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Question Paper Code: 54305

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Fourth Semester

Electrical and Electronics Engineering

15UEE405- ANALOG INTEGRATED CIRCUITS

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

PART A - (10 x 1 = 10 Marks)

1. Why oxidation process is required in IC fabrication? CO1 -R

   (a) To protect against contamination

   (b) To use it for fabrication various components

   (c) To prevent diffusion of impurities

   (d) All of the mentioned

2. Which technology is used to get cheap resistors and capacitors? CO1 -R

   (a) Thick film technology (b) Thin film technology

   (c) Thin and thick film technology (d) None of the mentioned

3. Which is not the ideal characteristic of an op-amp? CO2- R

   (a) Input Resistance –> 0 (b) Output impedance –> 0

   (c) Bandwidth –> ∞ (d) Open loop voltage gain –> ∞

4. Ideal op-amp has infinite voltage gain because CO2 -R

   (a) To control the output voltage

   (b) To obtain finite output voltage

   (c) To receive zero noise output voltage

   (d) None of the mentioned

5. Calculate the conversion time of a 12-bit counter type ADC with 1MHz clock frequent to convert a full scale input? CO3- R

(a) 4.095 µs (b) 4.095ms

(c) 4.095s (d) None of the mentioned

6. Find out the resolution of 8 bit DAC/ADC? CO3- R

(a) 562 (b) 625 (c) 256 (d) 256

7. Which characteristic of PLL is defined as the range of frequencies over which PLL can acquire lock with the input signal? CO4- R

(a) Free-running state (b) Pull-in time

(c) Lock-in range (d) Capture range

8. According to transfer characteristics of PLL, the phase error between VCO output & incoming signal must be maintained between _____ in order to maintain a lock. CO4- R

(a) 0 & π (b) 0 & π/2 (c) 0 & 2π (d) π & 2π

9. What is the dropout voltage in a three terminal IC regulator? CO5- R

(a) $|Vin| \geq |Vo|+2v$ (b) $|Vin| < |Vo|-2v$ (c) $|V\ in| = |Vo|$ (d) $|Vin| \leq |Vo|$

10. Switching regulators are series type regulators, which has _____ power dissipation & _____ efficiency. CO5- R

(a) increased, increased (b) increased, reduced

(c) reduced, increased (d) reduced, reduced

PART – B (5 x 2= 10Marks)

11. What are the different IC packages? CO1- R

12. Define common mode rejection ratio. CO2- R

13. If the gain of a closed-loop inverting amplifier is 3.9, with an input resistor value of 1.6 kilohms, what value of feedback resistor is necessary? CO3 -R

14. Define the resolution of a Digital to Analog converter. CO4 -R

15. The timing components for a PLL are 15 kOhms and 220 pF. Calculate the free-running frequency. CO5- R

PART – C (5 x 16= 80Marks)

16.	(a)	Explain briefly about the logic families of digital IC's.	CO1-App	(16)
		Or		
	(b)	List the basic process used in the silicon planer technology.	CO1- App	(16)
17.	(a)	Draw the circuit diagram of op-amp differentiator, integrator and derive an expression for the output in terms of the input.	CO2 -App	(16)
		Or		
	(b)	Explain and derive the condition for DC-characteristics of an operational amplifier.	CO2 -Ana	(16)
18.	(a)	Explain the working of an instrumentation amplifier with a circuit. Give its characteristics and applications.	CO3- Ana	(16)
		Or		
	(b)	Explain (i) R-2R ladder type DAC	CO3 -Ana	(8)
		(ii) Weighted resistor type DAC	CO3 -Ana	(8)
19.	(a)	Draw the block diagram of an Astable multivibrator using 555timer and derive an expression for its frequency of oscillation.	CO4 -U	(16)
		Or		
	(b)	Explain working of PLL using block diagram and explain any one application of the same.	CO4- Ana	(16)
20.	(a)	Explain in detail about the LM 380 power amplifier.	CO5- U	(16)
		Or		
	(b)	Draw and explain the functional block diagram of a 723 regulator.	CO5- U	(16)

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