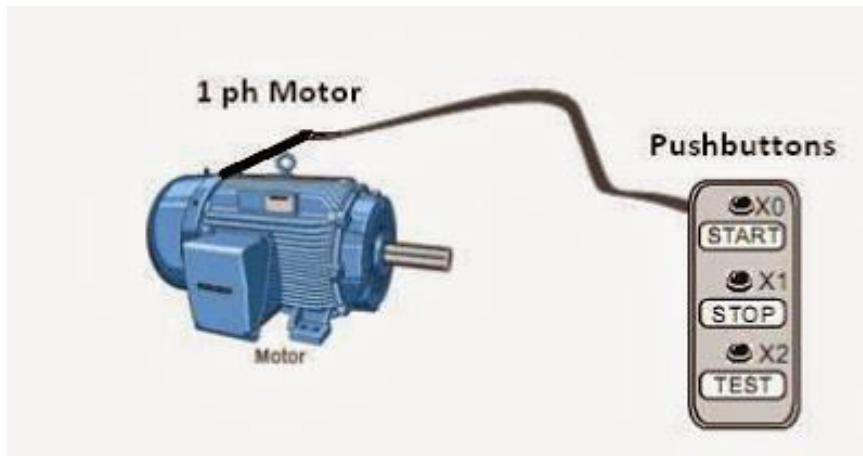
2 Attempt any **five** questions from this section **(10 × 5 = 50)**

- (a) Discuss architecture of Programmable Automation Controller with the help of schematic diagram
- (b) Draw the electrical circuit along with Ladder Logic representing following logic gates;
 - (i) AND
 - (ii) OR
 - (iii) NOT
 - (iv) NAND
- (c) What is an HMI and what is the need of HMI?
- (d) Compare hard automation with soft automation. What are the advantages of flexible automation?
- (e) Draw symbols for
 - (i) Pressure Relief Valve
 - (ii) 2/2 valve which has actuator of push button and spring.
 - (iii) 4/2 valve
 - (iv) Direction valve
- (f) Discuss in detail the working of Mechanical switch i.e. Relay.
- (g) With the help of suitable example of ladder logic, explain the concept of latching.
- (h) Discuss architecture of Programmable Automation Controller with the help of schematic diagram

SECTION – C**Attempt any 2 parts from the following : (15x2=30 Marks)**

3. Controlling the running state of the 1 ph motor by pressing START and STOP pushbuttons i.e. motor should remain in ON state after START pushbutton is pressed and should OFF when STOP pushbutton is pressed. Checking if the motor is running normally by pressing TEST pushbutton.

Draw ladder logic.



4. Explain the following:

- (i) Sequential function chart.
- (ii) Functional block diagram.

5. Discuss the relevance of SCADA in current scenario of industrial modernization. What are the sub-systems of SCADA discuss in detail.