Registration no: ☐☐☐☐☐☐☐☐☐☐

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EIPE202

2nd Semester MTech Regular/Back Examination – 2014-15
COMMUNICATION PROTOCOLS IN INSTRUMENTATION
BRANCH(S): EIE
Time: 3 Hours Max marks: 70
Q. code: T290

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 is the difference between a protocol and a fieldbus?
   b) Write down the names of four different types of protocols used in instrumentation?
   c) State different applications of HART protocol in hazardous area.
   d) What is the difference between Ethernet, Profibus and Profinet?
   e) What are the advantages and disadvantages of an industry open network?
   f) What is the difference between network layer delivery and transport layer delivery?
   g) What is the difference between a BSS and an ESS?
   h) Compare the data rates for Traditional Ethernet and Fast Ethernet.
   i) What is Wi-Fi? How it differs from WLAN?
   j) How will you distinguish between Piconet and Scatternet?

Q2   a) What is foundation fieldbus? Explain in brief. (4)
   b) Explain fieldbus performance at the cell or device level. Also explain redundancy and failure considerations which are to be taken in fieldbus used either at device or cell level. (6)

Q3   a) Explain with suitable diagram, HART device variable Vs. dynamic variables. (3)
   b) State application of HART Field device identifying data. (3)
   c) Is calibration essential in HART protocol? If yes, how? If no, why? (4)

Q4   a) What are control networks? How do they differ from Enterprise networks? (5)
   b) Consider the following two possibilities: (5)
      (i) We put 20 hosts on an Ethernet operating at 10 Mbps.
      (ii) We create two separate Ethernets, with 10 hosts operating on each of the Ethernets, and each of the Ethernets operating at 5 Mbps.
      Suggest one potential advantage and one potential disadvantage of approach (i) compared to (ii).

Q5   a) What are various data flow directions? Discuss each one with suitable examples. (5)
   b) Give an account of various sub layers in physical layer of a Fast Ethernet. (5)

Q6   a) Why the OSI reference model has seven layers? Discuss in brief the functions of each layer of OSI reference model. (5)
   b) What do you mean by data communication? Discuss various components of a data communication system. What are the characteristics on which the effectiveness of a data communication system depends on? (5)

Q7   a) What is a Bluetooth? Give the architecture of Bluetooth and discuss its various layers. (5)
   b) Explain Carrier sense multiple access technique in Wireless network. (5)

Q8   Answer *Any Two* of the following: (5 x 2)
   a) Distinguish between Modbus and Modbus Plus
   b) Distinguish between Piconet and Scatternet.
   c) Distinguish between Fast Ethernet and Gigabit Ethernet.
   d) Distinguish between ZigBee and WPAN.