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CC766

M.Tech. EXAMINATION, May 2019

(Third Semester)

(B. Scheme) (Re-appear)

ECE(VLSI)

MTVLSI661

CMOS RF IC DESIGN

Time : 3 *Hours*] [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

8. Enlist various general considerations of RF power amplifier. Also briefly describe classification of power amplifiers and importance of liberalization techniques. **15**

Unit I

1. Briefly describe the role and importance of Power efficiency, Random process, distortion, Non-linearity and time variance w.r.t. RF IC design. **15**

2. (a) Compare analog and digital modulation of RF circuits. **7**

(b) What do you understand by the terms Inter-symbol interference and sensitivity in RF circuits ? Discuss in detail the operation of coherent of detection. Also, give its various advantages, disadvantages and applications. **8**

Unit II

3. Discuss the following w.r.t. RF transceiver and RF transistor :

(a) Two-step transmitter

(b) Modeling of transistor and Space model. **7+8**

4. Make a comparison between Homodyne receiver, Heterodyne receiver and Image-reject receiver. Also, explain the concept of BJT behaviour at RF frequencies. **15**

Unit III

5. Define the terms VCO, phase noise and Mixer. Also discuss the design of Mixers at GHz frequency range in RF circuits. Give its various applications. **15**

6. Describe the design and operation of the following :

(a) Bipolar LC Oscillator

(b) Quadrature signal generator. **8+7**

Unit IV

7. Explain the following :

(a) RF Synthesizer architecture

(b) Types of PLL and their applications. **8+7**