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Question Paper Code: BES210



# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

M.Tech II Semester End Examinations (Regular) - July, 2017

Regulation: IARE-R16

## EMBEDDED WIRELESS SENSOR NETWORKS (Embedded Systems)

Time: 3 Hours

Max Marks: 70

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Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

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### UNIT – I

- (a) List and briefly discuss the characteristics that are shared among most of the WSN applications. [7M]  
(b) Briefly discuss the energy consumption behavior of radio transceivers during transmission and reception. [7M]
- (a) Briefly describe different Programming paradigms and application programming interfaces in WSN. [7M]  
(b) Explain different hardware components in sensor node. [7M]

### UNIT – II

- (a) Illustrates the idea of aggregation by taking an example. [7M]  
(b) Explain how a wireless sensor network can be enabled to access the remote clients via the Internet. [7M]
- (a) Briefly discuss different options for interfacing an application to a protocol stack in WSNs. [7M]  
(b) Explain different energy efficiency parameters considered in most of the WSN applications. [7M]

### UNIT – III

- (a) What is an atomic block in NesC and write a atomic statement to illustrate multiple invocation of the async command share the values of the variable x. [7M]  
(b) What is Beaconing in wireless sensor networks and write the pseudocode describing how beaconing works. [7M]
- (a) Write a nesC program to Print MessageC illustrating how to implement send Done as a task. [7M]  
(b) Explain different layers in Sensor network stack architecture. [7M]

#### UNIT – IV

7. (a) Explain different components in the architecture of TinyCubus. [7M]  
(b) Briefly discuss core and loaded programs in Contiki architecture. [7M]
8. (a) What is SensorWare? Explain different types of task classes in runtime environment of SensorWare. [7M]  
(b) Briefly discuss different algorithms supported in Magent OS for application component movements. [7M]

#### UNIT – V

9. (a) Briefly discuss pros and cons of different algorithms for navigation of autonomous robots in WSNs. [7M]  
(b) What is localization in adhoc and wireless sensor networks and explain different types of localization techniques? [7M]
10. (a) What is coordinated approach during path planning in multi-robot system? [7M]  
(b) Write a brief note on different medium access protocols of wireless sensor networks. [7M]

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