



MACHAKOS UNIVERSITY

University Examinations for 2020/2021

SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY
FOURTH YEAR FIRST SEMESTER EXAMINATION FOR
BACHELOR OF SCIENCE (MATHEMATICS AND COMPUTER SCIENCE)
BACHELOR OF SCIENCE (COMPUTER SCIENCE)
SCO412: MOBILE COMPUTING AND WIRELESS TECHNOLOGY

DATE: 10/8/2021

TIME: 2:00 – 4:00 PM

INSTRUCTION

Answer question **ONE** and **Two** among the four selective questions

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Explain three requirement of Mobile IP (6 marks)
- b) Explain how collisions are managed in wireless communications using IEEE802.11 Media Access Protocol (6 marks)
- c) Jane who is a Safaricom subscriber would like to communicate with Peter who is also a Safaricom subscriber but has temporarily migrated to Uganda and he is to receive his calls through MTN network. List the process of their call setup. (7 marks)
- d) Explain the application of mobile computing in the following areas (5 marks)
 - i) Vehicles
 - ii) Medicine
- e) A student would like to create a button that demonstrates the functionality of on/off on the display screen. Write the main activity sectional code using JAVA. (6 marks)

QUESTION TWO (20 MARKS)

- a) An employee of company A travelled across different WLANs. With aid of a diagram, discuss the reasons for not experiencing network disconnectivity. (8 marks)
- b) Using a well labelled diagram, explain the concept of mobile integration (6 marks)
- c) Explain four routing strategies in an Ad Hoc networks (8 marks)

QUESTION THREE (20 MARKS)

- a) A student developed a mobile app that had challenges connecting to GSM signals and was also under constant attack. Explain the layers of the WAP architecture that the student might have not designed well (6 marks)
- b) Describe how mobile computing enables and drives M-Commerce (6 marks)
- c) Describe wireless network (wi-fi) architecture (8 marks)

QUESTION FOUR (20 MARKS)

- a) Describe the objective of 5G (5 marks)
- b) Explain any three basic features of WML (6 marks)
- c) Explain the following techniques of data management for mobile computing (9 marks)
 - i) Location based querying
 - ii) Synchronization
 - iii) Replication

QUESTION FIVE (20 MARKS)

- a) M-PESA service in Kenya was recently interrupted. In view of wireless network vulnerability,
 - i) Discuss two possible causes for this interruption (4 marks)
 - ii) Explain the possible security mechanism for each of the causes in (i). (4 marks)
- b) A student was tasked to write a programme that displays an image. The student opted to display the image using image view and a button named “Next image” that Once you click on the button ,another image should be displayed. Implement this scenario using XML code for an Android (6 marks)
- c) Using a diagram, describe satellite communication (6 marks)