

## II B.Tech I Semester(RR) Supplementary Examinations, May/June 2010

## PULSE AND DIGITAL CIRCUITS

(Common to Electrical & Electronic Engineering, Electronics & Communication Engineering and Electronics & Computer Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions  
All Questions carry equal marks

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1. (a) A 10-Hz square wave is fed to an amplifier. Calculate and plot the output waveform under the following conditions: The lower 3dB frequency is [10]
  - i. 0.3 Hz,
  - ii. 3.0 Hz
  - iii. 30Hz.
- (b) Draw the output waveform of an RC High pass circuit with a square wave input under different time constants. Explain the same. [6]
2. (a) For a shunt diode clipper circuit  $V_i = 20 \sin \omega t$ ,  $V_R = 10V$  is obtained from a potential divider circuit using 100V supply and 10K potentiometer [10]
  - i. Draw the circuit diagram.
  - ii. If  $R_f = 50 \Omega$ ,  $R_r = \infty$  and  $V_r = 0$ , sketch the transfer characteristic, output waveform for the given  $V_i$ .
- (b) Draw the basic circuit diagram of a DC restorer circuit and explain its operation. Sketch the output waveform for a sinusoidal input signal. [6]
3. (a) Describe the switching times of BJT by considering the charge distribution across the base region. Explain this for cut off, active and saturation regions. [8]
- (b) Define the following terms:
  - i. storage time
  - ii. delay time
  - iii. rise time
  - iv. fall time. [8]
4. Describe multivibrators from the viewpoints of construction, principle of working, classification based on the output states, applications and specifications. Mention one specific application of each. [16]
5. (a) Write important applications of time-base circuits. With reference to time base circuits define the following terms: [8]
  - i. Flyback time
  - ii. Transmission error.
- (b) What is meant by triggered sweep? What are the merits and demerits of triggered sweep circuits. [8]
6. (a) Explain the principle of "synchronization" and 'synchronization with frequency division'. [8]
- (b) Explain the method of pulse synchronization of relaxation devices, with examples. [8]
7. (a) Distinguish between logic gate and sampling gate. [4]
- (b) Why is a sampling referred as a linear gate? [4]
- (c) Illustrate the principle of operation of a linear gate using series switch and shunts witch. What are the disadvantages? [8]
8. What is meant by blocking oscillator? Explain the principle of operation of monostable blocking oscillator with base timing. Sketch the current waveforms and derive an expression for current pulse width. [16]

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