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(Knowledge for Development)

**KIBABII UNIVERSITY
(KIBU)**

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
END OF SEMESTER EXAMINATION**

2021/2022 ACADEMIC YEAR

THIRD YEAR FIRST SEMESTER EXAMINATION

**FOR THE DEGREE OF BACHELORS OF SCIENCE IN
(INFORMATION TECHNOLOGY)**

COURSE CODE: BIT 311

COURSE TITLE: WIRELESS AND MOBILE COMPUTING

DATE: 24/05/2022

TIME: 2.00 P.M. – 4.00 P.M.

2HRS

INSTRUCTIONS TO CANDIDATES:

ANSWER QUESTION ONE AND ANY OTHER TWO.

Paper Consists of 3 Printed Pages. Please Turn Over ►

QUESTION ONE (COMPULSORY) [30 MARKS]

- a) Explain the concept of Localization as applied to GSM [2Marks]
- b) Using GZ, discuss the three types of satellite [3Marks]
- c) What is the difference between UMTS and WiMax? State the area coverage, and the throughput [4Marks]
- d) Discuss the two Transmission technique in wireless networks [4Marks]
- e) Explain why the effective through put of a wireless network differs from the theoretical throughput [2Marks]
- f) A customer capturing the signals of two access points should select the access point to which it will connect. In your opinion, how is selection done If an 802.11b access point is located in the same place an access point 802.11a and what is impact on the throughput? Explain your answer [6Marks]
- g) A GSM subscriber has a communication 20 minutes. What is the number of slots that is sent by the base station during communication? [3Marks]
- h) What is the maximum bit rate between a mobile phone (MS) and a base station (BTS)? Explain your answer [3Marks]
- i) State three advantages of the using of OFDM and MIMO at the radio layer of LTE [3Marks]

QUESTION TWO [20 MARKS]

- a) Handover is an important concept in GSM network.
 - i) State two reason to why Handover is important [2Marks]
 - ii) Explain the four possible handover scenarios in a GSM network with a help of a diagram [8Marks]
- b) In MS Protocols, the GSM signaling protocol is assembled into three general layers. State the functions of this layers [8Marks]
- c) How is wireless sensor networks different from normal wireless network? [2Marks]

QUESTION THREE [20 MARKS]

- a) International Mobile Station Equipment Identity (IMEI) is made up of four parts. Discuss this parts starting the total number of items they hold [8Marks]
- b) Outline the functioning of WIFI network working at speed of 11Mbit/s [6Marks]
- c) Define and compare TDMA techniques, FDMA , CDMA [6Marks]

QUESTION FOUR [20 MARKS]

- a) With the help of a diagram discuss the four basic components of a wireless network [8Marks]
- b) You would like to install an 802.11g access point which 13 channels are available. You detect the presence of another access point which uses channel 4. What would be the effect on the performance of your WLAN
 - a. If you choose channel 4 explain [2Marks]
 - b. If you select channel 5 explain [2Marks]
 - c. If you select channel 13 explain [2Marks]
- c) Using a diagram, briefly explain what GPRS is and how it works [6marks]

QUESTION FIVE [20 MARKS]

- a) To avoid handle collision CSMA/CA protocol provides four mechanism. Discuss [8Marks]
- b) Discuss any four security threats to wireless networks and their solutions [8Marks]
- c) Intents can be used to send information over net. Using an example of your choice write and explain a code that will do that [4Marks]