Fomenky's

UNIVERSITY OF BUEA
COLLEGE OF TECHNOLOGY
FIRST SEMESTER EXAMINATION

MONTH: FEBRUARY
YEAR: 2019/2020
DATE: 23/02/2020
TIME ALLOWED: 13:00- 15:00 (2 Hours)
INSTRUCTIONS: Attempt All Question

COURSE MASTER: MR NDANGOH JOSEPH
COURSE CODE & NUMBER EEC405
COURSE TITLE: COMPUTER WIRELESS COMMUNICATION
Venue: CBLK I 50H
CREDIT VALUE: 4

1) a Define the following terms used in mobile networks:(i) Cellular network(ii) handover(iii)roaming (iv)propagation model

(b)Why frequency reuse in cellular networks

(c) In a cellular network ,why must there be cell overlapping between adjacent cells in the planning process?

(d)What is the purpose of power control in mobile networks?

(e) Distinguish between a theoretical model and an empirical model.

(4+2+2+2+2) pts

2(a) in two sentences maximum defines the following wireless concepts;

(i) Zig- bee (ii) wibree (iii) WIFI (iv) WIMAX (v) WWAN (2+2+2+2)pts

(b) What are the disadvantages of IrDA technology?(2pts)

(c), For an AP (access point) in a WLAN explain the concept of RTS and CTS. What is the main advantage of this and what is its main disadvantage?(8pts)

d. You are required to establish a radio link between two sites A and B on 36GHz and void of obstacles of any sort and separated by a distance of 10km.

	Point A	Point B
Antenna Gain	24dB*i*	8dB*i*
Amplifier Gain	12 dB	5dB
Transmitted power	75w	50dBm
Receiver threshold level	-88dBm	-81dBm
FeederCable attenuation	0.7dB/m	0.5dB/m
Connector losses	12dB	12dB
FeederCable length	9m	9m

i) What type of wireless network uses 36GHz(2pts)

ii) Calculate in dBm the powers received in A and B. Use the equation.

FSL = x + 20log(f) + 20log(d) where FSL is in dB, d in km, f in MHZ making sure you give the value of x. (8pts)

3a. Distinguish between these cell types (*i*) Phemto (*ii*) Micro (*iii*) macro (iv) mega (4pts)

KG

b. Give any two propagation models and bring out the merits and demerits of each. (2pts)

c. Cell splitting can be static or dynamic. Explain these two concepts and under which condition each is used. (4pts)

d. A GSM mobile operator intends to serve an estimated population of 5000 in an area. He has 21 frequencies and has to use a reuse pattern of 7. The average traffic of a user is 0.03E at peak hour.

i. What is a reuse pattern in mobile network?

ii. Sketch the reuse pattern of 7

iii. What is the advantage of a reuse pattern?

iv. The Cameroonian mobile law provider for 5 mobile operators; given PGSM 900 provides 21 frequencies per operator. They are already three operators now. GSM 1800 has also already been released by ART and is in use. If a fourth and fifth operator is coming in. how many frequencies must they each have in PGSM 900? Why?

v. Calculate the number of carrier per cell

vi. How many timeslots exist in GSM and what does that correspond to as concerns a cell?

Vii. If the blocking probability is one percent, what is the maximum traffic that can be handled by a cell?

viii. Deduce the number of users per cell.

viii. How many cells will be required to serve the given population?

(Use Elang B table provided). (10pts)

4a. List the access methods that can be used in a mobile network. Give the advantage and disadvantage each has; if any. Which is used in GSM and which is used in IMT - 2000. What problem must be solved if Sim cards of the two systems have to be swapped? (2.5pts)

b. Explain the principle of DSSS and FHSS as used in IEEE 802.11(2pts)

c. The IEEE802.11 standard, particularly IEEE802.11a, b, g, n is very much in WLANs; explain these sub-standards of IEEE802.11. 4pts)

d) How can roaming be implemented on an IEEE802.11b WLAN (1.5pts)