

B.Tech II Year - II Semester Examinations, April/May-2012
PULSE AND DIGITAL CIRCUITS
(Electronics & Instrumentation Engineering)

Time: 3 hours

Max. Marks: 80

Answer any five questions
 All questions carry equal marks

- - -

- 1.a) An inductor does not allow sudden changes in current and a capacitor does not allow sudden changes in voltage. Justify with relevant equations.
 - b) What are the disadvantages of RL linear wave shaping circuit compared to RC circuit?
 - c) A symmetrical square wave of $\pm 5V$ at a frequency of 5 KHz is applied to a high pass RC circuit with a cut-off frequency of 20 KHz. Sketch the steady state input and output voltage waveforms. Calculate the steady state output voltage levels? [4+4+8]
- 2.a) Derive the expression for percentage tilt for a square wave output of RC high pass circuit.
 - b) A voltage signal of $10 \sin \omega t$ is applied to the circuit with ideal diodes shown in Figure.1. Estimate the maximum & minimum values of output waveform and maximum current through each diode. Also draw the input-output waveforms with proper explanation. [6+10]

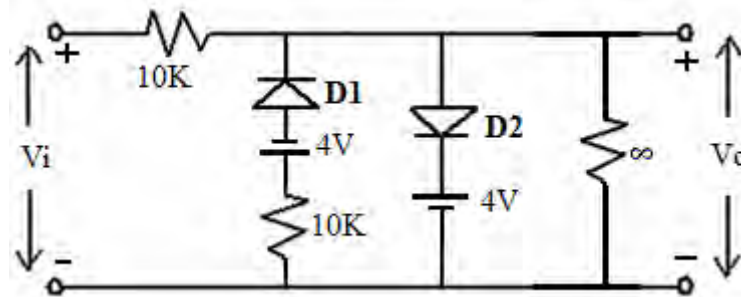


Figure.1

- 3.a) Write a short note on voltage comparators.
 - b) 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.

 [4+12]
- 4.a) Explain the operation of emitter coupled bistable multivibrator.
 - b) Explain how an astable multivibrator can be used as a voltage to frequency converter. [8+8]

- 5.a) Draw and explain the circuit of transistorized Miller sweep generator. Show that the sweep speed for Miller circuits is same as in the case where the capacitor, C charges through a resistor, R directly from the source, V.
- b) Draw and explain the circuit of transistorized Bootstrap sweep generator. Derive an expression for retrace interval, T_r . [8+8]
- 6.a) With the help of a circuit diagram and waveforms, explain frequency division of an astable multivibrator with pulse signals.
- b) Describe synchronization with 2:1 frequency division with neat waveforms. [8+8]
- 7.a) Illustrate the principle of sampling gates with series and parallel switches and compare them.
- b) Explain with circuit diagram the operation of a two input sampling gate which does not have any loading effect on control signal. [8+8]
- 8.a) Compare the diode controlled and RC controlled astable operated blocking oscillator.
- b) Draw the circuit diagram for Schmitt trigger using transistors and explain its operation. Derive the expressions for UTP and LTP. [8+8]

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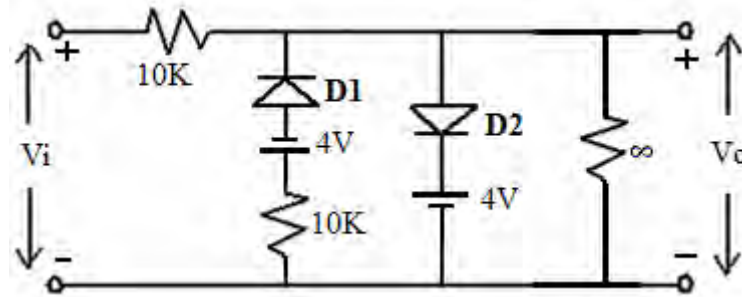


Figure.1

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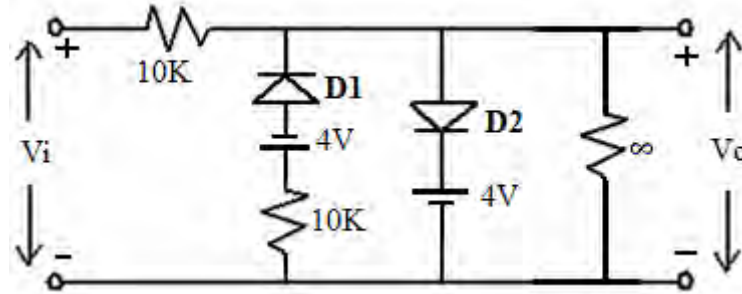


Figure.1

- 7.a) Write a short note on voltage comparators.
- b) Explain the terms pertaining to transistor switching characteristics.
- | | | |
|-------------------|-----------------|--------------------|
| i) Rise time. | ii) Delay time. | iii) Turn-ON time. |
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- [4+12]
- 8.a) Explain the operation of emitter coupled bistable multivibrator.
- b) Explain how an astable multivibrator can be used as a voltage to frequency converter. [8+8]

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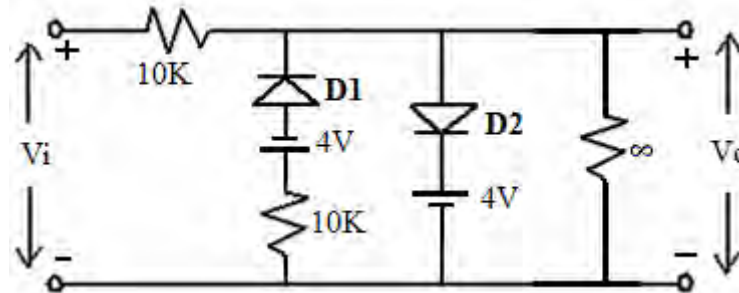


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