1. (20/100 - equally weighted parts) It is easy to demonstrate that amplitude modulation satisfies the superposition principle, whereas angle modulation does not. To be specific, let $m_1(t)$ and $m_2(t)$ be two message signals, and let $u_1(t)$ and $u_2(t)$ be the corresponding modulated versions.

   a. Show that when the combined message signal $m_1(t) + m_2(t)$ DSB modulates a carrier $A_c \cos(2\pi f_c t)$, the result is the sum of two DSB amplitude modulated signals $u_1(t) + u_2(t)$.

   b. Show that if $m_1(t) + m_2(t)$ frequency modulates a carrier, the modulated signal is not equal to $u_1(t) + u_2(t)$.

2. (25/100) Exercise 2.21 from your Textbook.

3. (30/100 = (20 (part a) + 10 (part b))/100) Exercise 2.27 from your Textbook.

4. (25/100 = (15(part a) + 10 (part b))/100)) Exercise 2.29 from your Textbook.