

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER-V • EXAMINATION – SUMMER • 2015

Subject Code: 650007

Date: 08-05-2015

Subject Name: Wireless Sensor Network

Time: 02:30 pm to 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 terms **07**
- (i) Sensor Networks
 - (ii) Polling
 - (iii) Throughput
 - (iv) Fairness
 - (v) Shannon's Equation
 - (vi) Inductive Coupling
 - (vii) Formula Threshold, $T(n)$
- (b)** Give examples for the following. **07**
- (i) Military Application
 - (ii) Environmental Application
 - (iii) Health Application
 - (iv) Home Application
 - (v) Commercial Application
 - (vi) Industrial Automation
 - (vii) Nanoscopic Sensor Application
- Q.2 (a)** Give the full form of the following. **07**
- (i) CODA
 - (ii) ESRT
 - (iii) RMST
 - (iv) PSFQ
 - (v) ATP
 - (vi) CLMF
 - (vii) MSM
- (b)** Draw the figure for the following. **07**
- (i) C1WSN
 - (ii) C2WSN
 - (iii) Typical Sensing Node
 - (iv) All IP 3G Cellular Service
 - (v) Super frame structure
 - (vi) Data and Acknowledge Frame format
 - (vii) Multihop data and Query Forwarding

OR

- (b) Give the full form of the following. 07
(i) DDS
(ii) ISM
(iii) DARPA
(iv) MANET
(v) FHSS
(vi) WSN
(vii) MIMO
- Q.3** (a) Explain hardware and software need of WSN with proper figures. Explain basic software subsystems. Also explain Smart Dust and COTS motes sub systems. 07
(b) Define Reflection, Diffraction and Scattering. What are the radio propagation modes and what are the propagation impairments. 07
- OR**
- Q.3** (a) Write a note on modulation. Draw the graph comparing efficiency of each modulation schemes. Write the equation of Shannon. 07
(b) Compare 802.11, 802.15.1/Bluetooth and 802.15.4/Zigbee in a tabular format. 07
- Q.4** (a) Write at least ten points giving the difference between Wi-Fi and Mobile WiMax Technology. Follow three column table structure to write the difference. 07
(b) Write a note on CSMA. Also explain in detail what is CSMA/CD and CSMA/CA. What is the problem of Hidden Station and Exposed Station problem? What is the solution to these problems? 07
- OR**
- Q.4** (a) Explain Slotted CSMA algorithm and Un-slotted CSMA algorithm by drawing proper data flow diagrams. 07
(b) Explain SPIN protocol in detail. Also explain SPIN-PP and SPIN-BC. 07
- Q.5** (a) Explain CODA and ESRT. 07
(b) List down all the existing Middleware. Explain MiLAN, AMF, Em* and CLMF in detail 07
- OR**
- Q.5** (a) List down all the operating systems available for WSN. Explain MANTIS, EYES OS, EMERALDS in detail. 07
(b) What are the design issues with network management? Taking example of MANNA, explain network management architecture. 07
