



P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belagavi)
Seventh Semester, B.E. - Electronics and Communication Engineering
Semester End Examination; Jan. / Feb. - 2021
Wireless Sensor Networks and Technology

Time: 3 hrs

Max. Marks: 100

Note: Answer FIVE full questions, selecting ONE full question from each unit.

UNIT - I

- 1 a. Describe the characteristic requirements in WSN. 10
- b. Explain the following terms of WSN;
- i) Sensor
 - ii) Network topology 10
 - iii) Geographic rating
 - iv) Task
 - v) Node service
- 2 a. Explain the operation of a smart transportation system as an application of WSN. 10
- b. Define the following in terms of WSN;
- i) Data centric 10
 - ii) Information utility
 - iii) Localization and Tracking

UNIT - II

- 3 a. With the help of a neat block diagram, explain the overview of main sensor node hardware components. 10
- b. Explain the operation of the RF front end architecture of the transceiver of a node and its four operational states, with the help of a neat diagram. 5
- c. Write a note on active and passive sensors. 5
- 4 a. Differentiate between single-hop and multi-hop communication technologies and comment over the efficiency of each technique. 7
- b. Define mobility. Describe three forms of mobility used in WSN. 6
- c. Discuss how communication is established from WSN to internet? 7

UNIT - III

- 5 a. Explain the following physical layer and transceiver design consideration in WSN;
- i) Energy usage profile 8
 - ii) Choice of modulation scheme
- b. Discuss the operation of S-MAC protocol with the assistance of S-MAC principle, fragmentation and NAV setting. 12

- 6 a. Explain the Address and Name management scheme used in WSN. 10
- b. Explain the different strategies available for multipath unicast routing. 10

UNIT - IV

- 7 a. List out the criteria on which the Time synchronization protocols are classified. 6
- b. Explain the process of cluster and cluster head formation. How sensor nodes communicate? Explain. 6
- c. Explain Reference Broadcast Synchronization (RBS). 8
- 8 a. What do you mean by localization? Explain various ranging techniques. 10
- b. Explain the following in WSN;
- i) Information based sensor tasking 10
 - ii) Joint routing
 - iii) Information aggregation

UNIT - V

- 9 a. With a neat block diagram, explain MICA mote architecture. 10
- b. Explain the different functions calls between Tiny OS components of field monitor application. 5
- c. Write a short note on tiny GALs. 5
- 10 a. Explain the silent features of the following;
- i) Node-level-software platform – nesc 10
 - ii) Node-level simulator – NS2
- b. Explain the working principle of Programming and Interaction Environment for Collaborative Embedded Systems (PIECES). 10

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