

**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.

<b>Q.1</b>	<b>(a)</b>	What are the challenges and hurdles that must be overcome for Wireless Sensor Networks? List them and also give countermeasures to overcome them.	<b>07</b>
	<b>(b)</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.	<b>02</b> <b>05</b>
<b>Q.2</b>	<b>(a)</b>	Define the following: (i) Reflection (ii) Diffraction (iii) Scattering	(iv) Diffuse Multipath (v) Specular Multipath (vi) Differential Modulation (vii) Null Spot <b>07</b>
	<b>(b)</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.	<b>02</b> <b>05</b>
		<b>OR</b>	
	<b>(b)</b>	List down all the wireless technologies. Explain WLAN and 3GPP in detail.	<b>07</b>
<b>Q.3</b>	<b>(a)</b>	What is CSMA/CA and CSMA/CD? Explain the problem of Hidden Node and Exposed Node problem. Explain collision avoidance using RTS/CTS handshaking.	<b>07</b>
	<b>(b)</b>	Explain LEACH protocol's Networking Model, LEACH Phases, features and its threshold cluster-head selection formula of T(n).	<b>07</b>
		<b>OR</b>	
<b>Q.3</b>	<b>(a)</b>	Explain the SPIN Protocol with SPIN-PP and SPIN-BC using proper figures. Explain its basic operation, advantages and disadvantages.	<b>07</b>
	<b>(b)</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.	<b>07</b>
<b>Q.4</b>	<b>(a)</b>	(i) Explain Congestion in Transport Layer Protocol. (ii) Explain GARUDA and PSFQ in detail with its pros and cons.	<b>03</b> <b>04</b>
	<b>(b)</b>	(i) Explain IrisNet and DSWare with its features and applicability in detail. (ii) Explain DFuse and EM* in detail.	<b>04</b> <b>03</b>
		<b>OR</b>	
<b>Q.4</b>	<b>(a)</b>	Explain MIDDLEWARE Architecture and principles for Wireless Sensor Networks.	<b>07</b>
	<b>(b)</b>	What are the design considerations for management architecture? Explain it based on the example of MANNA.	<b>07</b>
<b>Q.5</b>	<b>(a)</b>	List all the Operating Systems used with WSNs. (i) Explain Tiny OS (ii) Explain MANTIS. (iii) Explain SenOS.	<b>07</b>
	<b>(b)</b>	Write a note on Classification of routing protocols for wireless sensor networks.	<b>07</b>
		<b>OR</b>	
<b>Q.5</b>	<b>(a)</b>	List all the Operating Systems used with WSNs. (i) Explain EMERALDS. (ii) Explain OSPM (iii) Explain MagnetOS.	<b>07</b>
	<b>(b)</b>	Which are the performance metrics that are used for evaluating the performance of WSN? Explain each of them briefly.	<b>07</b>