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Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET UNIVERSITY)

Ph.D. (Second Semester-Summer) Examinations, April – 2026

23SPPEEC2014 – Wireless Sensor Networks

(ECE)



Time: 3 hrs

Maximum: 70 Marks

The figures in the right hand margin indicate marks.

Answer ANY FIVE Questions.

(14 x 5 = 70 Marks) Marks

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| 1.a. | Discuss the architecture of a typical sensor network, including its various components and their functions. | 8 |
| b. | Compare and contrast sensor networks with Ad Hoc Networks in terms of their design, communication protocols, and applications. | 6 |
| 2. | Discuss the various types of sensors, microcontrollers, and communication modules commonly used in sensor nodes, along with their characteristics and selection criteria. | 14 |
| 3.a. | Describe the different layers of software typically found in sensor nodes, such as operating systems, middleware, and application software. | 7 |
| b. | Explain how advancements in technology have led to the development of platforms like micaZ, tmote, and btnode. | 7 |
| 4. | Compare and contrast the hardware features of the following sensor node platforms: mica2, telosB, Imote2, and Sun SPOT. | 14 |
| 5.a. | Discuss the role of operating systems in sensor networks, focusing on tinyOS, Contiki, and RetOS. | 7 |
| b. | Compare and contrast the programming paradigms of C and nesC in the context of wireless sensor network development. | 7 |
| 6.a. | Discuss the importance of performance evaluation in wireless sensor networks. | 7 |
| b. | Explore the capabilities and limitations of open-source simulation platforms like ns-2 in comparison to commercial platforms such as QualNet and Opnet. | 7 |
| 7. | Explore the fundamentals of the 802.15.4 standard and its significance in wireless sensor networks. | 14 |
| 8.a. | Explain how UWB differs from traditional wireless communication technologies like Bluetooth and Wi-Fi. | 7 |
| b. | Compare and contrast multi-hop and cluster-based routing protocols in wireless sensor networks. | 7 |

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