Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER–V • EXAMINATION – SUMMER 2017

Subject Code: 2650007 **Date:06/06/2017**

Subject Name: Wireless Sensor Network (WSN)

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: **07**

1. Define WSN
2. Nanoscopic and Microscopic
3. Diffraction and Scattering
4. Chipless RFID tag
5. Inductive Coupling
6. EAS
7. Formula Threshold, T(n)

(b) (i) Differentiate between WSN and MANETs. **07**
(ii) List the applications of WSN in different fields. Explain any two in detail.

Q.2 **(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) (i) Explain in detail Modulation in Wireless Sensor Networks. **07**
(ii) Give comparative overview of Wi-Fi and Mobile WiMax.

OR

(b) Explain the intrinsic factors that need to take into account for designing Wireless Networks or Wireless Sensor Networks. **07**

Q.3 **(a)** Give IEEE 802.15.4 and ZigBee reference model. Also explain its importance in WSN. Give brief about ZigBee stack reference model. **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 fields of general MAC frame, Beacon frame, Data and ACK frame, MAC command frame and Superframe structure as energy saver with proper figures. **07**

(b) Explain SPIN protocol in detail. Also explain SPIN-PP and SPIN-BC. **07**

Q.4 **(a)** List down all the existing Middleware. Explain MiLAN and IrisNet in detail. **07**

(b) Explain forwarding approaches with respect to geographical routing. Explain localized and globalized forwarding decision. How geographical routing forwarding strategies are set. Explain Greedy algorithm forwarding progress failure. Also give the solution? **07**

OR

Q.4	**(a)**	List all the Operating Systems used with WSNs. **(i)** Explain Tiny OS **(ii)** Explain MANTIS. **(iii)** Explain SenOS.	**07**
	(b)	Explain RMST and PSFQ.	**07**
Q.5	**(a)**	Explain Performance Modeling of WSNs by taking proper performance metrics and basic models.	**07**
	(b)	Write a note on Classification of routing protocols for wireless sensor networks.	**07**

OR

Q.5	**(a)**	Explain Congestion in Transport Layer Protocol.	**07**
	(b)	Explain CODA with reference to Congestion Detection and Avoidance by Transport Control Protocol.	**07**

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