Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2013

Subject code: 725307 **Date: 07-06-2013**

Subject Name: Wireless Sensor Networks

Time: 10.30 am – 01.00 pm **Total Marks: 70**

Instructions:

1. **Attempt to question 1 is compulsory and answer any five questions from the rest.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures mentioned on the right hand side of each questions indicate marks.**

Q. No. 1 **[2 Marks * 10 = 20 Marks]**

a. Explain strong and weak duplicate address detection.

b. Explain shortest path tree

c. Why lifetime of WSN is an important design consideration?

d. Explain steiner tree

e. What is black hole and misdirections in the context of security in wireless sensor networks?

f. Why generally only half-duplex operation is realized in wireless medium?

g. What is Event detection/reporting probability

h. What do you mean by accuracy of localization algorithm?

i. Differentiate between flooding and gossiping

j. Explain the advantages of wireless multicast

Q. No. 2

a. What are the key design challenges of wireless sensor network **[5 Marks]**

b. Explain advantages of simultaneous transmissions over multiple paths **[5 Marks]**

Q. No. 3

a. Discuss why routing protocols for fixed network cannot be used for wireless Sensor network and explain any two flat routing protocols used for sensor Networks. **[10 Marks]**

Q. No. 4

a. What are the main components of sensor node? Show how they are connected with each other. **[4 Marks]**

b. Explain Directed diffusion protocol with suitable example. **[6 Marks]**

Q. No.5

a. Describe data centric addressing showing different types of messages being used during communication **[7 Marks]**

b. What are the main tasks handled by coordinator in IEEE 802.15.4? **[3 Marks]**

Q. No. 6

a. Explain iterative multilateration in multihop environment. **[7 Marks]**

b. Differentiate between id-centric, data-centric and geographic addressing in Wireless Sensor Network **[3 Marks]**

Q. No. 7

a. Explain Light weight Time Synchronization algorithm and derive equation to find offset between two clocks. **[7 Marks]**

b. Explain cross layer optimization in sensor network **[3 Marks]**

Q. No. 8

a. Refer the Figure 1 given below, find the path from T to sink using: **[10 Marks]**

I. Maximum Total Available Battery

II. Minimum Battery Cost Routing (MBCR)

III. Min–Max Battery Cost Routing (MMBCR)

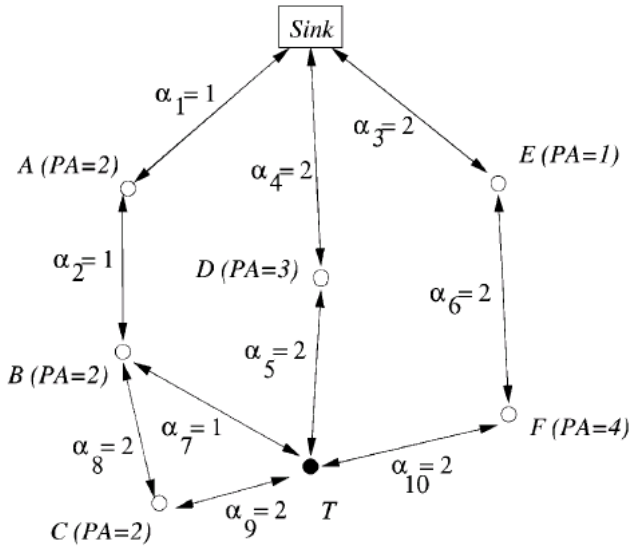

Figure: 1

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