



RN-6771

**B. E. III (Sem. V) (Comp.) Examination**  
**May / June - 2010**  
**Pulse & Waveform Circuits**

Time : 3 Hours]

[Total Marks : 100

**Instructions :**

(1)

नीचे दृशविवेक निशानीवाणी विगतो उत्तरवडी पर अवश्य लखवी.  
Fillup strictly the details of signs on your answer book.

Name of the Examination :  
**B. E. 3 (Sem. 5) (Comp.)**

Name of the Subject :  
**Pulse & Waveform Circuits**

Subject Code No. : **6 7 7 1** Section No. (1, 2,.....): **1&2**

Seat No. :

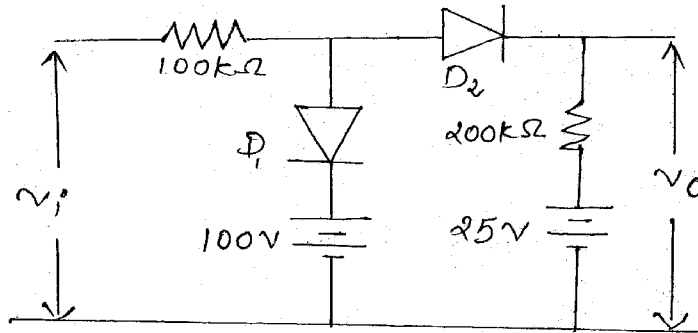
Student's Signature

- (2) Attempt all questions.  
(3) Assume data if necessary.  
(4) Figures to the right indicate full marks.

**SECTION - I**

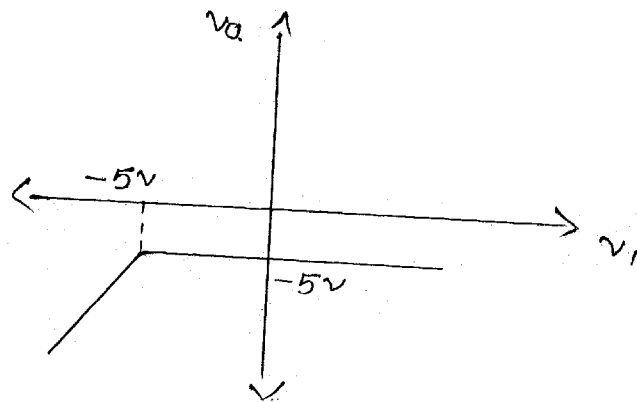
- 1 (a) Answer the following : 10
- (i) Define x'wission error.  
(ii) \_\_\_\_\_ is the process of cutting and removing the part of the i/p waveform.  
(iii) \_\_\_\_\_ attenuates all high frequency signals and x'wimms only low frequency signals.  
(iv) The process of converting pauses into pips is called \_\_\_\_\_.  
(v) In \_\_\_\_\_ clamping a reference voltage is connected in series with diode (bias/unbias)  
(vi) The frequency at which the gain is \_\_\_\_\_ of its maximum value is called the cut-off frequency.  
(vii) Define :  
(a) Positive clamping  
(b) Negative clamping  
(viii) Application of voltage comparator.
- (b) Explain low pass filter and with its frequency responses. Also find out the cut-off frequency equation for the sinusoidal i/p. What will be the lower cut off frequency of the low pass filter. Also give the criteria for the RC circuit to work as low pass CKT. 10

- 2 (a) Explain practical clamping circuit. 7  
 (b) The i/p  $V_i$  to the two level clipper shown in figure 8  
 varies linearly from 0 to 150 V. Sketch the o/p waveform  $V_o$ . Show all the necessary calculations. Assume ideal diodes.

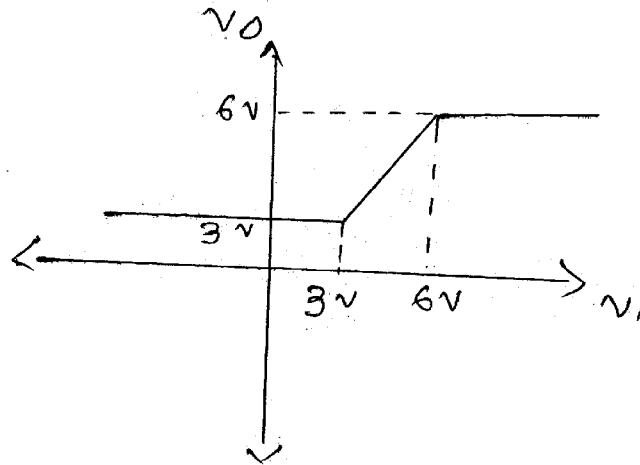


OR

- 2 (a) Explain x'fer clipper ckt with necessary waveforms. 8  
 (b) A square wave whose peak to peak amplitude is 2V. 7  
 The duration of the positive section is 0.1S and that of the negative section is 0.2S. If this waveform is impressed upon an RC integrating ckt whose time constant is 0.25, what are the steady state maximum and minimum values of the output waveform?
- 3 Attempting any three : 15  
 (i) Explain and prove clamping ckt theorem.  
 (ii) Explain comparator.  
 (iii) Design a ckt having the X'fer char. as shown below.



(iv) Design a ckt having the x'fer char. as shown below.



## SECTION - II

4 (a) Answer the following :

10

- (i) The \_\_\_\_\_ is a comparator with positive feedback that converts an irregular waveform into square waveform.
- (ii) State the applications of V-F converter.
- (iii) The comparator with negative feedback is said to exhibit hysteresis. - True/False.
- (iv) The circuits that limit the output of an op-amp to a predetermined value are called \_\_\_\_\_.
- (v) The VCO generates an output frequency that is directly proportional to its input voltage. - True/False.
- (vi) The frequency range of ICL 8038 function generator is \_\_\_\_\_.
- (vii) State the applications of window detector.
- (viii) The absolute-value circuit may be used as a full-wave rectifier if the input is a sine wave. - True/False.
- (ix) The condition required for proper operation of peak detector circuit is \_\_\_\_\_.
- (x) In PLL the capture range is never greater than the lock range. - True/False.

- (b) Match the following : 4
- | A                                 | B  |
|-----------------------------------|--|
| (i) ZCD                           | (i) Used in communication                                      |
| (ii) Peak Detector                | (ii) Sine to square conversion                                 |
| (iii) Absolute - Value<br>Circuit | (iii) Output swings<br>positively only                         |
| (iv) Sample and<br>hold circuit   | (iv) Measure maximum<br>values of non-sinusoidal<br>waveforms. |
- (c) State the important characteristics of comparator. 2
- 5** (a) Explain positive and negative clippers using op-amp 741. 8
- (b) Design the inverting and non-inverting schmitt trigger circuit with  $V_{ut} = -0.5V$  and  $V_{lt} = -3.1 V$  and  $\pm V_{sat} = \pm 14 V$ . 8
- OR**
- 5** (a) Explain the internal block diagram of ICL 8038 function generator. 8
- (b) Consider 9400 V/F converter, if  $V_{in} = 2V$ ,  $R_{in} = 1 M\Omega$ ,  $V_{ref} = -5V$  and  $C_{ref} = 180 pF$ , draw the circuit with all its external connections and
- (i) Calculate the value of output frequency  $F_o$  and
- (ii) Draw the  $F_o$  and  $F_o/2$  waveforms. Initially 10 KHz full-scale output frequency. 8
- 6** Attempt any **three** : 18
- (i) Explain F to V converter.
- (ii) Draw and explain block diagram of VCO.
- (iii) Sample and hold circuit.
- (iv) Window detector
- (v) Peak detector.