

GUJARAT TECHNOLOGICAL UNIVERSITY**MCA - SEMESTER-V • EXAMINATION – SUMMER • 2014****Subject Code: 650007****Date: 30-05-2014****Subject Name: Wireless Sensor Network****Time: 10:30 am - 01:00 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 challenges and hurdles that must be overcome for Wireless Sensor Networks? List them and also give countermeasures to overcome them.	07
	(b)	(i) Differentiate between C1WSN and C2WSN. (ii) Explain how Industrial Automation applications provide control, conservation, efficiency and safety? Also list down specific industrial applications.	02 05
Q.2	(a)	Define the following: (i) Reflection (ii) Diffraction (iii) Scattering	07
		(iv) Diffuse Multipath (v) Specular Multipath (vi) Differential Modulation (vii) Null Spot	
	(b)	(i) Which are the resource constraints of sensor nodes? (ii) Explain the intrinsic factors that need to take into account for designing Wireless Networks or Wireless Sensor Networks.	02 05
		OR	
	(b)	List down all the wireless technologies. Explain WLAN and 3GPP in detail.	07
Q.3	(a)	What is CSMA/CA and CSMA/CD? Explain the problem of Hidden Node and Exposed Node problem. Explain collision avoidance using RTS/CTS handshaking.	07
	(b)	Explain LEACH protocol's Networking Model, LEACH Phases, features and its threshold cluster-head selection formula of $T(n)$.	07
		OR	
Q.3	(a)	Explain the SPIN Protocol with SPIN-PP and SPIN-BC using proper figures. Explain its basic operation, advantages and disadvantages.	07
	(b)	Explain general MAC frame format for IEEE 802.15.4 MAC-layer standard. Draw the frames for MAC Header, MAC Payload and MAC Footer.	07
Q.4	(a)	(i) Explain Congestion in Transport Layer Protocol. (ii) Explain GARUDA and PSFQ in detail with its pros and cons.	03 04
	(b)	(i) Explain IrisNet and DSWare with its features and applicability in detail. (ii) Explain DFuse and EM* in detail.	04 03
		OR	
Q.4	(a)	Explain MIDDLEWARE Architecture and principles for Wireless Sensor Networks.	07
	(b)	What are the design considerations for management architecture? Explain it based on the example of MANNA.	07
Q.5	(a)	List all the Operating Systems used with WSNs. (i) Explain Tiny OS (ii) Explain MANTIS. (iii) Explain SenOS.	07
	(b)	Write a note on Classification of routing protocols for wireless sensor networks.	07
		OR	
Q.5	(a)	List all the Operating Systems used with WSNs. (i) Explain EMERALDS. (ii) Explain OSPM (iii) Explain MagnetOS.	07
	(b)	Which are the performance metrics that are used for evaluating the performance of WSN? Explain each of them briefly.	07
