



MACHAKOS UNIVERSITY

University Examinations for 2016/2017

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

**FOURTH YEAR FIRST SEMESTER EXAMINATION FOR BACHELOR OF SCIENCE
IN COMPUTER SCIENCE**

SCO 412: MOBILE COMPUTING AND WIRELESS TECHNOLOGY

DATE: 24/7/2017

TIME: 11:00 – 1:00 PM

INSTRUCTIONS

Answer question one and any other two questions

QUESTION ONE (COMPULSORY)

- a) Using a well labelled diagram describe mobile IP including encapsulation and tunnelling concepts. (10 marks)
- b) Discuss in detail any three limitations of mobile devices. (6 marks)
- c) Explain IEEE802.11 Media Access Protocol with DCF (6 marks)
- d) Explain why a Mobile user may continue to call from Mombasa to Nairobi provided that there is network. (5 marks)
- e) State three factors that distinguish peer-to-peer systems (3 marks)

QUESTION TWO (20 MARKS)

- a) Define pervasive computing and discuss a typical application of pervasive computing in organizing parties (9 marks)
- b) Using a the diagram of a GSM architecture, explain the steps of a call setup process in a home network (7 marks)
- c) Explain carrier sensing functions in mobile networks (4 marks)

QUESTION THREE (20 MARKS)

- a) Explain how the following data management concepts can address mobility (8 marks)
 - i. Query
 - ii. Replica
 - iii. Catching
 - iv. synchronization
- b) Explain DSDV MANET routing protocol (7 marks)
- c) Using a well labelled diagram, explain satellite communication (5 marks)

QUESTION FOUR (20 MARKS)

- a) Describe the WAP architecture. (9 marks)
- b) M-PESA service in Kenya was recently interrupted. In view of wireless network vulnerability, discuss the possible causes and suggest the best security mechanism to minimize them. (8 marks)
- c) Explain i-mode push with SMS (3 marks)

QUESTION FIVE (20 MARKS)

- a) Explain application of an RFID in tracking items (5 marks)
- b) Using a well labelled diagram, explain the working of a wi-fi (5 marks)
- c) If a total of 33 MHz of bandwidth is allocated to a particular cellular system which uses two 25 KHz Simplex channels to provide full Duplex voice. Compute the number of channels available per cell if the system uses: (4 marks)
 - (i) 4 cell reuse
 - (ii) 7 cell reuse
- d) Describe GPRS and state four parameters considered for defining QoS in GPRS. (6 marks)