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Question Paper Code : 21538

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Seventh Semester

Electronics and Instrumentation Engineering

EI 2401/EI 71/10133 EI 701 — INDUSTRIAL DATA NETWORKS

(Common to Instrumentation and Control Engineering)

(Regulations 2008/2010)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the necessary criteria for an effective and efficient data network?
2. What is meant by redundancy?
3. Define collision detection.
4. What are need for header bits in the configuration of messages?
5. What is the standard used in HART protocol to superimpose digital communication signals and why?
6. Mention the HART universal and common practice commands used in interoperability.
7. How to adapt profibus in hazardous areas?
8. Write the features of MOD bus.
9. What are the problems faced in wired technology?
10. Distinguish between conventional and wireless network in industrial environment.

PART B — (5 × 16 = 80 marks)

11. (a) Explain the different approaches of framing in detail.

Or

(b) Discuss in detail about the layers of OSI model.

12. (a) List and explain the five layers used by internet. Give the general purposes of each layer and its implementation.

Or

(b) Discuss the steps involved in making the communication using TCP/IP with neat diagram.

13. (a) (i) Discuss in detail about the interoperability and interchangeability in field bus environment. (8)

(ii) Write a detailed technical note on the OLE for process control (OPC). (8)

Or

(b) (i) Explain the general field bus architecture with neat diagrams. (8)

(ii) Discuss how the HART field devices can be connected in a multiloop network with reference to an application. (8)

14. (a) (i) Discuss in detail on the protocol stack of profi bus and its transmission technologies with diagrams. (8)

(ii) Explain the hardware configuration with Modbus. (8)

Or

(b) (i) Describe the profibus PA architecture with neat diagrams. (8)

(ii) Discuss the communication model of profi bus. (8)

15. (a) (i) Illustrate in detail about the wireless technologies based on channel rate, transmit power and range. (8)

(ii) Explain the various components of radio link with diagrams. (8)

Or

(b) (i) Discuss in detail about the current ongoing issues of wireless protocol implementation. (8)

(ii) Write a detailed technical note on the radio spectrum and frequency allocation. (8)