Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II(New course) • EXAMINATION (Remedial) – WINTER- 2015

Subject Code: 3725307 **Date: 15/12/2015**

Subject Name: Wireless Sensor Networks

Time:2:30 pm to 5:00 pm **Total Marks: 70**

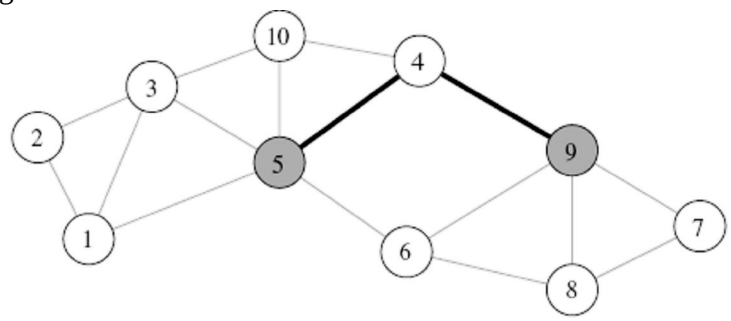
Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	What are the implications of low duty cycle nodes?	**03**
	(b)	How do we use RSSI (Received Signal Strength Indication) to determine the distance?	**04**
	(c)	Discuss why routing protocols for fixed network cannot used for wireless Sensor network and explain any two flat routing protocols used for sensor Networks.	**07**
Q.2	**(a)**	Short notes on Location Based Routing Protocols	**07**
	(b)	Explain SPIN routing protocol with example.	**07**
		OR	
	(b)	In what way TinyOS provides event based programming facility? Take suitable example.	**07**
Q.3	**(a)**	Describe data centric addressing showing different types of messages being used during communication.	**07**
	(b)	Explain Contention Access Period (CAP) and Guaranteed Time Slot (GTS) management in IEEE802.15.4 MAC.	**07**
		OR	
Q.3	**(a)**	Simultaneous transmission over multiple paths provides reliability but it can lead to quick depletion of energy. Suggest some mechanisms to offer tradeoff.	**07**
	(b)	How to avoid overhearing unnecessary traffic in S-MAC?	**03**
	(c)	Differentiate between Steiner tree and shortest path tree	**04**
Q.4	**(a)**	Two nodes A and B do not know their own positions, but they can hear beacons in their proximities. Node A can hear beacons located at (4, 2) and (2, 5). Node B can hear beacons located at (2, 5) and (3, 7). All nodes have a radio range of 2 units. (a) Are either (3, 3.5) or (3, 4.5) possible locations for node A? (b) Are either (2, 6) or (4, 5) possible locations for node B?	**07**
	(b)	With example differentiate between working of Relative Neighborhood Graph and Gabriel Graph strategies used for power control.	**07**
		OR	
Q.4	**(a)**	A geographic greedy forwarding algorithm may lead to voids or deadlocks. Suggest few approaches to take care of this situation.	**07**
	(b)	Explain uniqueness requirements of MAC addresses. Explain any one method for address assignment to nodes.	**07**

Q.5 **(a)** What are the benefits of multi-hop Wireless Sensor Network over Single hop Wireless Sensor Networks? **07**

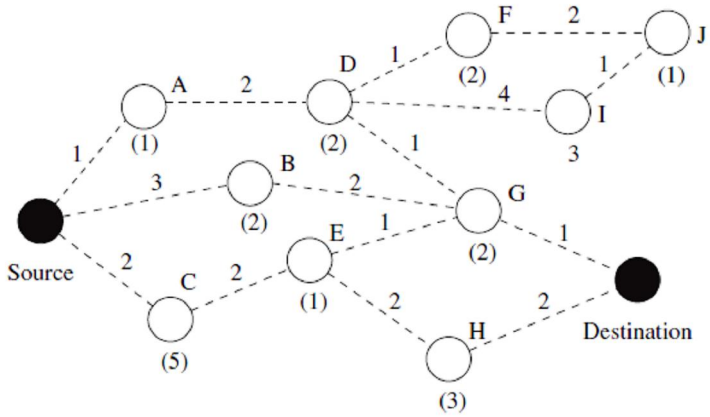
(b) Show how the backbone can be constructed for the given graph. Node 5 and 9 as well as dark edges do not have any significance, consider them as normal nodes/edges. **07**



OR

Q.5 **(a)** Give different energy scavenging techniques used in Wireless Sensor Networks. **07**

(b) For the given sensor network find out the best route from source to destination with following strategies. Maximum Total Available Battery Capacity, Minimum Battery Cost Routing, Minï Max Battery Cost Routing and Minimum number of hops. **07**



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