JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND

TECHNOLOGY SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR SCIENCE IN SECURITY AND FORENICS

3rd YEAR 2nd SEMESTER 2019/2020 ACADEMIC YEAR

MAIN CAMPUS

COURSE CODE: ICB 1308

COURSE TITLE: WIRELESS NETWORKS AND MOBILE COMPUTING

EXAM VENUE: **STREAM:**

DATE: 1/12/20

EXAM SESSION: 3-6 PM **TIME: 3.00 HOURS**

INSTRUCTIONS:

1. **Answer Question 1 (Compulsory) and ANY other two questions**

1. **Candidates are advised to write on the text editor provided, or to write on a foolscap, scan and upload alongside the question.**
2. **Candidates must ensure that they submit their work by clicking 'FINISH AND SUBMIT ATTEMPT' button at the end.**

QUESTION ONE [30 MARKS]

a) Define the term nomadic computing **(1 Marks)**

b) Give two distinctive features that qualifies a device as a communication device **(2marks)**

c) In many fields of work, the ability to keep on the move is vital in order to utilise time efficiently. The importance of Mobile Computers has been highlighted in many fields, Justify? **(8marks)**

d) The GSM emerged from the idea of cell-based mobile radio systems at Bell Laboratories in the early 1970s. Explain four necessities of the GSM technologies in Mobile computing arena. **(8Marks)**

e) State the following basic features of GSM:

i. Access method **(1 Mark)**

ii. BS transmission band **(1 Mark)**

iii. MU transmission band **(1 Mark)**

iv. Channel bandwidth **(1 Mark)**

v. Users per channel **(1 Mark)**

f) Explain three significant strengths that wireless communications systems have over their wired counterparts. **(6 Marks)**

QUESTION TWO [20 MARKS]

a) Because the amount of frequency spectrum available for mobile cellular use was limited, efficient use of the required frequencies was needed for mobile cellular coverage. In modern cellular telephony, rural and urban regions are divided into areas according to specific provisioning guidelines. Deployment parameters, such as amount of cell-splitting and cell sizes, are determined by engineers experienced in cellular system architecture. Provisioning for each region is planned according to an engineering plan that includes

- ✓ cells,
- ✓ clusters,
- ✓ frequency reuse, and
- ✓ handovers

Required:

(i) Discuss briefly each of these concepts. **(10 Marks)**

(ii) Explain any five factors one would consider in the deployment of cellular telephony **(10 Marks)**

QUESTION THREE [20 MARKS]

a) Compare and contrast FDMA and TDMA. **(6 Marks)**

b) Describe the association process (active process) which a mobile client uses to connect to a wireless Access Point. **(6 Marks)**

c) Discuss the three major transmission impairments experienced by signals. **(6 Marks)**

d) Differentiate between connection oriented and connectionless services. **(2 Marks)**

QUESTION FOUR [20 MARKS]

a) Explain the importance of standards and describe the role of ITU with regard to telecommunications in the world today. **(7 Marks)**

b) Despite the great promise, what are the key limitations associated with wireless systems? **(4 Marks)**

c) Explain briefly any four basic components of a VoIP network. **(4 Marks)**

d) Identify THREE significant strengths that wireless communications systems have over their wired counterparts. **(3 Marks)**

e) Wireless LANs can accommodate various network topologies. The standard defines a BSS as a group of stations that communicate with each other. In this regard, discuss briefly the Basic Service Set (BSS). **(2 Marks)**

QUESTION FIVE [20 MARKS]

a) Explain FOUR key factors contributing to higher security risk of wireless networks compared to wired networks **(8 Marks)**

b) JOOUST is contemplating launching of a communication space satellite as a means of facilitating wireless communication among its various campuses within the East Africa region. As a member of the advisory panel describe the advantages and disadvantages of Satellite Communication **(12 Marks)**