



(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS 2019/2020 ACADEMIC YEAR

SPECIAL / SUPPLEMENTARY EXAMINATIONS YEAR FOUR SEMESTER TWO EXAMINATIONS

FOR THE DEGREE OF BACHELOR OF COMPUTER SCIENCE

COURSE CODE : CSC 454E

**COURSE TITLE: WIRELESS SYSTEMS &
PROTOCOLS**

DATE: 17/02/2021 TIME: 08.00 A.M – 10.00 A.M

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

QUESTION ONE (COMPULSORY) [30 MARKS]

- a) What is 802.11n? [2 marks]
- b) Why do I need 802.11n products? [6 marks]
- c) What levels of performance can be expected from 802.11n? [3 marks]
- d) What makes routing algorithm a challenging task in the ad hoc network when there are lots of algorithms available for the wired network? [4 marks]
- e) State any five (5) desirable properties of MANET routing protocol. [5 marks]
- f) Discuss each of the following ad-hoc network routing protocols
 - i. Table Driven Protocols [2 marks]
 - ii. On Demand Protocols [2 marks]
 - iii. Hybrid Protocols [2 marks]
- g) Differentiate between Fisheye State Routing (FSR) and Global State Routing (GSR) protocol [4 marks]

QUESTION TWO [20 MARKS]

- a) What are some of the disadvantages of wireless networks compared to wired networks? [5 marks]
- b) Wireless technologies could revolutionize greater data rates, however they don't live to these expectations most of the time. Outline any three reasons that hinder wireless systems from optimizing data rates to the end user. [6 marks]
- c) Differentiate between hard handoff and soft handoff. [4 marks]
- d) Discuss the following major systems as evolved in the second generation:
 - i. GSM [3 marks]
 - ii. IS-95 [2 marks]

QUESTION THREE [20 MARKS]

- a) What is an ad hoc network? [2 marks]
- b) Discuss the main features of ad hoc networks [8 marks]
- c) Explain the three types of ad hoc networks. [6 marks]
- d) Outline any typical applications of ad hoc networks [4 marks]

QUESTION FOUR [20 MARKS]

- a) Explain the following network entities of the shared elements of the 3G UMTS core network architecture.
- i. Home location register (HLR) [2 marks]
 - ii. Equipment identity register (EIR) [2 marks]
 - iii. Authentication centre (AuC) [2 marks]
- b) Differentiate between 4G and 3G networks. [6 marks]
- c) State the eight criteria proposed by Groupe Speciale Mobile Association (GSMA) that a connection should meet to qualify for a 5G [4 marks]
- d) Discuss the advantages and disadvantages of 5G [4 marks]

QUESTION FIVE [20 Marks]

- a) The highest internet download speed possible with Cable and DSL is 3 Mbps. Why do I need more than the 54 Mbps my 802.11g router provides to handle such traffic? [6 marks]
- b) Which applications require throughput levels not easily supported by legacy Wi-Fi networks? [8 marks]
- c) Can I use 802.11n products with my old Wi-Fi gear? [3 marks]
- d) If I have a mixed network of 802.11n and previous generation Wi-Fi gear (802.11 a/b/g), can I still get the benefits of 802.11n? [3 marks]