Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **14EC3048** | **Duration :** | **3hrs** |
| **Sub. Name :** | **EMBEDDED SENSOR NETWORKS** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Compare the features of sensor networks with traditional networks. | CO1 | 8 |
| b. | Outline the functional architecture of wireless sensor networks and explain its layered structure in detail. | CO1 | 12 |
| **(OR)** | | | | |
| 2. | a. | Appraise the design challenges of wireless sensor networks. | CO1 | 8 |
| b. | Elaborate the construction of sensor node and interpret the functions of individual components. | CO1 | 12 |
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| 3. | a. | Examine the need of time synchronization in wireless sensor networks. Explain in detail about  i) Network Time protocol (NTP)  ii) Reference Broadcast Synchronization (RBS) | CO2 | 16 |
| b. | Discuss any one application of wireless sensor networks in detail. | CO1 | 04 |
| **(OR)** | | | | |
| 4. | a. | Why traditional transport control protocols are not suitable for wireless sensor networks? Discuss the importance of any two transport layer protocol. | CO2 | 14 |
| b. | Elaborate the features of SMAC protocol. | CO2 | 6 |
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| 5. | a. | Estimate the position of an object using the principle of  i) Trilateration method. ii) Multilateration method. | CO3 | 10 |
| b. | Analyze the importance of pattern matching in wireless sensor networks with a help of Nearest Neighbor in Signal Space (NNSS) algorithm. | CO3 | 10 |
| **(OR)** | | | | |
| 6. | a. | Justify the statement “GPS is not suitable for wireless sensor networks”. Explain the methods to estimate the distance of an  unknown object using  i) TDoA ii) ToA iii) AoA iv) Signal strength. | CO3 | 12 |
| b. | Inspect the principle of network based tracking. | CO3 | 08 |
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| 7. | a. | Discuss about security challenges in wireless sensor networks. | CO3 | 10 |
| b. | Write the features and functions of Bluetooth. | CO3 | 10 |
| **(OR)** | | | | |
| 8. | a. | Interpret the principle of active power management in wireless sensor networks. | CO3 | 10 |
| b. | Examine the design issues in energy efficient MAC protocol and discuss about IEEE802.11 protocol. | CO3 | 10 |
|  | | **Compulsory**: |  |  |
|  | a. | Summarize the different types of data aggregation methods in wireless sensor networks. | CO3 | 10 |
| b. | Discuss in detail about design challenges in sensor networks database. | CO3 | 10 |