

III B.Tech II Semester Supplementary Examinations, January 2005
DIGITAL ELECTRONICS
(Mechatronics)

Time: 3 hours**Max Marks: 70**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Draw the circuit for Transistor (BJT) clipper and explain its working with the help of waveforms.
(b) A negative series unbiased diode clipping circuit is to have an input of 30V. The output current from the circuit is to be 10mA. The negative peak output voltage should not exceed 0.5V. Calculate the value of resistor to be used in the circuit. Give the specifications of the diode to be used. The reverse saturation current of the diode is given as 3μ A.
2. (a) Draw the circuit for biased negative clamping circuit and explain its working with the help of waveforms.
(b) A negative voltage clampers has 2 KHZs sequence wave input with an amplitude of $\pm 10V$. Signal source resistance $R_s = 200 \Omega$. The tilt on the output waveform should not exceed 1%. Design a suitable clamping circuit.
3. (a) Explain the terms:
 - i. Sweep speed error
 - ii. Displacement error
 - iii. Free running mode
 - iv. Pertaining to sweep circuits
(b) An exponential sweep circuit is constructed using a capacitor C and charging it through a resistor R from supply voltage V. If the peak sweep voltage is V_s , prove that the slope error is given by $e_s = V_s/V$.
4. Draw the circuit for triggered current time base generator and explain its working with the help of waveforms and equations.
5. (a) Give the block schematic with explanation to realize 8 bit adder as a cascade of two 4-bit adders.
(b) Draw the truth table with 4 variables and explain how it can be realized using 8:1 multiplexer.
6. (a) If \overline{Q} output of a D-type Flip-Flop is connected to D input, can it act as toggle switch? Explain.
(b) Convert S-R Flip-Flop to J-K Flip- Flop.
7. (a) With the help of sketches explain the working principle of LCDs.
(b) Compare LED's and LCD's in all respects.

8. Write notes on any TWO of the following:

- (a) Monostable multi vibrator
- (b) Schmitt trigger circuit
- (c) Dot matrix display

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