Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – SUMMER 2015

Subject Code: 141101 **Date: 01/06/2015**

Subject Name: Advanced Electronics

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

Instructions:

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

Q.1	**(a)**	Draw High frequency hybrid ∏ common emitter transistor model and explain significance of each components. Write approximate value of each component.	**07**
	(b)	Derive current gain of common emitter with resistive load (R_L). Draw frequency response of it with effect of R_L.	**07**
Q.2	**(a)**	Draw Magnitude and phase spectrum of practical common emitter transistorized amplifier. Explain different region of frequency response.	**07**
	(b)	Compare R-C, Direct and transformer coupling for multistage amplifier. Also write application each coupling.	**07**
		OR	
	(b)	Three stage amplifier having gain of each stage A1=3dB, A2=50 and A3=100 and cutoff of frequencies $F_{L1}=F_{L2}=F_{L3}=$ 50Hz and $F_{H1}= F_{H2}= F_{H3}$=10KHz find overall Gain and bandwidth of three stage amplifier.	**07**
Q.3	**(a)**	If an Amplifier has a bandwidth of 200Khz and a voltage gain of 100, what will be the new bandwidth and gain if 5% negative feedback is introduced? What is the product of gain and bandwidth before and after adding negative feedback? what should be the amount of feedback if the bandwidth is restricted to 1Mhz.	**07**
	(b)	What is the negative feedback system? List the general characteristics of the negative feedback amplifier and explain any two of them with necessary equation.	**07**
		OR	
Q.3	**(a)**	Draw two stage RC coupled common emitter voltage series negative feedback transistorized amplifier and analyzed it with necessary equations.	**07**
	(b)	Design R-C phase shift oscillator using op-amp to produce a sinusoidal output at 1.5 Khz.	**07**
Q.4	**(a)**	A quartz crystal has following constants. L=0.05 H, c1= 0.02 pF, R=500Ω and c2= 12 pF. Find the values of fs and fp. If the external capacitances across the crystal changes from 5 pF to 6pF , find the change in frequency of oscillations.	**07**
	(b)	What is difference between an amplifier and oscillator? Explain concept of oscillation with barkhausen criteria.	**07**
		OR	
Q.4	**(a)**	Explain AC Analysis of Dual input, balanced output, Differential amplifier, and state how to improve CMRR.	**07**
	(b)	Classify Logic families and Define 1) Noise margin 2) Propagation Delay 3) Fan-out and Fan-in 4) Power dissipation	**07**
Q.5	**(a)**	A 5-bit R-2R ladder network with logic ‘0’=0V and logic ‘1’=5V. Find 1) Analog output due to LSB change 2) Full scale output voltage 3) Analog output for digital input 11000.	**07**
	(b)	Explain Dual slope integrator type ADC with its advantages, Disadvantages and applications of it.	**07**

OR

Q.5	**(a)**	A Dual slope ADC uses a 16-bit counter and a 4 Mhz clock rate. The maximum input voltage is +10V. The maximum integrator output voltage should be -8V when the counter has cycled through 2^n counts. Capacitor used in the integrator is 0.1 μF. Find the value of resistor of the integrator.	**07**
	(b)	Draw block diagram and Explain working of successive approximation ADC	**07**

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