



KENYA METHODIST UNIVERSITY

END OF 1ST TRIMESTER 2010 EXAMINATIONS

FACULTY	:	COMPUTING AND INFORMATICS
DEPARTMENT	:	COMPUTER INFORMATION SYSTEMS
UNIT CODE	:	CISY 412
UNIT TITLE	:	MOBILE COMPUTING
TIME	:	2 HOURS

Instructions:

- Answer question 1 and any other 2 questions.

Question 1 (30 marks-compulsory)

- Define the term mobile computing and mention two applications of mobile computing. (4 mks)
- In the context of wireless signal propagation, describe the phenomenon known as fading, its effect on the performance of a communication link and why it is relevant in mobile communications. (4 mks)
- Explain how cell splitting and how micro cells can increase capacity of cellular networks. (4 mks)
- Discuss the advantages of 2nd over 1st generation cellular networks. (4 mks)
- WAP was designed to tackle the data communications challenges brought about by significant limitations in mobile devices and networks. Describe those limitations. (4 mks)
- Compare and contrast WML and HTML. (4 mks)
- Explain how frequency reuse is achieved in cellular networks. (4 mks)
- Hand off is the procedure changing the assignment of a mobile unit from one BS to another as mobile moves from one cell to another. Explain the differences in handoff strategy employed by GSM and CDMA. (2 mks)

Question 2

- By use of an illustration, describe how a mobile device is able to access a website from www servers. (7 mks)
- Assume a system of 32 cells radius 1.6km. A total frequency bandwidth that supports 336 traffic channels and a reuse factor of $n=7$. What geographical area is covered and how many channels are there per cell and what number of concurrent channels are there per calls can be handled assuming FDMA channel allocation is adopted? (5 mks)

Hint: area of hexagonal cell is given by a formula $A = 1.5R^2\sqrt{3}$

- c) Explain the following wireless networks clearly stating the technologies under each. (8 mks)
- i) WPAN
 - ii) WLAN
 - iii) WMAN
 - iv) WWAN

Question 3

- a) Explain the following channel management techniques employed in most cellular systems. (12 mks)
- i) FDMA
 - ii) TDMA
 - iii) CDMA
- b) It is necessary for the network to monitor the location of every registered mobile station in order for the mobile station to connect to the network upon request. This is achieved by use of mobility management schemes. Describe the operation. (8 mks)

Question 4

- a) Explain the distinction between a mobile user and nomadic user. (4 mks)
- b) By use of an illustration describe the operation of mobile IP. (8 mks)
- c) Define GPRS and explain three key benefits of GPRS technology. (8 mks)