Retake exam CPS track WSAN, 2016-2017.

This exam contains of 4 questions that each have equal weight. All questions can be answered in a few lines, so be clear and concise. You have 60 minutes to complete this exam. No external literature (like books, slides, etc.) is allowed.

Good luck.

1) MAC protocols are an essential element to establish communication in a Wireless Sensor Network.
   a) What are the 4 main reasons for energy waste in MAC protocols for WSNs?
   b) What are the main advantages and disadvantages of a TDMA protocol compared to collision based MAC protocols? Mention at least 4 issues.

2) In WSN ad hoc multi-hop routing protocols are often used to establish a communication between sender and receiver. There also exist single hop networks, such as used in LoRaWAN.
   a) What are the advantages and disadvantages of a multi-hop network communication compared to a star-network? Mention 3 major issues for each.
   b) Several metrics can be used to establish a route in a multi-hop network. Mention 4 different metrics that are commonly used.
   c) A commonly used method to select routes is ETX. Explain how this works. On what parameters does the ETX depend?

3) WSN networks and routing protocols are different from mobile ad hoc networks.
   a) Flooding is a simple strategy for distributing data in a network. Describe and explain the main challenges of flooding.
   b) What are typical communication patterns in a WSN, and what makes that different from mobile ad hoc networks?

4) Opportunistic networks are mainly used in smart phone applications.
   a) Under what names are opportunistic networks also known?
   b) What are the major characteristics of opportunistic networks?
   c) Are routing algorithms designed for mobile ad hoc networks suitable for opportunistic networks? Explain why (not)?

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