



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
14/16, Ahmadu Bello Way, Victoria Island  
**SCHOOL OF SCIENCE AND TECHNOLOGY**  
**October, 2013 Examination**

**Course Code:** CIT 755  
**Course Title:** Wireless Communication I  
**Credit unit:** 3  
**Time:** 2½ hours  
**Instruction:** Answer any five (5) questions. Each question carries 14 marks

1. (a) List and explain the classifications of wireless data networks  
(8 marks)  
(b) List six applications of wireless technology (6 marks)
2. (a) Define the following terms  
(i) Cell cluster (2 marks)  
(ii) Frequency reuse (2 marks)  
(b) The cell shape can be of only three types of regular polygons. List these three types with the Aiof diagrams. (6 marks)  
(c) What are the advantages of decreasing a cell size (4 marks)
3. (a) Describe the following  
(i) Trellis Coded Modulation (4 marks)  
(ii) Wavelet Modulation (4 marks)  
(b) List three types of spread spectrum techniques (6 marks)
4. Assume a receiver is located 50000m from a 0.09KW transmitter. The carrier frequency is 1200MHz, free space propagation is assumed,  $G_t = 1$ , and  $G_r = 2$ , Calculate the following  
( $C = 3 \times 10^8 \text{ m/s}$ )  
(a) The power at the receiver (4 marks)  
(b) The magnitude of the Efield at the receiver antenna (6 marks)  
(c) The rms voltage applied to the receiver input assuming that the receiver antenna has a purely real impedance of 70 ohms and is matched to the receiver (4 marks)
5. (a) Interference is the major limiting factor in the performance of the cellular radio systems. State four sources of interference (4 marks)

(b) List and enumerate on the three basic methods that can be used to combine customers on to fixed channel radio link (10 marks)

6. (a) List four types of Amplitude modulation techniques (6 marks)

(b) An AM broadcast radio transfer radiates 11K watts of power, if the carrier power 8.5 K watts.

Calculate the modulation index. (8 marks)

7. (a) Briefly explain the concept of diversity for fading channels (2 marks)

(b) Describe any four classes of diversity schemes (12 marks)