Roll No. | | | | | | | | | | |

B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2014

Electronics and Communication Engineering

VIII

EC9025 Wireless Sensor Networks

(Regulation 2008)

Time: 3 Hours | Answer ALL Questions | Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Differentiate ad hoc network and WSN.
2. What are the various energy consumption operations in WSN.
3. Define Gateway concept.
4. Mention various performance matrices of WSN.
5. List the various modes of operation of a sensor node.
6. Define routing. Highlight the salient feature of location-based routing?
7. Discuss on any one method for duplicate address detection.
8. What are multi path propagation mechanisms considered in WSN deployments?
9. List the various services offered by localization.
10. Discuss on the pros and cons of augmented general purpose motes.

Part – B (5 x 16 = 80 marks)

11. i)Explain with relevant sketch the functions of different modules of a sensor node. (8)
ii)Calculate the life time of a node and the total number of bits each node can transmit for the three motes given in the table. Assume , 3 joules of energy initially and operating at 800MHz. The duty cycle of the MAC is 80%. (8)

Symbol	Description	Example transceiver		
		μAMPS-1 [559]	WINS [670]	MEDU [67
α_{amp}	Eq. (2.4)	174 mW	N/A	N/.
β_{amp}	Eq. (2.4)	5.0	8.9	7.4
P_{amp}	Amplifier pwr.	179 – 674 mW	N/A	N/.
P_{rxElec}	Reception pwr.	279 mW	368.3 mW	12.48
P_{rxIdle}	Receive idle	N/A	344.2 mW	12.34
P_{start}	Startup pwr.	58.7 mW	N/A	N/.
P_{txElec}	Transmit pwr.	151 mW	$\approx$ 386 mW	11.61
R	Transmission rate	1 Mbps	100 kbps	OOK 3(ASK 11:
T_{start}	Startup time	466 μs	N/A	N/.

12. a) i) Discuss on any 3 applications of WSN (6)

ii) With required diagram explain the single node hardware and software architecture of WSN. (10)

OR

b) i)Is spread spectrum modulation schemes are followed in WSN – justify your answer(8)
ii)Discuss the optimization goals and some of the figure of merits adopted in WSN(8)

13. a) i) Explain any three scheduled based MAC protocols of WSN. (12)

ii) What is duty cycle and how it is calculated in WSN. (4)

OR

b) i)Differentiate proactive and reactive routing. Which routing is more suitable for WSN. Why? (6)

ii)Explain the LEACH routing with the help of neat diagram. Give its advantages and disadvantages? (10)

14. a) Discuss any two energy optimal localization algorithm adopted in WSN (16)

OR

b) i)Design a suitable topology control algorithm that minimizes the maximum power consumed by the nodes.

ii) The position of the three anchor points are (2,1), (5,4) and (8,2) and the

distance of the anchors with respect to the mobile is 3.2, 2 and 3 respectively. Find the position of the mobile

15. a) With required explanation write down the steps for implementing a WSN network and evaluating its performance such as throughput, delay, energy in any node level simulator.

OR

b) i)List out the difference between Zigbee and Bluetooth technologies (8)
(ii)Write short note on TinyOS.

ALL THE BEST