



(Knowledge for Development)

KIBABII UNIVERSITY

(KIBU)

**UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR**

**SPECIAL / SUPPLEMENTARY EXAMINATIONS
YEAR FOUR SEMESTER ONE EXAMINATIONS**

**FOR THE DEGREE OF
COMPUTER SCIENCE**

COURSE CODE : CSC 472E

COURSE TITLE : WIRELESS SENSOR NETWORKS

DATE: 14/11/22 TIME: 08.00 A.M 10.00 A.M

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

QUESTION ONE [30 MARKS-COMPULSORY]

- a. There exists different types of computer networks which are designed to operate over the area they cover, service type, network coverage area, etc. Define PAN [2marks]
- b. Explain data aggregation as used in WSN's. [2mark]
- c. The global middleware market size is projected to reach \$8,400 million in 2025 and for good reasons. While designing architecture from scratch, or even during a rehaul, it makes sense to design for middleware requirements as well. State and explain Five key entities of each generic middleware component that is deployed across any system:
- d. Briefly give the characteristics of Analog and digital sensors [5marks]
- e. Differentiate between Sensor management protocol and Sensor query and data dissemination protocol. [4marks]
- f. Compare and contrast ad-hoc networks and wireless sensor networks. [6marks]
- g. Differentiate between Structured and Randomized Deployment of WSN's [4marks]

QUESTION TWO [20 MARKS]

- a. Using an illustration, discuss the Wireless Sensor Network Architecture [10marks]
- b. State any three characteristics of WSN's [3marks]
- c. Describe the Zigbee network as used in WSN's [7marks]

QUESTION THREE [20 MARKS]

- a. Describe five challenges of sensor networks. [5marks]
- b. Wireless sensor networks have been useful in a variety of areas. Describe the primary areas in which these networks are deployed [5 marks]
- c. State and explain Five Factors influencing WSN design. [10marks]

QUESTION FOUR [20 MARKS]

- a. As a WSN expert, discuss which of the two main wireless standards is better for use in WSN i.e. 802.15.4 and Zigbee. [10marks]
- b. Describe any three areas that WSN could be majorly applied in future. [6marks]
- c. State and explain any four application areas of wireless sensor Networks. [4marks]

QUESTION FIVE [20 MARKS]

- a. Discuss medium access control protocols for wireless sensor networks. [10marks]
- b. Sensor nodes have several components inbuilt within them. Explain the following [5marks]
 - i. components
 - ii. Sensing Unit
 - iii. Processing Unit
 - iv. Transceiver Unit
 - v. Power Unit
- c. The routing protocols define how nodes will communicate with each other and how the information will be disseminated through the network. Discuss the two types of Classifications of routing protocols. [5 Marks]