



# MACHAKOS UNIVERSITY

University Examinations for 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FOURTH YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO 412: MOBILE COMPUTING AND WIRELESS TECHNOLOGY

DATE:

TIME:

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## INSTRUCTIONS

Answer **question ONE** and any other **TWO** questions.

### QUESTION ONE (COMPULSORY)

- a) Using typical examples, briefly explain the application of mobile computing in the following areas (9 marks)
  - i. Vehicles
  - ii. Medical
  - iii. Sales
- b) Using a well labelled diagram of a GSM architecture, explain GSM architecture (7 marks)
- c) Explain three characteristics requirements for MANETS (6 marks)
- d) Discuss four requirements of mobile IP (8 marks)

### QUESTION TWO (20 MARKS)

- a) Discuss application of Ubiquitous computing in organizing a graduation party (8 marks)
- b) Compare and Contrast: (6 marks)
  - i. TDMA and CDMA
  - ii. WiMax and Wi-fi
  - iii. GPS and GPRS
- c) Explain why traditional HTTP is not suitable for mobile device (6 marks)

**QUESTION THREE (20 MARKS)**

- a) Explain how the following data management concepts can address mobility (6 marks)
  - i. Query
  - ii. Transaction Processing
- b) Describe the route discovery of AODV routing protocol (8 marks)
- c) Explain three types of satellites (6 marks)

**QUESTION FOUR (20 MARKS)**

- a) Using a well labeled diagram, Describe the WAP architecture. (8 marks)
- b) Explain the steps of joining a network by a mobile node (8 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

**QUESTION FIVE (20 MARKS)**

- a) Explain any three advantages of using satellite communication (6 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 application of an RFID in supermarkets (6 marks)