

R09

Code No: 09A40403

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B.Tech II Year II Semester Examinations, June-2014

PULSE AND DIGITAL CIRCUITS

(Common to ECE, BME, ETM)

Time: 3 hours

Max. Marks: 75

Answer any five questions  
All questions carry equal marks

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- 1.a) Define Linear wave shaping. Obtain the response of a high pass RC circuit for exponential input.
- b) In an RC low pass circuit  $R = 2k\Omega$  and  $C = 1\mu F$ . A square wave with half period of  $5\mu s$  is applied as input to this circuit. Determine the output waveform.
- 2.a) Explain the effect of diode characteristics on clamping voltage.
- b) Sketch the steady state output voltage for the clamper circuit shown in Fig. 1 and locate the output d.c level and the zero level. The diode used has  $R_f = 1K\Omega$ ,  $R_r = 600 K\Omega$ ,  $V_\gamma = 0$ ,  $C = 0.1\mu F$  and  $R = 20 K\Omega$ . The input is a  $\pm 20V$  square wave with 50% duty cycle.

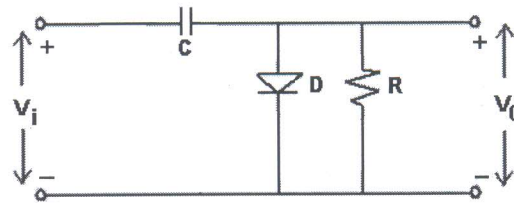


Fig. 1

- 3.a) Give a brief note on piece-wise linear diode characteristics.
- b) Define the different switching times of a transistor with suitable collector current versus time characteristics.
4. What is a monostable multivibrator? Explain with the help of a neat circuit diagram the principle of operation of a monostable multivibrator, and derive an expression for pulse width. Draw the waveforms at collector and bases of both transistors.
- 5.a) Draw the diagram of transistor miller time base generator and explain.
- b) Explain about methods of linearity improvement.
- 6.a) Why are sampling gates called transmission gates?
- b) With the help of a neat diagram, explain the working of two-diode sampling gate. What are the drawbacks of two diode sampling gate?
- 7.a) With the help of neat waveforms, explain frequency division with respect to a Sweep circuit.
- b) Explain the method of pulse synchronization of relaxation devices, with examples.

- 8.a) Compare the performance of various logic families with reference to power dissipation, propagation time delay, fan-in and fan-out.
- b) Draw the diagram of OR gate using diodes and transistors and explain the operation.

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