Strathmore UNIVERSITY

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: 9th December 2024 **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 **4G network security vulnerabilities.** (4 marks)

b. Explain the following wireless network attacks: (6 marks)

   i. Layer 2 denial of service attack in a WiFi network

   ii. Denial of sleep attack

c. Explain three attacks against the Bluetooth protocol stack (6 marks)

d. State two differences between (you can use a table): (4 marks)

   i. WEP and WPA.

   ii. WPA and WPA2

e. Explain how mutual authentication happens in a 3G network. (4 marks)

f. Explain three possible threats to a smart grid. (6 marks)

Question Two [15 Marks]

a) Explain three threats to a WiMax network. (6 marks)

b) Explain three security modes in Bluetooth (6 marks)

c) Use the Figure Q2(c) to explain how a link key is generated in Bluetooth. (3 marks)

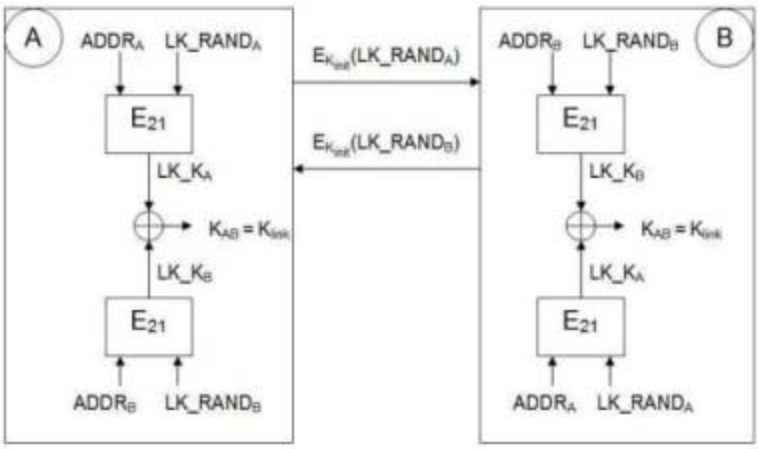

Figure 2(c)

Question Three [15 Marks]

a. State three differences between WPA3 and WPA2. (3 marks)

b. Explain how authentication happens in WEP (4 marks)

c. Explain how a replay attack is possible in IEEE 802.11 (3 marks)

d. Explain the following in IEEE 802.11x architecture:

   i. Authentication by port (2 mark)

   ii. RADIUS server (2 mark)

   iii. Supplicant (1 mark)

Question Four [15 Marks]

a) Explain two differences between LTE and 3G UMTS security implementation. (4 marks)

b) Explain three security issues in 5G software defined network (6 marks)

c) Explain the following is achieved in a GSM/GPRS network:

   a. Subscriber identity protection (2 marks).

   b. Authentication (3 marks)

Question Five [15 Marks]

a) Explain the following attacks in an ad hoc network: (9 marks)

   i. Worm hole attack

   ii. Gray hole attack

   iii. Rushing attack

b) Explain two best security practices to ensure security of an IoT system. (6 marks)