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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E. **Semester: VI**

Branch: Electronics & Instrumentation Engineering **Duration: 3 hrs.**

Course Code: 22EI6PCIDN **Max Marks: 100**

Course: Industrial Data Networks

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		MODULE - I	CO	PO	Marks
1	a)	Mention and explain the functions performed by every layer of ISO/OSI in detail with example	CO1	PO1	**08**
	b)	List the main protocols and operation of TCP/IP. With diagram explain OSI model and its relation to Ethernet.	CO1	PO1	**06**
	c)	Define CSMA/CD protocol. With neat sketch explain the concept of CSMA/CD.	CO1	PO1	**06**
		OR			
2	a)	Draw the OSI model and explain the functions performed by each layer of the Model? Explain how data is transmitted in this model.	CO1	PO1	**08**
	b)	Describe HDLC protocol in detail. Explain control field of various frames in HDLC.	CO1	PO1	**06**
	c)	Describe the CSMA/CD MAC technique with necessary diagrams.	CO1	PO1	**06**
		MODULE - II			
3	a)	List the different types of routers. Describe the topology, cabling, and encoding scheme used in Ethernet communication.	CO2	PO1	**10**
	b)	Tabulate the difference between the RS 232 and RS 485 standard.	CO2	PO1	**10**
		OR			
4	a)	Write brief note on standard ETHERNET of 10Mbps and 100Mbps.	CO2	PO1	**10**
	b)	Summarize the salient features of ARC net. Discuss about the ARC net configuration with neat diagram.	CO2	PO1	**10**

			MODULE- III			
	5	a)	Define the message format in HART protocol. How the HART protocol implements layers 1, 2, and 7 of the Open System Interconnection (OSI) reference model.	*CO3*	*PO2*	**10**
		b)	Classify the various HART commands and corresponding functionalities and explain any two in detail.	*CO3*	*PO2*	**10**
			OR			
	6	a)	Explain the various communication modes of HART.	*CO3*	*PO2*	**10**
		b)	For an instrumentation engineer HART protocol is very important, justify this statement. Explain HART protocol implementation in physical and data link layer.	*CO3*	*PO2*	**10**
			MODULE- IV			
	7	a)	With neat sketch explain the general FIELDBUS architecture. How does the OPC relate to field bus standard efforts?	*CO3*	*PO1*	**10**
		b)	Discuss the basic principle of the CAN protocol. Explain with a diagram the OSI 7-layer communication model for the CAN protocol.	*CO3*	*PO1*	**10**
			OR			
	8	a)	Define field bus. Explain about the Field bus technology that supports various topologies.	*CO3*	*PO2*	**10**
		b)	Describe the different field bus standards related to controller, sensors and actuators.	*CO3*	*PO2*	**10**
			MODULE- V			
	9	a)	Describe the MODBUS functions and message format with an application.	*CO3*	*PO2*	**10**
		b)	Classify the types of Profibus. Describe the protocol architecture of Profibus with the help of neat figure.	*CO3*	*PO2*	**10**
			OR			
	10	a)	With neat sketch compare Foundation Field bus model to the OSI seven layers Communication model.	*CO3*	*PO2*	**10**
		b)	With schematic representation explain the ProfiBus protocol stack with physical layer, data link layer and application layer.	*CO3*	*PO2*	**10**

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