

**GUJARAT TECHNOLOGICAL UNIVERSITY****MCA - SEMESTER-V • EXAMINATION – SUMMER • 2015****Subject Code: 2650007****Date: 08-05-2015****Subject Name: Wireless Sensor Network (WSN)****Time: 02:30 pm - 05:00 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)** Define the Following: **07**  
(1) Define WSN (2) Single hop vs. Multi hop  
(3) ZigBee (4) Diffraction  
(5) Reflection (6) Microscopic  
(7) Scattering
- (b)** Explain Sensor Network Architectural Elements. List down the Functionality for each of the elements. **07**
- Q.2 (a)** (1) Differentiate between C1WSN and C2WSN **03**  
(2) Write short notes on Background of Wireless Sensor Network Technology. **04**
- (b)** Explain Hardware and Software need of WSN with proper figure and all basic Hardware Subsystem in details. **07**
- OR**
- (b)** List down all the Network Layer Protocol for wireless sensor network. Explain FLOODING and LEACH in details. **07**
- Q.3 (a)** List down all the Medium Access Control Protocol for wireless sensor network. Explain any three in detail. **07**
- (b)** Explain MIDDLEWARE Architecture and principles for Wireless Sensor Networks. **07**
- OR**
- Q.3 (a)** List down all the wireless technologies. Explain WLAN and 3GPP in details. **07**  
**(b)** What are the principles of WSN Middleware? Explain AMF, DSWare, DFuse and CLMF Middle wares in detail. **07**
- Q.4 (a)** What are the design issues with WSN operating systems? List different Operating systems available for WSN. Explain any one of them. **07**
- (b)** Discuss Transport Protocol design issues. List down the examples of Transport Layer Protocols. Also explain problems with Transport Control Protocol. **07**
- OR**
- Q.4 (a)** Explain SPIN protocol in detail. Also explain SPIN-PP and SPIN-BC. **07**
- (b)** List down all the existing Middleware. Explain Impala, MSM, DSS, Em and SensorWare in detail. **07**
- Q.5 (a)** Explain WSN Design Issues for MAC protocols, Routing protocols and Transport protocols in detail. **07**

- (b) List all the Operating Systems used with WSNs. **07**  
(i) Explain Tiny OS (ii) Explain MANTIS.  
(ii) Explain SenOS. (iv) Explain EYES OS

**OR**

- Q.5** (a) Explain Performance Modeling of WSNs by taking proper performance metrics and basic models. **07**  
(b) What are the design issues with network management? Taking example of MANNA, explain network management architecture. **07**

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