



(Knowledge for Development)

KIBABII UNIVERSITY

**UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR**

**END OF SEMESTER EXAMINATIONS
YEAR FOUR SEMESTER ONE EXAMINATIONS**

**FOR THE DEGREE OF
BACHELOR OF COMPUTER SCIENCE**

COURSE CODE : CSC 472E

**COURSE TITLE : WIRELESS SENSOR
NETWORKS**

DATE: 21/06/2021 TIME: 09:00 A.M – 11:00 A.M.

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO

QUESTION ONE [COMPULSORY] [30 MARKS]

- a) What is sensor node? How is it different from a gateway? [4 marks]
- b) Discuss the characteristic requirements of Wireless Sensor Networks (WSN). [5 marks]
- c) MANET and WSN were considered emerging technologies a decade ago. As a network architect, compare these two technologies. [6 marks]
- d) State the fundamental tasks of Address Management in WSN. [4 marks]
- e) Differentiate between active and passive sensors as used in WSN. [6 marks]
- f) Describe any Five (5) applications of Wireless Sensor Networks. [5 marks]

QUESTION TWO [20 MARKS]

- a) Identify the Three (3) types of mobility. [3 marks]
- b) Identify and explain the design principles for WSN. [6 marks]
- c) Discuss issues and challenges experienced in the design of a Wireless Sensor Network. [6 marks]
- d) Explain how clustering solves the issue of scalability on WSN. [5 marks]

QUESTION THREE [20 MARKS]

- a) What is event detection? [3 marks]
- b) Differentiate between the following terms
 - i. Controller and memory [2 marks]
 - ii. Sensors and Actuators [2 marks]
 - iii. Single hop and multihop [3 marks]
- c) What is localization and what is the advantage of localization? [6 marks]
- d) Explain any two (2) time synchronization algorithms of WSN. [4 marks]

QUESTION FOUR [20 MARKS]

- a) Discuss directional antenna for Ad hoc networks. [5 marks]
- b) Discuss the following traditional network management models
 - i. Simple Network Management Protocol [8 marks]
 - ii. Telecom Operation Map [7 marks]

QUESTION FIVE [20 Marks]

- a) What are the advantages and disadvantages of MAC protocols using directional antennas? **[4 marks]**
- b) Explain Wireless Sensor Network Taxonomy and Trends. **[4 marks]**
- c) Explain why TCP doesn't work well in Wireless Sensor Networks. **[8 marks]**
- d) Which are the Performance Metrics that are used for evaluating the Performance of WSN? **[4 marks]**
Explain each of them briefly.