C.U.SHAH UNIVERSITY Winter Examination-2018

Subject Name: Integrated Circuits & Applications Subject Code: 4TE04ICA1 Bran

Date: 23/10/2018

Branch: B.Tech (Electrical)

Time: 10:30 To 01:30

Marks: 70

Semester: 4 Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

| Q-1 | | Attempt the following questions: | (14) |
|-----|------------|---|------|
| | a) | The two input terminals of an op-amp are labeled as | |
| | | (a)High and low (b)Positive and negative (c)Inverting and non inverting (d) Differential and non differential | |
| | b) | When a step-input is given to an op-amp integrator, the output will be (a) a ramp. (b) a sinusoidal wave. (c)a rectangular wave. (d)a triangular wave with dc bias. | |
| | c) | What is the voltage gain of the unity follower? | |
| | | (a) 0 (b) 1 (c) -1 (d) infinity | |
| | d) | In the common mode, | |
| | | (a)both inputs are grounded (b)the outputs are connected together (c)an identical signal appears on both the inputs (d) the output signal are in-phase | |
| | e) | Specified value of CMRR for 741 op-amp is | |
| | | (a) 30 dB (b) 40 dB (c) 90 dB (d) 0dB | |
| | f) | A certain non-inverting amplifier has Ri of 1 k Ω and Rf of 100 k Ω . The closed-loop voltage gain is | |
| | | (a)100,000 (b)1000 (c)101(d)100 | |
| | g) | In a positive clipper, the diode conducts when | |
| | | (a) $Vin < Vref$ (b) $Vin = Vref$ (c)None of the mentioned (d) $Vin > Vref$ | |
| | h) | An ideal op-amp is an ideal (a) current controlled current source (b) current controlled voltage source (c) voltage controlled voltage source (d) voltage controlled current source | |
| | i) | Bistable Multivibrator has | |
| | | (a) two stable states (b) one stable states (c)quasi stable states (d) None of the above | |
| | j) | What is lock range? | |
| | k) | The output of a relaxation oscillator is | |
| | | (a) sine wave (b) square wave (c) ramp (d) spike | |
| | l) | How many op-amps are required to implement this equation $Vo = V1$? | |
| | | (a)3 (b)2 (c)1 (d)4 | |
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| | m) | Schmitt trigger uses | |
|-------|-------------|--|------|
| | | (a)positive feedback (b) negative feedback (c) compensating capacitors (d)pull up resistors | |
| | n) | Differential amplifiers are used in | |
| | , | (a)instrumentation amplifiers (b)voltage followers (c)voltage regulators (d)buffers | |
| Attem | pt any : | four questions from Q-2 to Q-8 | |
| Q-2 | 1 0 | Attempt all questions | (14) |
| | (a) | Draw & explain Current Mirror Circuit. | (07) |
| | (b) | What is Op-Amp? Draw and explain the block diagram representation of a typical Op- amp. | (07) |
| Q-3 | | Attempt all questions | (14) |
| C | (a) | Draw and explain the Block Diagram of IC 555 Timer. | (07) |
| | (b) | Explain the Block Diagram and operation of PLL. | (07) |
| Q-4 | | Attempt all questions | (14) |
| | (a) | Define: 1) Input Bias Current 2) CMRR 3) Slew rate 4) Input offset current 5) Input offset voltage | (05) |
| | (b) | Explain the Block Diagram of Voltage Controlled Oscillator(566/VCO) | (05) |
| | (c) | Explain the frequency shift keying circuit using PLL. | (04) |
| Q-5 | | Attempt all questions | (14) |
| c | (a) | Explain the Practical Integrator circuit. Explain its advantages. | (07) |
| | (b) | Draw and explain Differential input Differential output amplifier. | (07) |
| Q-6 | | Attempt all questions | (14) |
| | (a) | Design a practical integrator circuit with a d.c gain of 10, to integrate a square wave of 10 KHz. | (07) |
| | (b) | Explain Basic Inverting Schmitt trigger circuit with input & output waveforms. | (07) |
| Q-7 | | Attempt all questions | (14) |
| | (a) | Compare Butterworth filter & Chebychev Filters. | (07) |
| | (b) | Explain the working of Inverting summing amplifier. | (07) |
| Q-8 | | Attempt all questions | (14) |
| | (a) | Explain Wein Bridge oscillator. | (05) |
| | (b) | Explain Voltage to Current converter with any one application. | (05) |
| | (c) | Design a differentiator to differentiate an input signal that varies in frequency from 10 | (04) |
| | | Hz to about 500Hz.If a sine wave of 2V Peak at 500Hz is applied to the differentiator, | |
| | | write expression for its output and draw output waveform. | |



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