

Registration no: _____

Total Number of Pages: 01

M.TECH
EIPE202

Second Semester Examination 2013
COMMUNICATION PROTOCOLS IN INSTRUMENTATION

Time: 3 Hours

Max marks: 70

Answer Question No.1 which is compulsory and any five from the rest.

The figures in the right hand margin indicate marks.

- Q1 Answer the following questions: (2 x 10)
- a) What are the criteria necessary for an effective and efficient data communication system?
 - b) Which layers in the OSI model are the network support layers?
 - c) What are the various data flow directions in a data communication system?
 - d) Draw the block schematic of Fieldbus and write its advantages.
 - e) What are the advantages and disadvantages of an industry open network?
 - f) Explain in brief the basic principle of HART technology.
 - g) Distinguish between a piconet and a scatternet.
 - h) What do you mean by a peer-to-peer process?
 - i) Distinguish between Profibus-PA and Foundation Fieldbus.
 - j) Which type of automation generally requires faster network response times, factory automation or process automation?
- Q2 a) What layers does HART implement in the ISO Reference model? (4)
b) What are Device networks? How do they differ from control networks and Enterprise networks? (6)
- Q3 a) 200 PCs are attached to a 10 Mbps Ethernet with a coaxial cable of 1500 m in three segments of 500 m each. The frames have 800 bits. On the average, how many frames can each PC send every second? (6)
b) Suppose users share a 1 Gbps link. Also suppose each user requires 180 Mbps when transmitting, but each user only transmits 8 percent of the time. When circuit switching is used, how many users can be supported? (4)
- Q4 With the help of a neat sketch of MODBUS Transaction state diagram describes the generic processing of a MODBUS transaction in server side. (10)
- Q5 a) What is a handshaking protocol and why are handshakes useful in protocols? (5)
b) What are the primary differences between RS-232, RS-422, and RS-485 serial interfaces? (5)
- Q6 a) Give the detailed functions of various sub layers of physical layer of a Fast Ethernet. (5)
b) How do the layers of OSI reference model correlate to that of the layers in internet model? (5)
- Q7 a) Discuss and differentiate among LAN, WAN, WPAN and WLAN. (5)
b) Give an account of the functions of each layer of Bluetooth with suitable architectural diagram. (5)
- Q8 Write short notes on *any two* of the followings: (5 x 2)
- a) Wireless HART
 - b) Enterprise inter-network using VLSPs
 - c) Wi-Fi
 - d) ZigBee