(3 Hours) [Total Marks: 80]

N.B.: (1) Question No. 1 is Compulsory.
      (2) **Attempt any three questions out of the remaining five.**
      (3) **Each question carries 20 marks and sub-question carry equal marks.**
      (4) **Assume suitable data if required.**

1.	(a)	Explain HART Protocol with major features and working in detail.	(5)
	(b)	Explain importance and various Actuators used in Industrial IOT.	(5)
	(c)	Compare Industrial Automation systems PLC and SCADA.	(5)
	(d)	Explain the need of Human machine Interface (HMI) in Automation.	(5)
2.	(a)	Describe major features and working of MODBUS in IIOT applications. Compare MODBUS RTU and MODBUS TCP/IP.	(10)
	(b)	Explain the architecture of Industrial IOT. Discuss various advantages and disadvantages of Industrial IOT.	(10)
3.	(a)	What is role and special requirements of sensors in IIOT? Explain various types of sensors used in Industry.	(10)
	(b)	List the top ten vulnerabilities for attack. Draw and explain IETF six-layer model for IoT/M2M.	(10)
4.	(a)	Explain block diagram and working principle of 4-20mA Analog signal transmission Systems.	(10)
	(b)	Describe the following communication technologies with respect to their standards, data transfer rate, power dissipation etc. i) NFC, ii) Bluetooth, iii)ZigBee, iv)IEEE 802.15.4, v) RFID.	(10)
5	(a)	Explain briefly the function of control valves. Explain principle of Analog valves with current (I) to pressure (P) converter.	(10)
	(b)	What is cyber security defined? Analyze different essential/primary constituents of cyber-Security.	(10)
6.	(a)	Design IOT based smart energy management system for residential/Industrial applications. Specify required Hardware, Software& Application requirements.	(10)
	(b)	How efficient and beneficial are Enterprise Resource Planning (ERP) System & Manufacturing Execution System (MES) in Industries.	(10)

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