Assignment 9

The due date for submitting this assignment has passed.

1. If a one-port oscillator has $f_{osc} = 1.5625$ GHz, then the value of corresponding impedance ($Z_{in}$) is a 50 Ohm system, is:
   - $216.67 \Omega$
   - $2166.67 \Omega$
   - $21666.67 \Omega$
   - $216.667 \Omega$
   - $2.1667 \Omega$
   - None of the above

   Accepted Answers: 1, 2

2. In a real oscillation circuit, gain of the oscillator to 13 dB. If the saturated output power is 20 mW, then the maximum dissipation power will be:
   - 40 mW
   - 10 mW
   - 20 mW
   - 13 mW
   - 2.6 mW
   - None of the above

   Accepted Answers: 1, 2

3. The value of $K_a$:
   - 6
   - 0
   - None of the above

   Accepted Answers: 2

4. The transistor is:
   - Potentially unstable
   - Unconditionally stable
   - Unstable for all values of source and load reflection coefficients
   - None of the above

   Accepted Answers: 2

5. If a practical impedance of a transistor is $Z_{in} = 30 + j137 \Omega$, then the load impedance that can be used for the transistor to work as an oscillator is:
   - $Z_L = 30 + j137 \Omega$
   - $Z_L = 30 - j137 \Omega$
   - $Z_L = 10 + j68 \Omega$
   - $Z_L = 180 + j137 \Omega$
   - None of the above

   Accepted Answers: 2

6. Frequency tuning can be achieved using diodes because of:
   - square law operation
   - nonlinear relationship between junction current and voltage
   - large center frequency
   - resonance phenomenon

   Accepted Answers: 1

7. For a single-conversion mixer with input IF frequency of 5 GHz and desired intermediate frequency of 300 MHz, two values of LO frequency are:
   - 6 GHz, 5 GHz
   - 6 GHz, 4 GHz
   - 5 GHz, 4 GHz
   - 3 GHz, 5.5 GHz
   - 5 GHz, 6 GHz

   Accepted Answers: 1

8. Minimum number of diodes required to implement a single-balanced mixer is:
   - 2
   - 4
   - 8

   Accepted Answers: 4

9. For an RF signal at 800 MHz and LO frequency of 900 MHz, the value of IF frequency to:
   - 80 MHz
   - 100 MHz
   - 180 MHz
   - 900 MHz
   - None of the above

   Accepted Answers: 2

10. Which one among the following mixer circuits requires external LO (power)?
   - Single-diode mixer
   - Sub-harmonically pumped mixer
   - Image reject mixer
   - Double-balanced mixer
   - None of the above

   Accepted Answers: Single-diode mixer