



SCHOOL OF COMPUTING AND ENGINEERING SCIENCES
BACHELOR OF SCIENCE IN COMPUTER NETWORKS AND SECURITY
CNS 3204: Wireless and Mobile Security
END OF SEMESTER EXAM

Date: 19th December 2023

Time: 15:30-17:30 Hours

Instructions:

This Examination consists of **FIVE** questions

Answer **Question ONE (COMPULSORY)** and any other **TWO** questions.

Question One [30 Marks]

- a. Explain two infrastructure risks that Safaricom would be concerned about in terms of network security. (4 marks)
- b. Explain why wireless networks are more vulnerable compared to wired networks (2 marks)
- c. Explain the following wireless network attacks: (6 marks)
 - i. Rogue access point
 - ii. Denial of service attack in a WiFi network
 - iii. SIM card cloning
- d. Explain two security modes in Bluetooth (4 marks)
- e. State three differences between (you can use a table): (6 marks)
 - i. WEP and WPA.
 - ii. WPA and WPA2
- f. Explain how access control authentication happens in a 2G network. (4 marks)
- g. Explain two possible solutions against attacks to a smart home. (4 marks)

Question Two [15 Marks]

- a) Explain briefly the following security measures in Wimax network: (6 marks)

- i. RSA type authentication
 - ii. EAP type authentication
 - iii. Authorization
- b) Explain two possible attacks against a Bluetooth network (4 marks)
 - c) Explain the difference between unit key and combination key in Bluetooth. (2 marks)
 - d) Use the Figure Q2(c) to explain how a link key is generated in Bluetooth. (3 marks)

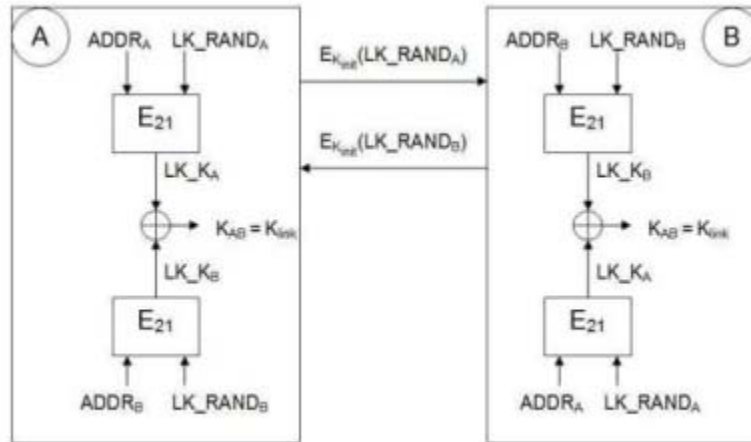


Figure 2(c)

Question Three [15 Marks]

- a. State three differences between WPA3 and WPA2. (3 marks)
- b. Explain two layer two denial of service attacks in WiFi. (4 marks)
- c. Explain the following in IEEE 802.11x architecture:
 - i. Authentication by port (1 mark)
 - ii. RADIUS server (2 mark)
 - iii. Supplicant (1 mark)
- d. Explain the following protocols as applied to IEEE 802.11i. (4 marks)
 - i. TKIP
 - ii. CCMP

Question Four [15 Marks]

- a) Explain why a 3G UMTS network is more secure compared to a 2G network. (4 marks)

- b) Explain two differences between LTE and 3G UMTS security implementation. (4 marks)
- c) Explain the following is achieved in a GSM/GPRS network: (4 marks)
 - a. Subscriber identity protection.
 - b. Encryption of radio communication
- d) Explain why a 5G network is more vulnerable compared to a 2G network. (3 marks)

Question Five [15 Marks]

- a) Explain three solutions to security issues unique to a Mobile Ad Hoc Network and their solutions (6 marks)
- b) Explain any three security challenges in IoT. (6 marks)
- c) Explain two GPRS security flaws. (3 marks)