



NATIONAL OPEN UNIVERSITY OF NIGERIA
14-16 AHMADU BELLO WAY, VICTORIA ISLAND LAGOS
MARCH/APRIL 2016 EXAMINATION

SCHOOL OF SCIENCE AND TECHNOLOGY

COURSE CODE: CIT755 **COURSE UNIT:** 3
COURSE TITLE: Wireless Communication I

TIME ALLOWED: 3hrs
INSTRUCTION: Answer any five (5) questions.

QUESTIONS

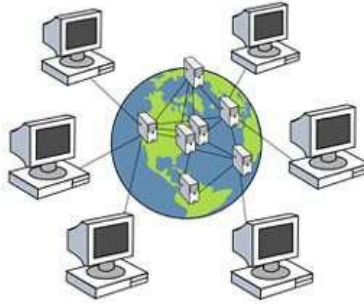
- 1a. With the aid of well-labelled diagrams, give a brief description of three (3) common techniques for linking customers to fixed channel radio links. (12 marks)
- 1b. State the actual prediction of the free space-radio propagation model. (2 marks)

[Total =14 marks]

- 2a. Determine the modulation index of an FM signal having a carrier swing of 100 kHz when the modulating signal has a frequency of 8 kHz. (10 marks)
- 2b. Name four (4) common forms of Carrier Sense Multiple Access. (4 marks)

[Total =14 marks]

- 3a. Write down four (4) implications of decreasing cell sizes in cellular systems. (4 marks)
- 3b. Study the figure below and answer the questions that follow:



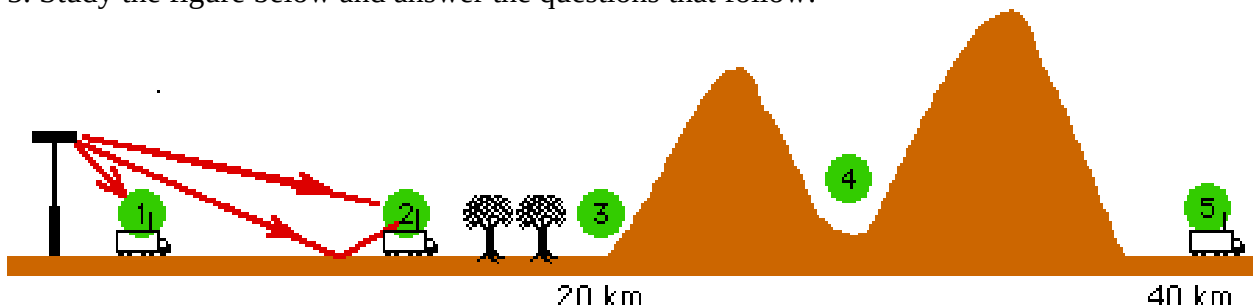
- i. Specify what this figure depicts. (2 marks)
 - ii. Give a concise description of what the figure represents (4 marks)
 - iii. How would an organisation in Sudan link up with its zonal offices? (4 marks)
- [Total =14 marks]**

4a. The Mobile Telephone Switching Office usually links up to three subsystems. Name and describe these subsystems. (12 marks)

4b. Give the full meaning of the acronym **ANFD** (2 marks)

[Total =14 marks]

5. Study the figure below and answer the questions that follow:



- 5a. Indicate what this figure represents. (2 marks)
 - 5b. What is the most appropriate prediction at location 4? (4 marks)
 - 5c. Name the specific locations where ground reflection and diffraction mechanisms interact. (6 marks)
 - 5d. State any four (4) circumstances that justify the use of wireless technology. (2 marks)
- [Total =14 marks]**

6. A cellular system has a total bandwidth of 25 MHz and control channel. It utilizes two 30 kHz simplex channels to provide full duplex voice and control channels. If the system uses a six-cell reuse pattern and 1MHz of the total bandwidth is allocated for control channels, determine:

- i. the total available channels; your answer should be approximated to the nearest whole number . (4 marks)
- ii. the number of control channels (2 marks)
- iii. the number of voice channels per cell, (4 marks)
- iv. an equitable distribution of control and voice channels in each cell. (4 marks)

[Total =14 marks]

7a. Give a brief description of the concept of line coding. (4 marks)

7b. How is multiple access accomplished in Orthogonal Frequency Division? (4 marks)

7c. Write down the full meaning of the following acronyms:

- i. LP-OFDMA (2 marks)
- ii. FC-FDE (2 marks)
- iii. WDMA (2 marks)

[Total =14 marks]