系所組別： 電信管理研究所乙組

考試科目： 通訊導論

考試日期：0220，節次：3

※ 考生請注意：本試題 ☑可 ☐不可 使用計算機

1. Please explain the following terms in detail.
   (a)OFDMA (5%)
   (b)MIMO (5%)
   (c)ISI (5%)
   (d)PSTN (5%)

2. Please compare the two technologies: WiMAX and WiFi. (20%)

3. What are slow fading and fast fading in wireless communication channels? Describe the reasons they occur and the solutions to overcome the two fading effects. (20%)

4. What is the offset QPSK? What is the $\pi/4$-shifted QPSK? Describe their advantages over typical coherent QPSK. (20%)

5. A mobile communication system has the following parameters.
   Base station: transmitter power 50W, antenna gain 10dBi.
   Handset: transmitter power 0.5W, antenna gain 3dBi.
   Uplink frequency: 1710 MHz.
   Downlink frequency: 1805 MHz.
   Path loss model: $32.4+40\log R_{km}+20\log f_{MHz}$.
   The distance between the base station and the handset is 500m.
   (a) Please find the power that the base station receives from the handset. (10%)
   (b) Please find the power that the handset receives from the base station. (10%)