Reg. No.																

Question Paper Code	14139

B.E. / B.Tech.. - DEGREE EXAMINATIONS, NOV / DEC 2025

Sixth Semester

Instrumentation and Control Engineering

20ICPC601 – INDUSTRIAL DATA NETWORKS

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	TCP divides a stream of data into smaller units called ……. (a) Frames (b) Packets (c) Segments (d) Data grams	1	K1	CO1
2.	Stations share a medium by adhering to a very simple media access control protocol is called …… (a) CSMA (b) CD (c) CSMA/CA (d) CSMA/CD	1	K1	CO1
3.	The bus topology used for Device Net is ……. (a) Linear (b) Non-linear (c) Ring (d) Token	1	K1	CO2
4.	The network length of DeviceNet is selectable; end-to-end network distance varies with ……. (a) Time (b) Frequency (c) Speed (d) All of the mentioned	1	K1	CO2
5.	2. …… was designed to provide a common bridge for Windows based software applications and process control hardware. (a) Object Learning and Embedding for Process Control (b) Object Linking and Enhancing for Process Control (c) Object Linking and Embedding for Process Control (d) Object Linking and Embedding for Parameter Control	1	K1	CO3
6.	The OPC standard specifies the ……..of real-time plant data between control devices from different manufacturers. (a) functionality (b) communication (c) networking (d) operations	1	K1	CO3
7.	…….systems are usually implemented in new plants or existing plants that must be extended. (a) Modbus (b) Fieldbus (c) Profibus (d) HART	1	K1	CO4
8.	With ProfiBus, all parameters of a device are specified in a so called …….file, which is the electronics data sheet of the device. (a) GSD (b) JPG (c) TIF (d) PNG	1	K1	CO4
9.	Both Wireless HART and ISA-100.11a use a …….. Network. (a) Bus (b) Ring (c) Star (d) Mesh	1	K1	CO5
10.	In Wireless HART, each field device may act as a router of other device's data packets. (a) True (b) False	1	K1	CO5

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	Classify the types of data link protocol.	2	K1	CO1
12.	Mention the advantages and disadvantages of Token Passing.	2	K1	CO1
13.	Differentiate Hub, Switch and Routers.	2	K2	CO2
14.	Enumerate the purpose of bridges as network device.	2	K2	CO2
15.	Classify Field bus standards.	2	K2	CO3
16.	Write the procedure for adaptive routing.	2	K1	CO3
17.	List any two applications of MODBUS and PROFIBUS.	2	K1	CO4
18.	Mention the limitations of MODBUS.	2	K2	CO4

19.	Point out the common standard Ethernet implementations.		*2*	*K1*	*CO5*
20.	Name the different support structures of antenna.		*2*	*K1*	*CO5*
21.	Explain token passing mechanism in PROFIBUS.		*2*	*K2*	*CO4*
22.	Summarize the drawbacks of field bus.		*2*	*K2*	*CO3*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Explain CSMA/CD and CSMA/CA protocols and its operation in detail.	*11*	*K2*	*CO1*
		OR			
	b)	Write short notes on TCP/IP layer protocol. Also compare TCP/IP with OSI.	*11*	*K2*	*CO1*
24.	a)	Explain bridges and gateways in detail.	*11*	*K2*	*CO2*
		OR			
	b)	Discuss about the ARC net configuration with neat diagram.	*11*	*K2*	*CO2*
25.	a)	With neat sketch explain the general field bus architecture.	*11*	*K2*	*CO3*
		OR			
	b)	With neat diagram explain the structure and elements of HART communication systems.	*11*	*K2*	*CO3*
26.	a)	Explain the communication model and profile of PROFIBUS.	*11*	*K2*	*CO4*
		OR			
	b)	Discuss about error checking methods and message forming in MODBUS protocol.	*11*	*K2*	*CO4*
27.	a)	Explain the topology used in the Ethernet.	*11*	*K2*	*CO5*
		OR			
	b)	Illustrate the schematic of a radio modem configuration and interpret its working in detail.	*11*	*K2*	*CO5*
28.	a) (i)	Describe error detection in PROFIBUS.	*6*	*K2*	*CO4*
	(ii)	Compare the features of thin and thick Ethernet.	*5*	*K2*	*CO5*
		OR			
	b) (i)	Briefly explain the features of MODBUS.	*5*	*K2*	*CO4*
	(ii)	Write short notes on 10BASE-T.	*6*	*K2*	*CO5*