



PART B — (5 × 16 = 80 marks)

11. (a) (i) Explicate with an example advantages of PLC over relay logic. (6)  
(ii) Explain the analog and discrete I/O modules of PLC. (10)

Or

- (b) (i) Write down the steps to be considered for designing a 16 analog input and 5 digital input, 5 analog output and 2 digital output PLC. (8)  
(ii) What is the purpose of input status table and output status table in PLC and write any PLC program using timer and counter applications? (8)
12. (a) (i) Classify the types of instructions in PLC and mention its uses. (10)  
(ii) How to use a PC as a PLC – Explain with an example. (6)

Or

- (b) (i) Mention the inputs and outputs used in a bottling application and write a program using relay logic (Use Minimum 6 I/O, 2 Timers, 1 Counter). (8)  
(ii) Write a PLC ladder diagram for a process plant. Assume total of 5 inputs and 6 outputs. Mention the I/Os. (8)
13. (a) (i) Describe about direct digital control systems with examples. (10)  
(ii) Explain the protocols used in the computer controlled systems and mention its standards. (6)

Or

- (b) Explain the architecture of SCADA with neat diagram. (16)
14. (a) (i) Explain the components used in DCS. (12)  
(ii) Brief about local control unit used in a process industry. (4)

Or

- (b) (i) In a petroleum industry what are all the process interfacing issues related to DCS. (8)  
(ii) Mention the important communication facilities used in a process industry. (8)
15. (a) (i) List the features present in high level operator interfaces. (6)  
(ii) Explain the operator displays used in any of the process industry. (10)

Or

- (b) (i) Describe with an example low level and high level engineering interfaces. (6)  
(ii) Explain the role of general purpose computers in DCS. (10)