Marus
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ASE-9456: Factory Communication Systems
2017-18 Academic Year
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Tampere University of Technology/Borja Ramis

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Comments:
There are 5 questions. You can score a max of 6 points for each question.
Answer for each question should not be longer than 1 page.
Dictionary and calculator are allowed at the exam

Questions

1. A) <u>Describe and illustrate</u> the two methods for analog to digital conversion learnt during the Factory Communication Systems course.
    B) When each of the methods is more preferable than the other?

2. Consider Shannon capacity formula and Nyquist formula.
    a. Explain when and why we could use both formulas in turn? What we can identify by using first Shannon formula and the Nyquist formula and vice versa when we first apply Nyquist formula and then Shannon formula for capacity?
    b. Consider a situation, where signal bandwidth is 10MHz and signal to noise ratio is 125. What is a communication channel capacity and how many signals levels may be required?

3. A) Explain the bus access participles for CAN protocol
    B) Describe the CAN Protocol Stack
    C) Which mechanisms define the error management capabilities of CAN? <u>List and explain them.</u>

4. Explain the following terms in the context of the Factory Communication Systems course. Use 2-3 sentences per definition.
    a. ISP
    b. UDP
    c. UTP
    d. MICE
    e. GSD
    f. INTERBUS Remote bus

5. A) <u>Cite and describe</u> the functionality of each layer of the OSI model.
    B) Provide a comparison between the layers of the TCP/IP and OSI models.
    C) <u>Cite and explain</u> the four OSI primitive types learnt during the course.