

Total No. of Questions : 9]

SEAT No. :

P2409

[4758]-577

[Total No. of Pages : 2

T.E. (Computer Engineering)

**DATA COMMUNICATION AND WIRELESS SENSOR NETWORKS
(2012 Course) (Semester-I) (310243) (End Semester)**

Time : 2 1/2 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Questions 1, 2, 3, 4 (10 marks each). Solve either question 1 or question 2 and question 3 or question 4.*
- 2) *Question 5, 6, 7, 8 (16 marks each). Solve either question 5 or question 6 and question 7 or question 8.*
- 3) *Question 9 (18 marks).*
- 4) *Neat diagrams must be drawn wherever necessary.*
- 5) *Assume suitable data if necessary.*
- 6) *Figures to the right indicate full marks.*

- Q1)** a) Explain Bluetooth frame format. **[5]**
b) Explain various data link layer framing techniques, Apply bit stuffing on the given data string 0100111110111111011111111011. **[5]**

OR

- Q2)** a) Why CSMA/CD is not used in Wireless Networks? How the problems are solved using CSMA/CA? **[4]**
b) Draw following line codes for 1010 0000 0000 1011 0000 1011 0000 AMI, Pseudoternary, Manchester. **[6]**

- Q3)** a) A pure ALOHA network transmits 200-bit frame on a shared channel of 200 kbps. What is the throughput if the system (all stations together) produces **[6]**
i) 1000 frames per second
ii) 500 frames per second
b) Explain Category-I type of sensor networks, list few applications of it. **[4]**

OR

- Q4)** a) Explain typical sensing nodes architecture, how this sensing node is different from the nodes in other networks? **[5]**
b) Explain various multiplexing techniques with their advantages and disadvantages. Justify now a days there is a need of TD-SCDMA and LTE-TDD technologies. **[5]**

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- Q5)** a) Explain with block diagram conceptual view of FEC techniques, also explain interleaving phase with one example. [8]
b) Explain S-MAC protocol for WSN in detail. [8]

OR

- Q6)** a) Why Naming and addressing is challenging in WSN, explain Content-based and geographic addressing with example. [8]
b) LEACH is a self organizing, adaptive clustering protocol and it distributes energy consumption at every node in the sensor network uniformly- justify. Also explain with diagram the organization of LEACH rounds. [8]

- Q7)** a) Explain flat based, hierarchical based and location based routing protocols used in WSN with at least one example each. [8]
b) How proactive and reactive routing protocols for ad hoc networks works? Also compare these protocols based on the way route is established, memory usage, network overhead, delay in establishing route, effect of node movement from route or link failure. [8]

OR

- Q8)** a) Explain Routing Challenges and Design Issues in WSNs, also discuss about data delivery models. [8]
b) What is the motivation behind designing SPIN routing protocol for WSN? Also discuss its various Deficiencies. [8]

Q9) Write short notes on (Any Three): [18]

- a) The role of every sensor node in information driven sensor querying (IDSQ) method.
b) Trilateration method used to estimate the position of a sensor node.
c) Introduction to Internet of Things(IoT).
d) Comparison of TinyOS with other OS like MATE, MAGNET and MANTIS.

