



**NATIONAL OPEN UNIVERSITY OF NIGERIA  
14-16 AHMADU BELLO WAY, VICTORIA ISLAND LAGOS  
SEPTEMBER/OCTOBER 2015 EXAMINATION**

**SCHOOL OF SCIENCE AND TECHNOLOGY**

**COURSE CODE: CIT 755**

**COURSE TITLE: Wireless Communication I**

**TIME ALLOWED: 3hrs**

**INSTRUCTION: Answer any five (5) questions.**

**QUESTIONS**

1a. As an expert in wireless communication, how would you distinguish amongst the following multiple access techniques: FDMA, TDMA, CDMA and SDMA , in the event that you had to use the following as the parameters for your comparison:

- i. Modulation
- ii. Forward error correction and ) 4 marks each
- iii. Source coding

**(12 marks)**

1b. In not more than one sentence, describe the concept of threshold crossing rate

**(2 marks)**

**[Total =14 marks]**

2. Assuming a cellular system uses a six-cell reuse pattern and 1MHz of the total bandwidth is allocated for control channels, and has a total bandwidth of 25 MHz which employs two 30 kHz simplex channels in offering full duplex voice and control channels, determine:

- i. the number of voice channels per cell, (4 marks)
- ii. the number of control channels (2 marks)

iii. the total available channels (4 marks)

iv. an equitable distribution of control and voice channels in each cell. (4 marks)

**[Total =14 marks]**

3a. In very concise terms describe the notion of line coding. (4 marks)

3b. How is multiple access accomplished in Orthogonal Frequency Division Multiple Access? (4 marks)

3c. 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]**

4a. With the aid of well-labelled diagrams, give a brief description of three (3) basic techniques for linking customers to fixed channel radio links. (12 marks)

4b. State the actual prediction of the free space-radio propagation model. (2 marks)

**[Total =14 marks]**

5a. Explain the concept of Carrier Sense Multiple Access. (6 marks)

5b. Name four (4) common forms of Carrier Sense Multiple Access. (8 marks)

**[Total =14 marks]**

6a. The Mobile Telephone Switching Office usually links up to three subsystems. Name and describe these subsystems. (12 marks)

6b. State any four (4) situations that justify the use of wireless technology. (2 marks)

**[Total =14 marks]**

7a. State the expression for determining the average non fade duration (ANFD), detailing each of the symbols used in the expression.

(6 marks)

7b. Explain the concept of transmission efficiency within the context of the useful message power and the large carrier power in wireless communications.

(8 marks)

**[Total =14 marks]**