Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – WINTER • 2013

Subject code: 714404N **Date: 06-01-2014**

Subject Name: VLSI in Wireless communication systems

Time: 10.30 am – 01.00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full mark.**

Q.1	(a)	Explain the operation of QPSK modulator and demodulator with necessary block diagram also derive the necessary equations for the same	**07**
	(b)	Define noise figure and also for noisy two port networks of K- stages, each with noise, derive equation for Noise figure	**07**
Q.2	(a)	Define the types of mixers and explain the operation of Gilbert Mixer in details with necessary circuit diagram along with design steps for the same.	**07**
	(b)	Explain the design step of sigma delta modulator in detail	**07**
		OR	
	(b)	Draw heterodyne architecture of RF receiver and also explain the functions of Band selection filter, Image rejection filter and channel filter	**07**
Q.3	(a)	Discuss for receiver design, the effects of non idealities into the corresponding design parameters.	**07**
	(b)	Draw generalized LNA topology and its equivalent lumped parameter of an amplifier and explain its working	**07**
		OR	
Q.3	(a)	Compare Wideband versus Narrow band analog to digital converters	**07**
	(b)	Explain the phase detector based on EXOR gate using CMOS technology	**07**
Q. 4	(a)	Explain the multipath fading in details	**07**
	(b)	Describe the operation of charge pump with necessary generic model	**07**
		OR	
Q. 4	(a)	Draw the circuit employed to match the load with signal source in an LNA and derive the expression for Zin and comment on it.	**07**
	(b)	Explain PLL based frequency synthesizer with necessary block diagram	**07**
Q-5	(a)	Draw input bias scheme for Wideband LNA & explain	**07**
	(b)	Compare wideband LNA and Narrow band LNA	**07**
		OR	
Q-5	(a)	Explain switch capacitor based 1-bit analog to digital converter	**07**
	(b)	Explain the operations of FSK modulator and demodulator with block diagrams.	**07**

****