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reviewer2@npTEL.iitm.ac.in ▼

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Course

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Unit 8 - Week 7

Due on 2017-10-11, 23:59 IST

Course outline

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Assignment-7

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

1) The third order intercept point of a non-linear device is

- A. more than the 1-dB compression point
- B. less than the 1-dB compression point
- C. equal to 1-dB compression point
- D. none of these

No, the answer is incorrect.

Score: 0

Accepted Answers:

A. more than the 1-dB compression point

5 points

2) Two single tone frequencies 3718 MHz and 3728 MHz are input to a power amplifier operating in nonlinear mode. Considering upto 5th order intermodulation effect, which of the following frequency will not have intermodulation interference?

- A. 3728 MHz
- B. 3698 MHz
- C. 3738 MHz
- D. 3708 MHz

No, the answer is incorrect.

Score: 0

Accepted Answers:

A. 3728 MHz

5 points

3) A deep space probe is moving away from earth at a velocity of $15 \text{ Km/s} \pm 3 \text{ m/s}$. The probe transmits at 14 GHz with transmitter clock drift of $\pm 10^{-9} \text{ Hz/Hz/day}$. Receiver at earth has clock drift of $\pm 10^{-13} \text{ Hz/Hz/day}$. After 30 days of silence the probe starts transmitting to earth. What search bandwidth should be used by receiver at earth?

- A. 1120 Hz
- B. 560 Hz
- C. 420 Hz
- D. 140 Hz

No, the answer is incorrect.

Score: 0

Accepted Answers:

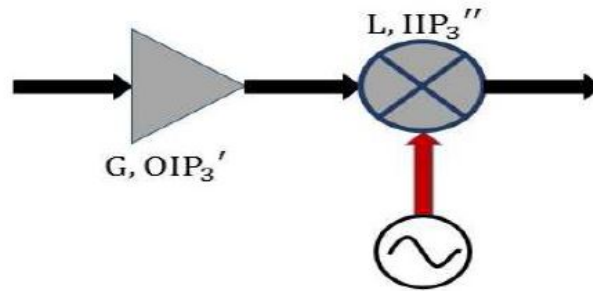
A. 1120 Hz

5 points

4)

5 points

A low-noise amplifier and mixer are shown in Figure Below. The amplifier has a gain of 20 dB and a third-order intercept point of 22 dBm (referenced at output), and the mixer has a conversion loss of 6 dB and a third-order intercept point of 13 dBm (referenced at input). Find the intercept points of the cascade network for both a perfect coherence assumption and a random-phase (noncoherence) assumption.



- A. 4.4 dBm and 4.9 dBm
- B. 6.4 dBm and 6.9 dBm
- C. 2.4 dBm and 9.2 dBm
- D. 4.2 dBm and 9.6 dBm

No, the answer is incorrect.

Score: 0

Accepted Answers:

B. 6.4 dBm and 6.9 dBm

5)

5 points

A station is allotted to start its burst 1.5 milliseconds from the start of reference frame having frame duration of 4 milliseconds. To start the burst synchronization process with an estimated one hop propagation delay of 125 milliseconds. Find when the station transmits its burst from the start of received reference burst.

- A. 1.5 milliseconds
- B. 2.5 milliseconds
- C. 3.5 milliseconds
- D. 4.5 milliseconds

No, the answer is incorrect.

Score: 0

Accepted Answers:

C. 3.5 milliseconds

6)

5 points

The 3rd order intermodulation distortion is a measure of distortion created by

- A. DC signals
- B. two carriers
- C. single carriers
- D. all of these

No, the answer is incorrect.

Score: 0

Accepted Answers:

B. two carriers

7)

5 points

The spurious free dynamic range is defined as

- A. the maximum output signal power for which the power of the third-order intermodulation product is equal to the noise level of the component, divided by the output noise level

- B. the maximum output signal power for which the power of the second-order modulation product is equal to the noise level of the component, divided by output noise level
- C. the maximum output signal power for which the power of the third-order modulation product is equal to the noise level of the component, divided by input noise level
- D. the maximum output signal power for which the power of the second-order modulation product is equal to the noise level of the component, divided by input noise level

No, the answer is incorrect.

Score: 0

Accepted Answers:

- A. the maximum output signal power for which the power of the third-order modulation product is equal to the noise level of the component, divided by output noise level

8)

5 points

Two sinusoidal signals with amplitude ratio of 2:1 are applied to a nonlinear component. Assuming Taylor series expansion, what is the relative power ratio (maximum to minimum) in dB of the resulting two 3rd order intermodulation products?

- A. 14 dB
- B. 16 dB
- C. 18 dB
- D. 22 dB

No, the answer is incorrect.

Score: 0

Accepted Answers:

- C. 18 dB

9)

5 points

A receiver has noise figure of 4 dB, 1-dB compression point and 3rd order intermodulation point (both reference to output) are 15 dBm and 25 dBm respectively, and a gain of 40 dB. If the receiver is fed with an antenna noise temperature of 150K. Find the minimum output backoff required for spurious free operation. Assume $T_0 = 290$ K, bandwidth = 1 MHz and for simplicity assume SNR = 0 dB.

- A. 11 dB
- B. 22 dB
- C. 33 dB
- D. 44 dB

No, the answer is incorrect.

Score: 0

Accepted Answers:

- B. 22 dB

10)

5 points

A deep space probe is moving away from earth at a velocity of $10 \text{ km/s} \pm 1.5 \text{ m/s}$. The probe transmits at 8 GHz with transmitter clock drift of $< \pm 10^{-9} \text{ Hz/Hz/d}$. Receiver at earth has clock drift of $< \pm 10^{10} \text{ Hz/Hz/day}$. After 45 days of silence the probe starts transmitting towards earth. Determine the maximum time offset in time of arrival of downlink transmission. Assume in the beginning the uncertainty of time and frequency of probe is zero.

- A. 86.4 milliseconds
- B. 0.10648 second

- C. 106.48 seconds
- D. 68.4 milliseconds

No, the answer is incorrect.

Score: 0

Accepted Answers:

B. 0.10648 second

You were allowed to submit this assignment only once.

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