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| Question Paper Code | 12617 |
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**B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024**

Sixth Semester

**Instrumentation and Control Engineering**

**20ICPC601 - INDUSTRIAL DATA NETWORKS**

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

**PART - A (10 × 2 = 20 Marks)**

Answer ALL Questions

|   | Marks | K-Level | CO  |
|---|-------|---------|-----|
| 1. Define CSMA /CD protocol.                                | 2     | K1      | CO1 |
| 2. Differentiate between Token Bus and Token Ring.          | 2     | K2      | CO1 |
| 3. List the functions of Gateway.                           | 2     | K1      | CO2 |
| 4. Recall the AS-i Sensor Network Characteristics.          | 2     | K2      | CO2 |
| 5. Define Interchangeability.                               | 2     | K1      | CO3 |
| 6. Give the message format in HART protocol.                | 2     | K1      | CO3 |
| 7. Summarize the benefits of Foundation Fieldbus over HART. | 2     | K1      | CO4 |
| 8. Classify the types of PROFIBUS.                          | 2     | K2      | CO4 |
| 9. Give the types of cables used in communication system.   | 2     | K1      | CO5 |
| 10. Summarize the specifications of 10 Mbps Ethernet.       | 2     | K2      | CO5 |

**PART - B (5 × 13 = 65 Marks)**

Answer ALL Questions

|  |    |    |     |
|--|----|----|-----|
| 11. a) Explain in detail about OSI layer model architecture with neat diagram.                             | 13 | K2 | CO1 |
| <b>OR</b>  |    |    |     |
| b) Describe flow control and error control functions performed by data link layer in detail.               | 13 | K2 | CO1 |
| 12. a) Explain adaptive and non adaptive Routing Algorithms with necessary examples.                       | 13 | K2 | CO2 |
| <b>OR</b>  |    |    |     |
| b) i) Tabulate the difference between the RS 232 and RS 485 standard.                                      | 6  | K2 | CO2 |
| ii) Describe about the communication modes used in RS 232.   | 7  | K2 | CO2 |
| 13. a) Classify the various HART commands and corresponding functionalities and explain any two in detail. | 13 | K2 | CO3 |

**OR**

*K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create*

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- b) Explain the general FIELDBUS architecture. Also briefly explain the functions of Fieldbus. 13 K2 CO3
14. a) Explain the communication model and profile of PROFIBUS. 13 K2 CO4  
**OR**  
 b) With neat sketch explain the structure of MODBUS protocol. 13 K2 CO4
15. a) i) Compare 10 Mbps Ethernet with 100 Mbps Ethernet in detail. 7 K2 CO5  
 ii) Describe the cabling requirement of thin Ethernet. 6 K2 CO5  
**OR**  
 b) i) Briefly explain the components of radio links in detail. 7 K2 CO5  
 ii) Write short notes on 10BASE-T. 6 K2 CO5

**PART - C (1 × 15 = 15 Marks)**

16. a) i) List different types of layers in PROFIBUS used in Process Industries and explain each in detail. 8 K2 CO4  
 ii) Draw the schematic of radio modem configuration and explain in detail. 7 K2 CO5  
**OR**  
 b) i) Compare PROFIBUS and MODBUS Protocol with respect to interoperability and Interchangeability. 7 K2 CO4  
 ii) Describe 100 Mbps Ethernet with its Electrical and Mechanical specifications in brief for a process Application. 8 K2 CO5