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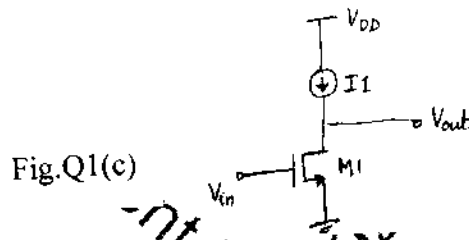
M.Tech. Degree Examination, Dec. 2013 / Jan 2014.
CMOS RF Circuit Design

Max. Marks:100

Time: 3 hrs.

Note: Answer any FIVE full questions.

- When is a system considered linear? Discuss the effects of non-linearity with respect to cross modulation ii) Intermodulation. (06 Marks)
 - Define available power gain and hence derive FRISS equation for noise figure. (07 Marks)
 - Determine the noise figure of the common source stage shown with respect to source impedance R_s . Neglect the capacitances and flicker noise of M_1 and assume I_1 is ideal. (07 Marks)



- Explain sensitivity and dynamic range with respect to RF receiver. (08 Marks)
 - A GSM receiver requires a minimum SNR of 12dB and has a channel bandwidth of 200KHz. A wireless LAN receiver on the other hand, specifies a minimum SNR of 23dB and has a channel bandwidth of 20MHz. Compare the sensitivities of these two system if both have an NF of 7dB. (04 Marks)
 - For the binary sequence 0111001101, obtain the differential encoding and decoding sequence. Draw the encoder and decoder circuits. (08 Marks)
- What is CDMA? Explain direct sequence CDMA in detail. (07 Marks)
 - Explain Weaver Architecture of image reject receiver. Also explain the problem of secondary image in weaver architecture. (08 Marks)
 - Explain the problem of image in heterodyne receiver. (05 Marks)
- Explain the operation of Bipolar LNA and derive an expression for noise figure. (08 Marks)
 - Explain the operation of passive and active CMOS mixers. (07 Marks)
 - Explain how input matching is achieved in LNA, considering any of the examples. (05 Marks)
- Explain any two basic LC oscillator topologies with necessary diagram. (08 Marks)
 - Explain the effect of phase noise in RF communication. (06 Marks)
 - Explain injection pulling and load pulling of RF oscillators. (06 Marks)
- Explain the working of charge pump PLLS. (10 Marks)
 - Explain the architecture of Integer - N synthesizer. (10 Marks)
- Mention the classification of Power Amplifiers. Explain any two types with necessary diagram. (10 Marks)
 - Explain feed back linearization technique used for power amplifiers. (10 Marks)
- Explain the noise models of BJT and MOSFET. (10 Marks)
 - What is monolithic inductor? Explain loss mechanism in monolithic inductors and give techniques to reduce the same. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Highly Sc

2/19/20

12/19/20