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Reg. No. : | | | | | | | | | | |

Question Paper Code: 54402

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Fourth Semester

Electronics and Communication Engineering

15UEC402–ANALOG CIRCUITS

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. Identify the frequency range of Very high frequency oscillator. CO1- R

   (a) 30MHz-300MHz (b) 20MHz-30MHz (c) 300MHz-3GHz (d) 30MHz-3GHz

2. Clock for binary logic signals are generated using _____ Multivibrator. CO2- R

   (a) Monostable (b) Univibrator (c) Bistable (d) Astable

3. Most difficult to fabricate in an IC is CO3- R

   (a) Diode (b) FET (c) Capacitor (d) Transistor

4. _____ Instrument is used to amplify output signal of transducer. CO4- R

   (a) Integrator (b) Differential amplifier (c) PLL (d) Instrumentation amplifier

5. Sample and Hold circuit is used in CO5- R

   (a) Amplifier (b) ADC (c) Multiplexer (d) DAC

PART – B (5 x 3= 15 Marks)

6. State Barkhausen criterion and discuss the mechanism for start of oscillation. CO1- R

7. Define Rise time and storage time of Speed Up capacitor with expression. CO2- R

8. List the advantages of integrated circuit (IC) over discrete component circuit. CO3- R

9. Summarize the frequency expressions for LPF, HPF and BPF. CO4- R

10. Define capture range and lock range of PLL. CO5- R

PART – C (5 x 16= 80 Marks)

11.	(a)	Explain the construction and principle of RC Phase shift oscillator. Also derive its frequency of oscillation.	CO1- U	(16)
		Or		
	(b)	(i) Explain the principle of Colpitt's Oscillator with suitable circuit. Also derive the condition for oscillation and expression for frequency of oscillation.	CO1- U	(10)
		(ii) Draw the miller oscillator and briefly explain the operation	CO1- U	(6)
12.	(a)	(i) Draw and explain RL Integrator and Differentiator circuits, also derive the output expression. Discuss on the output of both the circuits for sinusoidal input.	CO2- App	(12)
		(ii) Draw the biased positive clippers circuit and explain with an example.	CO2- App	(4)
		Or		
	(b)	Calculate the component values of monostable multivibrator developing an output pulse of 140μs duration. Assume h_{FEmin}=20,Ic=6mA, Vcc=6V, V_{BB}= -1.5V.	CO2- App	(16)
13.	(a)	(i) Why aluminium is used for metallization? Explain metallization in detail.	CO3- U	(8)
		(ii) How ion implantations differ from diffusion techniques? Explain about ion implantation in detail.	CO3- U	(8)
		Or		
	(b)	How external frequency compensation and internal frequency compensation reduce the bandwidth of the op-amp purposely? Justify with suitable explanation and sketch.	CO3- U	(16)
14.	(a)	Define time taken for the PLL to establish lock? Derive lock in range and capture range of PLL.	CO4- App	(16)
		Or		
	(b)	Design 2nd order active low pass filter for frequency 5KHz.	CO4- App	(16)
15.	(a)	With neat diagram explain the working of linear voltage regulator using operational amplifier.	CO5- U	(16)
		Or		
	(b)	Summarize and explain the various important specifications of both D/A and A/D converters generally specified by the manufacturers.	CO5- U	(16)