C.U.SHAH UNIVERSITY
Summer Examination-2016

Subject Name: Integrated Circuits & Applications
Subject Code: 4TE04ICA1   **Branch: B.Tech (EEE,EE,IC)**
Semester: 4   Date: 10/05/2016   Time: 02:30 To5:30   **Marks: 70**
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)**

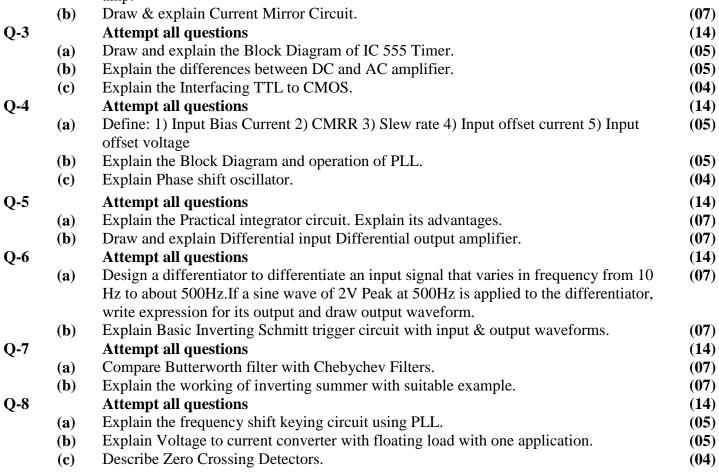**a)**   If ground is applied to the (+) terminal of an inverting op-amp, the (—) terminal will
(a)Not need an input resistor (b)Be virtual ground (c)Have high reverse current (d)Not invert the signal

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)   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

d)   For an op-amp having differential gain Av and common-mode gain Ac the CMRR is given by
(a)Av + Ac (b)Av/Ac (c)1 + (Av/Ac) (d)Ac/Av

e)   What is the voltage gain of the unity follower?
(a) 0   (b) 1   (c) –1   (d) infinity

f)   For what kind of input signal, the frequency divider can be avoided frequency multiplier?
(a)Triangular waveform (b) Square waveform (c) Saw tooth waveform (d) Sine waveform

g)   In VCO IC 565, the value of charging & discharging is dependent on the voltage applied at _____.
(a) Triangular wave output (b) Square wave output (c)Modulating input (d) All of the above

h)   Specified value of CMRR for 741 op-amp is _____.
(a) 30 dB (b) 40 dB (c) 90 dB (d) 0dB

i)   How many op-amps are required to implement this equation Vo = V1
(a)3   (b)2   (c)1   (d)4

j) The closed-loop voltage gain of an inverting amplifier is equal to

(a)The ratio of the input resistance to feedback resistance (b)The open-loop voltage gain
(c)The feedback resistance divided by the input resistance (d)The input resistance

k) Hysteresis is desirable in Schmitt-trigger, because

(a) Energy is to be stored/discharged in parasitic capacitances. (b) Effects of temperature would be compensated. (c) Devices in the circuit should be allowed time for saturation and desaturation. (d)it would prevent noise from causing false triggering

l) 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

m) Differential amplifiers are used in

(a)instrumentation amplifiers (b)voltage followers (c)voltage regulators (d)buffers

n) Define: PSRR

Attempt any four questions from Q-2 to Q-8

Q-2	**Attempt all questions**	**(14)**
(a)	What is op-amp? Draw and explain the block diagram representation of a typical Op-amp.	**(07)**
(b)	Draw & explain Current Mirror Circuit.	**(07)**
Q-3	**Attempt all questions**	**(14)**
(a)	Draw and explain the Block Diagram of IC 555 Timer.	**(05)**
(b)	Explain the differences between DC and AC amplifier.	**(05)**
(c)	Explain the Interfacing TTL to CMOS.	**(04)**
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 and operation of PLL.	**(05)**
(c)	Explain Phase shift oscillator.	**(04)**
Q-5	**Attempt all questions**	**(14)**
(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 differentiator to differentiate an input signal that varies in frequency from 10 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.	**(07)**
(b)	Explain Basic Inverting Schmitt trigger circuit with input & output waveforms.	**(07)**
Q-7	**Attempt all questions**	**(14)**
(a)	Compare Butterworth filter with Chebychev Filters.	**(07)**
(b)	Explain the working of inverting summer with suitable example.	**(07)**
Q-8	**Attempt all questions**	**(14)**
(a)	Explain the frequency shift keying circuit using PLL.	**(05)**
(b)	Explain Voltage to current converter with floating load with one application.	**(05)**
(c)	Describe Zero Crossing Detectors.	**(04)**