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SET NO. 1

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) Prove that an RC circuit behaves as a reasonably good integrator if $RC > 15T$,
Where T is the period of an input ' $E_m \sin \omega t$ '.
- (b) What is the ratio of the rise time of the three sections in cascade to the rise time of Single section of low pass RC circuit. [8+8]
2. (a) Draw the circuit diagram of slicer circuit using Zener diodes and explain its operation with the help of its transfer characteristic.
- (b) Draw the circuit diagram of emitter coupled clipper. Draw its transfer characteristics indicating all intercepts, slopes and voltage levels derive the necessary equations. [8+8]
3. (a) Explain the terms pertaining to transistor switching characteristics.
 - i. Rise time.
 - ii. Delay time.
 - iii. Turn-on time.
 - iv. Storage time.
 - v. Fall time.
 - vi. Turn-off time.
- (b) Give the expression for risetime and falltime in terms of transistor parameters and operating currents. [6+10]
4. In the nonsaturated binary , the avalanche diodes $D1$ and $D2$ are nominally identical, as are diodes $D3$ and $D4$. The breakdown voltage V_Z of $D3$ and $D4$ is larger than the breakdown voltage V_Z of $D1$ and $D2$. Verify that the transistors do not enter the saturation region. Assume that $D3$ and $D4$ are always in the breakdown region and that either $D1$ or $D2$ but not both, is in the breakdown region. Then verify these assumptions

5. (a) Draw and clearly indicate the restoration time and flyback time on the typical waveform of a time base voltage.

(b) Derive the relation between the slope, transmission and displacement errors

(c) Explain how UJT is used for sweep circuit? [6+4+6]

6. (a) What do you mean by synchronization ?

(b) What is the condition to be met for pulse synchronization?

(c) Compare sine wave synchronization with pulse synchronization? [4+6+6]

7. (a) Why are sampling gates called Selection circuits?

(b) What are the advantages of unidirectional sampling gates?

(c) What are the applications of sampling gates? [6+4+6]

8. (a) With the help of circuit diagram explain the purpose of clamping diode in a positive diode AND gate.

(b) Explain the effect of diode capacitance on the output pulse of diode AND gate.

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