

Faculty of Electronic Engineering

Electronics and Electrical
Communications Engineering
Department

Forth Year



Subject: elective course (5)

Data: 16-1-2019

Time allowed, 3 Hours

No. of Pages: 1

QUESTION 1 (4-4-4-4-4)

1. Explain the function and characteristics of the Sink node.
2. Explain the function and drawbacks of the sensor node.
3. Explain the motivations and advantages of WSN.
4. Explain the ideas behind being the sensor has a small size and cost.
5. Explain the unique challenges and Constraints the WSN have.

QUESTION 2 (5-5-5)

1. Draw the block diagram of sensing – actuation sensor node.
 - a- Explain the function of each block.
 - b- Explain the idea behind converting the signal by ADC.
2. Give a complete comparison between WSN and AD-hoc networks
3. Compare between the following communication protocols (802.11 and 802.15.4)

QUESTION 3 (5-5-5)

1. There are many existing security solutions that work against an attacker.
 - a. State 5 of these solutions
 - b. Explain in detail only one of them
2. Explain in detail one type of the following attackers:
 - a. Attacker on physical layer
 - b. Attacker on link layer
 - c. Attacker on routing
3. Distance between sensors can be measured by using many methods, explain:
 - a. Received Signal Strength Indicator (RSSI)
 - b. Time Difference of Arrival (TDoA)
 - c. Compare between them.

QUESTION 4 (5-5-10)

1. Energy Reservoirs is one of the method of providing power for WSN.
 - a. Explain what is meant by Energy Reservoir
 - b. Explain two types of batteries.
2. WSN depends on Embedded Operating System (EOS).
 - a. Explain the characteristics of EOS
 - b. Draw and Compare between event driven and thread driven models Compare between event driven and thread driven EOS
3. WSN has a unique routing protocols, unique medium access control protocols, and can be used in specialist projects. Explain in detail **only one** of the following (a or b or c)
 - a. A Routing protocol in WSN
 - b. A Medium Access Control protocol in WSN
 - c. A Project based on sensor

With My Best Wishes