CODE NO: R059210202

SET NO. 4

2007 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

II B.TECH I SEMESTER REGULAR EXAMINATIONS
PULSE AND DIGITAL CIRCUITS
(COMMON TO ELECTRICAL & ELECTRONIC ENGINEERING, ELECTRONICS &COMMUNICATION ENGINEERING,
ELECTRONICS & INSTRUMENTATION ENGINEERING AND ELECTRONICS & TELEMATICS)

NOVEMBER 2007

Time: 3 hours
Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1.(a) What is the function of a comparator? Explain its operation.

(b) Explain the response of a low pass circuit to an exponential input is applied.

(c) Explain the response of RL circuit when a rectangular pulse is applied [4+6+6]

2. (a) Vi is a sinusoidal voltage of peak 100 volts. Assume ideal diodes. Sketch one cycle of output voltage. Determine the maximum diode Current.

(b) Explain positive peak clipping with reference voltage. [12+4]

3. Write Short notes on:

(a) Diode switching times

(b) Switching characteristics of transistors

(c) FET as a switch . [4+8+4]

4. In the monostable circuit of the given figure 4 the resistor R is connected to an auxiliary supply V1 instead of VY Y . If A2 is in saturation or clamp and if A1 is OFF in the stable state, verify that the gate time T is given by Eq. T =t ln(VYY+I1RY-Vs)/(VYY-V?) with VY Y replaced by V1.

5. (a) How are linearly varying current waveforms generated?

(b) In the boot strap circuit shown in figure5 Vcc = 25 V, VEE = -15 V, R = 10 K ohms, RB = 150 K ohms, C = 0.05 µF. The gating waveform has a duration of 300 µs. The transistor parameters are hie = 1.1Kohms, hre = 2.5 x 10-4 K ohmshfe =50 hoe = 1/40K ohms.

i. Draw the waveform of IC1 and Vo , labeling all current and voltage levels,

ii. What is the slope error of the sweep?

iii. What is the sweep speed and the maximum value of the sweep voltage?

iv. What is the retrace time Tr for C to discharge completely?

v. Calculate the recovery time T1 for C1 to recharge completely.

6. (a) Explain how monostable multivibrator is used as frequency divider?

(b) Draw and explain the block diagram of frequency divider without phase jitter.

[8+8]

7. (a) Why are sampling gates called linear gates?

(b) What are the other names of a gate signal?

(c) Compare the unidirectional and bi-directional sampling gates. *[6+4+6]*

8. (a) What are the basic logic gates which perform almost all the operations in Digital communication systems.

(b) Give some applications of logic gates.

(c) Define a positive and negative logic systems.

(d) Draw a pulse train representing a 11010111 in a synchronous positive logic digital system