UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2011/2012

COURSE NAME	:	MOBILE RADIO COMMUNICATION
COURSE CODE	:	DAE28203 / DEP2213
PROGRAMME	:	2 DAL / 2 DET
EXAMINATION DATE	:	MARCH 2012
DURATION	:	2 ½ HOURS
INSTRUCTIONS	:	ANSWER **FOUR (4)** QUESTIONS ONLY

THIS QUESTION PAPER CONSISTS OF SIX (6) PAGES

Q1 (a) In mobile radio communication network, often a wireless operator needs to provide dedicated coverage and repeaters are often used to provide such range extension capabilities.

(i) List three (3) basic functions of repeaters.

(6 marks)

(ii) Illustrate the function of repeaters for transmission from the right to the left and from the left to the right.

(6 marks)

(iii) List advantages and disadvantages of the repeater for mobile radio network.

(5 marks)

(b) (i) List two major categories for selective calling.

(2 marks)

(ii) Explain the major categories for selective calling as listed in (Q1(b)(i)).

(6 marks)

Q2 (a) If a transmitter produces 70 W of power, express the transmited power in

(i) dBm

(3 marks)

(ii) dBW

(3 marks)

(b) If 60 W is applied to a unity gain antenna with a 900 MHz carrier frequency, the distance is 1500 m from the antenna. Find the received power at free space in

(i) Absolute

(4 marks)

(ii) dBm

(3 marks)

(c) Find the far field distance for an antenna with maximum dimension of 3M and operating frequency of 1200MHz.

(8 marks)

Q3 (a) Antenna is a way to converting the guided waves and most important equipment for mobile radio communication,

(i) List three (3) main types of basic antennas.

(3 marks)

(ii) Explain the three (3) main antennas listed in Q3(a)(i).

(6 marks)

(iii) Illustrated the three (3) main antennas listed in Q3(a)(i).

(6 marks)

(b) (i) List two (2) types of antenna arrays.

(2 marks)

(ii) Sketch the two (2) types of antenna arrays listed in Q3(b)(i) with the radiation pattern.

(8 marks)

Q4 (a) Channel allocation in mobile radio system is important from the performance point of view.

(i) Discuss the function of channel allocation.

(3 marks)

(ii) List three (3) of channel allocation schemes.

(3 marks)

(iii) Explain two (2) of the channel allocation schemes.

(4 marks)

(iv) List two (2) ways of the traffic channels can be allocated to different cell.

(2 marks)

(b) One approach to increase traffic of originating and hand off cells in a cell is to borrow free channels from neighboring cells. There are two (2) scheme of borrowing channel,

(i) Explain and illustrate the complex borrowing scheme.

(4 marks)

(ii) Explain and illustrate the simple borrowing scheme.

(4 marks)

(c) Briefly explain trunking system concept for radio spectrum.

(5 marks)

Q5 (a) Modern mobile communication systems use digital radio systems. Digital systems offer many advantages over analog systems.

(i) List four (4) characteristic of digital communications.

(8 marks)

(ii) Sketch the block diagram of digital communications with the component of the communication systems.

(6 marks)

(b) (i) Name three (3) modulation techniques for digital communication systems.

(3 marks)

(ii) From the list of (Q5(b)(i)), gives three (3) characteristic of two (2) modulation techniques are usually use for digital communication systems.

(6 marks)

(iii) Gives two (2) goals in communication system design.

(2 marks)

Q6 (a) Identify each of the following communication systems as simplex, half-duplex or full-duplex.

(i) cordless telephone.

(ii) television broadcast.

(iii) intercom with push-to-talk.

(3 marks)

(b) If a total of 33 MHz of bandwidth is allocated to a particular cellular telephone system which uses two 25 kHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if a system uses

(i) four (4) cell reuse.

(2 marks)

(ii) seven (7) cell reuse.

(2 marks)

(iii) twelve (12) cell reuse.

(2 marks)

(c) If 1 MHz of the allocated spectrum is dedicated to control channels, determine an equitable distribution of control channels and voice channels in each cell for each of the three (3) systems.

(i) four (4) cell reuse.

(3 marks)

(ii) seven (7) cell reuse.

(4 marks)

(iii) twelve (12) cell reuse.

(4 marks)

(d) Illustrated a generalized interfacing for medium to long distance data communication using intercomputer.

(4 marks)