2007-PUNJAB UNIVERSITY

B.TECH DEGREE EXAMINATION

RADAR SYSTEMS

(ELECTRONICS AND COMMUNICATION ENGINEERING)

TIME-3HOUR
MARKS-100

PART A[10*2=20 MARKS]

1.
(a) Explain the difference between constant current bias and current mirror.

(b) What is the difference between a basic comparator and Schmitt trigger?

(c) Explain the difference between digital and linear ICs.

(d) Show how a non-inverting amplifier can be made to operate as voltage follower.

(e) Define input offset voltage and CMRR for an OP-AMP.

(f) What are advantages of adjustable voltage regulator over fixed voltage regulator?

(g) Define break frequency and bandwidth.

(h) Explain the difference between integrator and differentiator and give one application of each.

(i) What is VCO? Give tow applications that require VCO.

(j) What is voltage limiting and why is it needed?

PART B[10*8=80 MARKS]

2. An emitter based dual input, balanced output differential amplifier has the following specifications: Vcc = -VEE = 10 V. R¬c1=Rc¬2 = 2.7 kilo ohm and RE= 3.9 kilo ohm, ?ac=?dc=100, VBE = 0.715 V. Calculate:

(a) Operating current and voltage for each transistor.

(b) Voltage gain

3. Define all parameters that are used to specify an OP-AMP. List their significance.

4. Draw block diagram of IC555 and explain its working.

5. Give a theoretical method to obtain the frequency curve of an operational amplifier if the poles and zeros are not given.

6. In a triangular wave generator R2=1.2 kilo ohm,R3=6.8 kilo ohm, R1 = 120 kilo ohm, c1=0.01 micro f. Determine:

(a) Peak to peak output amplitude of triangular wave.

(b)Frequency of triangular wave.

7. What is PLL? Explain its operating principle with the help of a block diagram. Describe the function of each block in detail in block diagram. Discuss at least tow applications of PLL. 1,2,3,4

8. (a) What are switching regulators? Describe theory of switching regulators.

(b) An on-inverting zero crossing detector uses OP-AMP micro A with an open loop gain of 92 dB. If the power supply voltage are + 15 V and input offset 0 V:

(i) find the input voltage range that causes the output voltage to slew between the power supply rates.

(ii) if a 1 mV sin wave is on the input, draw the output waveform in time synchronization with input waveform.

9 (a) An inverting voltage comparator uses an OP-AMP with saturation voltages of + 12 V, R1=2 k ohm, RF=390 k ohm. The reference voltage is -3V. Determine two voltages at which the comparator will switch.

(b) Describe differential mode Instrumentation Amplifier. Find its output.