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RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. Degree in Applied Sciences
Fourth Year Semester II Examination October 2013

COM4201 – INTRODUCTION TO MOBILE COMPUTING

Answer **all** questions Time:**2 hours**

01.

a. What is mobile computing? Briefly describe the advantages of mobile computing.

(5*marks*)

b. Briefly describe major challenges in mobile computing.

(5*marks*)

c. Compare and contrast the mobile networks with fixed networks.

(5*marks*)

d. Outline two different types of wireless networks and briefly describe them.

(5*marks*)

(Total: 20 *marks*)

02.

a. In the basic operation of carrier sense multiple access (CSMA) medium access control (MAC) protocols, a node will sense the carrier before a transmission and data is transmitted only if the channel is idle. If the channel is busy, the node will wait for a random time and retry. This may cause the hidden terminal problem.

(i) Explain what is meant by the hidden terminal problem.

(5*marks*)

(ii) Explain a solution used to solve this problem. Your discussion should include how the proposed solution eliminates/reduces the problem.

(5*marks*)

b. Explain the architecture of a mobile cellular system. Your explanation should include all important entities of a mobile cellular system.

(10 *marks*)

c. P and Q are mobile stations in a mobile cellular network. P needs to make a call to Q. P is attached to Base Station 1 and Q is attached to Base Station 2. Give the steps of a successful conversation between P and Q.

(6*marks*)

d. What is handoff management in mobile cellular networks?

(4 *marks*)

(Total: 30 *marks*)

03.

a. What are mobile ad-hoc networks (MANETs)? Explain.

(5 *marks*)

b. Briefly describe different types of routing protocols in MANETs.

(6*marks*)

c. Dynamic Source Routing (DSR) and Ad-hoc On Demand Distance Vector Routing (ADOV) are two routing protocols in MANETs. Assuming you need to find a route from A to G in the **Figure 1**clearly show the operation of DSR and ADOV. A, B, C, D, E, F and G are mobile nodes in a mobile network.

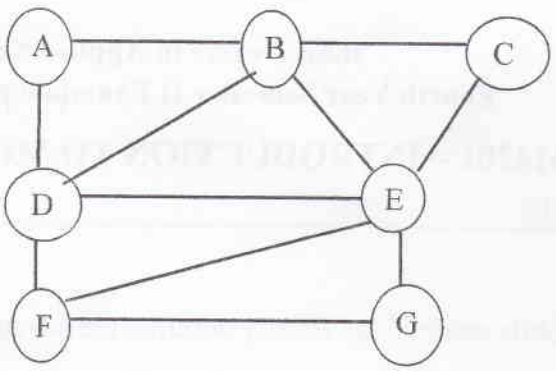

Figure 1

(10*marks*)

d. Briefly describe the use of route caching in MANETs.

(4*marks*)

(Total: 25 *marks*)

04.

a. What is mobile IP? What are the applicationsof mobile IP?

(4*marks*)

b. Comment on the terms used in mobile IP:

i. Home Address
ii. Home Network
iii. Care-of-address
iv. Foreign Network
v. Home Agent
vi. Foreign Agent
vii. Binding

(7*marks*)

c. Discuss the security concerns in mobile networks.

(4*marks*)

d. What are sensor networks? Briefly explain.

(5 *marks*)

e. Write a short note on one of the following topics.

i. Mobile Devices
ii. Mobile Applications
iii. Mobile Operating Systems

(5 marks)

(Total: 25 *marks*)