Registration No: | | | | | | | | | | |

Total Number of Pages: **M.TECH**
P2VDCC09

2nd Semester Regular Examination 2016-17
RF AND MIXED SIGNAL INTEGRATED CIRCUIT
BRANCH: COMMUNICATION ENGG, COMMUNICATION SYSTEMS, ELECTRONIC & COMM. ENGG, ELECTRONIC AND TELECOMMUNICATION ENGG, SIGNAL PROCESSING

Time: 3 Hours
Max Marks: 100
Q.CODE:Z845

Answer Part-A which is compulsory and any four from Part-B.
The figures in the right hand margin indicate marks.

Part – A (Answer all the questions)

Q1 Answer the following questions:***Short answer type*** **(2 x 10)**

- **a)** Write the different types of amplifier configuration in RFIC design?Which one is the most efficient among them?
- **b)** What is coupling capacitor? What is coupling coefficient?
- **c)** What is SDFR?
- **d)** Draw the block diagram for super heterodyne receive?
- **e)** Write the difference between passive and active components?
- **f)** Derive the expression for the gain constant of SR-Flip-flop which act as a phase detector?
- **g)** What is Shanon Formulation?
- **h)** What is skin effect?
- **i)** Find out the gain of CS amplifiers having load resistance R_L.
- **j)** What are negative resistance oscillators?

Part – B (Answer any four questions)

Q2 **a)** Explain how one can increase bandwidth of amplifiers Neutralization and unilateralization? **(10)**

b) A rectangular aluminum line has width 20μm, a thickness of 3μm and length of 100μm. Compute the resistance of line at DC and at 5 HZ. Assuming that all the current flows in an area of skin depth from the surface. Assume that aluminum has a resistivity of 3μΩcm. **(5)**

c) Explain bandwidth shrinkage in cascade amplifiers and also derive the expression for optimum gain per stage? **(5)**

Q3 **a)** Briefly explains about Bandwidth estimation technique in the method of open circuit time constant and short circuit time constant? **(10)**

b) Given polysilicon Resistor with the value is given,$W = 0.08\mu m, L = 20\mu m$. Calculate the values ofρ_S (in Ω/□), no. of squares of resistance and resistance. Assume that ρ for polysilicon is $9x10^{-4}$ **(10)**

Q4 **a)** Explain IP3.State and explain methods for estimating IP3? **(10)**

b) Discuss the CMOS compatible band gap reference circuit? **(5)**

c) What is Passive component? Briefly explains about woven capacitor? **(5)**

Q5 **a)** Briefly explain about PLL architecture? **(10)**

b) Briefly explains about the charge pump in PLL models? **(10)**

Q6 **a)** What is Noise Factor? Derive the expression for noise factor in terms of F_{min} and source admittance in classical two-port noise theory. **(10)**

b) Explain the operation of start-up network? **(10)**

Q7 **Write short notes (any four)** **(5x4)**

i) Tuned oscillator
ii) Skin depth
iii) Class E and Class F amplifiers
iv) Diode Ring Mixer
v) AM-PM conversion