CALEDONIAN COLLEGE OF ENGINEERING

FIRST DIET

Programme: B. Sc (Honours) in Telecommunication Engineering

Session: 2010 – 11
Semester: B
Level: 4
Duration: 3 Hours
Date: 14 June 2011
Max. Marks: 75

MHH020934 Telecommunication Applications 4

CANDIDATES SHOULD ATTEMPT THREE FULL QUESTIONS

Please read the Questions carefully

Materials to be Supplied/Allowed:
Question paper (Supplied)
Blank Examination Script (Supplied)
Non-programmable calculator (Allowed)
Section A (Compulsory)

Q1(a) Explain briefly about the following terms with respect to WLAN

(i) LAN Extension
(ii) Ad Hoc networking

(b) In a CDMA system, there are three users who are transmitting using different 8-bits spreading codes. The spreading codes of the three users are as follows:

User 1: \(-1, -1, 1, 1, -1, -1, 1, 1\)
User 2: \(-1, 1, -1, 1, -1, 1, -1, 1\)

Determine the receiver output measurement for each of the following cases:

(i) User 1 transmits data bit '0', receiver attempts to recover User 1's transmission.

(ii) User 2 transmits data bit '1', receiver attempts to recover User 1's transmission.

(iii) Determine the cross correlation between channel 1 and channel 2.

(c) With an illustration explain the architecture model developed by 802.11 work group. Discuss the communication scenario when all the stations are mobile stations in the Basic Service Set (BSS).
Section B (Answer any TWO Full Questions)

Q2(a) Describe the speech signal processing for transmission over a logical traffic channel in GSM with relevant diagram. Your explanation should emphasize the data encoding, error correction and delay equalization process.

(b) Write short notes on the following related to GSM system:

(i) Home Location Register (HLR) database.

(ii) Visitor Location Register (VLR) database.

(iii) Authentication center database (AuC).

Q3(a) Describe the General Purpose Radio Service (GPRS) architecture and protocols. How many of them already exist in GSM?

(b) Explain the ZigBee protocol architecture and topologies with the help of neat sketches. Mention few practical applications of ZigBee.

(c) Determine the maximum and minimum hopping rate for a Bluetooth system divides data packets and sends one packet per hop. The length of the packet (and the corresponding hop) can be from one to five slots. Assume the length of a slot is 525 microseconds.

Q4(a) With reference to the mobile environment, answer the followings:

(i) Discuss the differences and similarities between Rayleigh and Rician models of multipath propagation.

(ii) Explain the difference between fast and slow fading.

(iii) Name and briefly define three diversity techniques.

(b) Determine the height of an antenna for a TV station that must be able to reach customers up to 100m away.