LAIKIPIA UNIVERSITY

UNIVERSITY EXAMINATIONS

1ST SEMESTER 2022/2023 ACADEMIC YEAR

THIRD/FOURTH YEAR EXAMINATION FOR THE DEGREES OF BACHELOR OF SCIENCE (ICT)/BACHELOR OF SCIENCE (COMPUTER SCIENCE)

BICT 315/COMP 415: WIRELESS AND MOBILE COMPUTING

STREAM: R ***TIME: 2 HRS***

DAY: TUESDAY [8.30AM – 10.30AM] ***DATE: 13/12/2022***

THIS QUESTION PAPER CONSISTS OF FOUR (4) PAGES

PLEASE DO NOT OPEN UNTIL THE INVIGILATOR SAYS SO.

INSTRUCTIONS: -

Answer question one and any other two

Use illustrations where necessary

QUESTION ONE (30 MARKS)

(a) State any FIVE advantages that wireless communication has over wired communication (5 marks)

(b) What do you understand by the term crosstalk as a transmission limitation? (2 marks)

(c) What is the difference between Public IP and Local IP? (4 marks)

(d) State FIVE advantages of wireless communication (2 marks)

(e) Identify the role of the base station. (2 marks)

(f) Explain FOUR applications of wireless communication (4 marks)

(g) What do you understand by the term wireless communication? (2 marks)

(h) The coverage area of cellular networks is divided into cells, each cell having its own antenna for transmitting the signals. Using diagrams, illustrate the two available shapes of cells. (4 marks)

(i) Differentiate between the cell size in a densely populated area and a rural location. (2 marks)

(j) Explain what CDMA stands for. (2 marks)

(k) State any three devices/environments where the Bluetooth technology has proved useful. (3 marks)

QUESTION TWO [20 MARKS]

(a) State FIVE goals which have to be achieved while designing WLANs (5 marks)

(b) What are is a cellular network? (2 marks)

(c) State TWO protocols supported in the transmission layer and three protocols supported in the application layer of the TCP/IP model. (3 marks)

(d) Define the following terms (10 marks)

i) Spectrum

ii) Range

iii) Cell
iv) Data Rate
v) Latency

QUESTION THREE [20 MARKS]

(a) State any SIX challenges that are faced when setting up wireless networks (6 marks)

(b) State THREE advantages and THREE disadvantages of satellites. (6 marks)

(c) Describe the following wireless transmission technologies/devices
- (i) Bluetooth. (2 marks)
- (ii) Broadcast Radio (2 marks)
- (iii) Microwave Communication (2 marks)
- (iv) Wi-Fi (2 marks)
- (v) Satellite (2 marks)

(d) Identify four network parts of a Wireless Application Protocol model. (4 marks)

QUESTION FOUR [20 MARKS]

(a) What do the following initials stand for? (5 marks)
- (i) GSM
- (ii) TCP
- (iii) WAP
- (iv) GPRS
- (v) GPS

(b) Explain the three wireless transmission propagation mechanisms (9 marks)

(c) Explain the following signal propagation principles in wireless media (6 marks)
- i) Reflection
- ii) Diffraction
- iii) Scattering

QUESTION FIVE [20 MARKS]

(a) Discuss any FIVE limitations that affect electromagnetic wave transmissions (10 marks)

(b) Using a diagram show the difference between a geo-synchronous orbit and a geo-stationary orbit satellite (6 marks)

(c) Discuss FOUR advantages of mobile computing. (4 marks)