II B.Tech I Semester Examinations,May/June 2012
PULSE AND DIGITAL CIRCUITS
Common to Electronics And Instrumentation Engineering, Electrical And
Electronics Engineering

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Draw the circuit diagram of discrete-component regenerative comparator.

   (b) Draw the transfer characteristic showing hysteresis.   [16]

2. (a) What is meant by linear wave shaping

   (b) A pulse of amptitude 5V and duration $20\mu sec$ is applied to high pass RC circuit having R= $10K\Omega$ and C= 1000pf. calculate the output amptitude and sketch the o/p wave form.

   (c) Draw the response of low pass RC circuit for ramp i/p signal.
                                                                    [2+10+4]

3. (a) In a current sweep circuit, explain how linearity correction is made through adjustment of driving waveform.

   (b) Write the basic mechanism of transistor television sweep circuit.   [16]

4. (a) For the circuit shown in figure 1 an input voltage V_i linearly from 0 to 150V is applied. Sketch the output waveform V_0 to the same time scale. Assume ideal diodes.
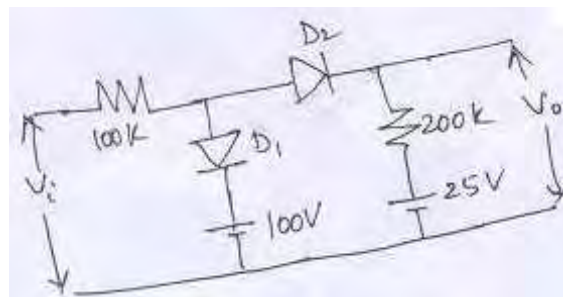

Figure 1

   (b) What is meant by a d.c restoration circuit and explain?   [12+4]

5. (a) Draw the circuit diagram of diode-transistor logic NOR gate and explain its operation.

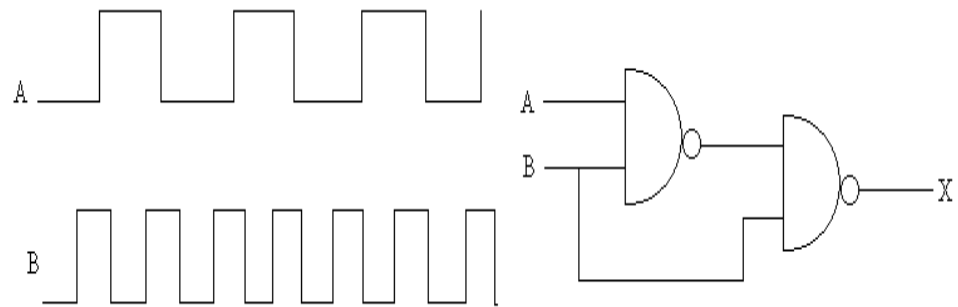   (b) Draw the output waveform X for the given inputs shown in figure 2.

Figure 2

6. (a) What are the applications of sampling gates?

   (b) What are the advantages and disadvantages of unidirectional diode gate?

   (c) Discuss the operation of the four diode bi-directional sampling gate. [4+4+8]

7. (a) With the help of a circuit diagram and waveforms explain frequency division of monostable multivibrator with pulse signals.

   (b) A symmetrical astable multivibrator using germanium transistors and operating from a 10V collector supply voltage has a free period of 1000 μsec. Triggering pulses whose spacing is 750 μsec are applied to one base through a small capacitor from a high impedance source. Find the minimum triggering pulse amplitude required to achieve 1 : 1 synchronization. Assume typical junction voltage of the transistor and that the timing portion of the base waveform is linear. [16]

8. (a) Explain the revese recovery of a semi conductor diode. How does the recovery time place a limitation on the diode speed?

   (b) Write short notes on the switching times of a transistor. [8+8]

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                                                                    [2+10+4]

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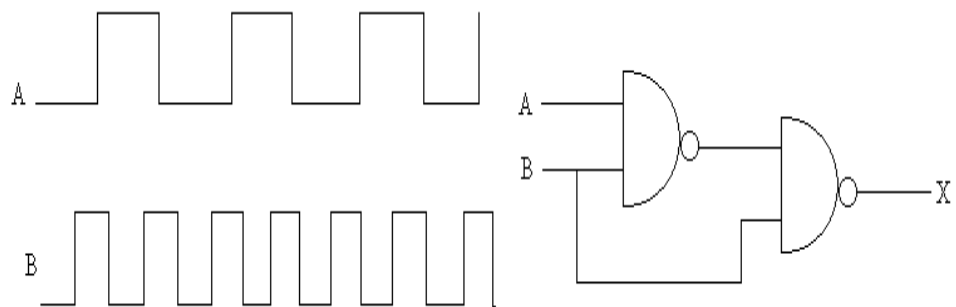   (b) Draw the output waveform X for the given inputs shown in figure 3.

Figure 3

4. (a) Explain the revese recovery of a semi conductor diode. How does the recovery time place a limitation on the diode speed?

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8. (a) For the circuit shown in figure 4   an input voltage V_i linearly from 0 to 150V is applied. Sketch the output waveform V_0 to the same time scale. Assume ideal diodes.
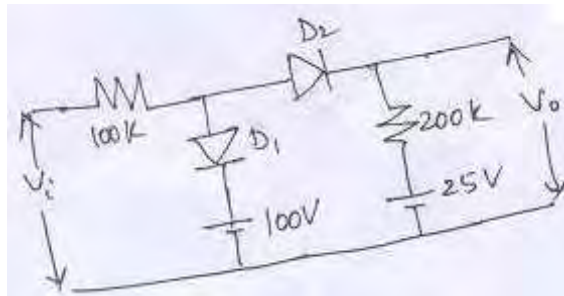

Figure 4

 (b) What is meant by a d.c restoration circuit and explain? [12+4]

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    (b) A pulse of amptitude 5V and duration 20μsec is applied to high pass RC circuit having R= 10KΩ and C= 1000pf. calculate the output amptitude and sketch the o/p wave form.

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                                                                                     [2+10+4]

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    (b) Write the basic mechanism of transistor television sweep circuit.   [16]

5. (a) Draw the circuit diagram of diode-transistor logic NOR gate and explain its operation.

    (b) Draw the output waveform X for the given inputs shown in figure 5.
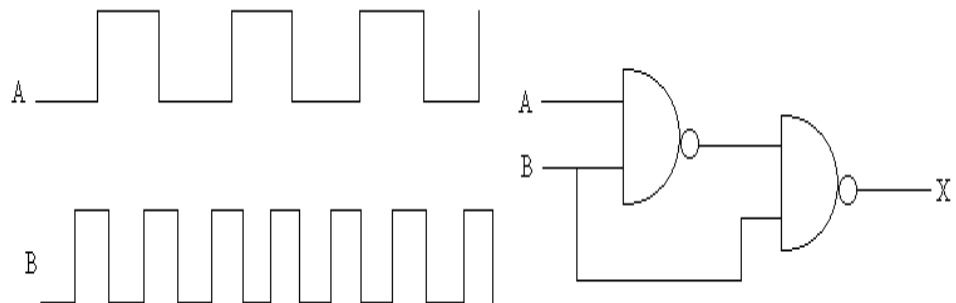

Figure 5

6. (a) With the help of a circuit diagram and waveforms explain frequency division of monostable multivibrator with pulse signals.

(b) A symmetrical astable multivibrator using germanium transistors and operating from a 10V collector supply voltage has a free period of 1000 μsec. Triggering pulses whose spacing is 750 μsec are applied to one base through a small capacitor from a high impedance source. Find the minimum triggering pulse amplitude required to achieve 1 : 1 synchronization. Assume typical junction voltage of the transistor and that the timing portion of the base waveform is linear. [16]

7. (a) For the circuit shown in figure 6 an input voltage V_i linearly from 0 to 150V is applied. Sketch the output waveform V_0 to the same time scale. Assume ideal diodes.
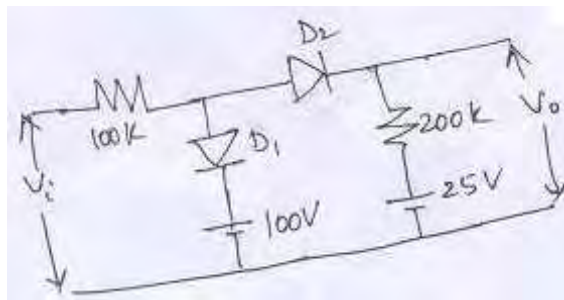

Figure 6

(b) What is meant by a d.c restoration circuit and explain? [12+4]

8. (a) Explain the revese recovery of a semi conductor diode. How does the recovery time place a limitation on the diode speed?

(b) Write short notes on the switching times of a transistor. [8+8]

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R07   **Set No. 3**

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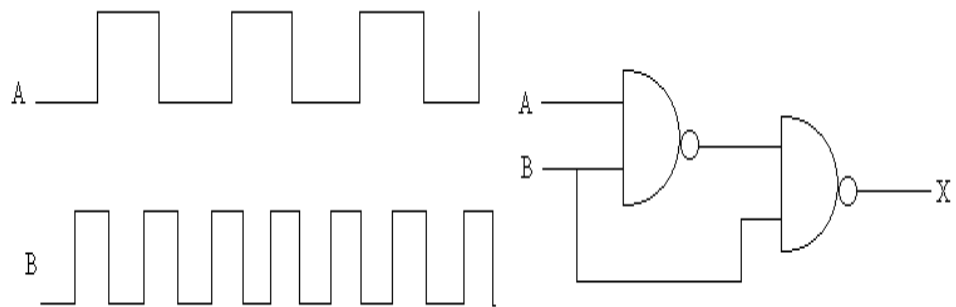   (b) Draw the output waveform X for the given inputs shown in figure 7.

Figure 7

3. (a) What is meant by linear wave shaping

   (b) A pulse of amptitude 5V and duration 20μsec is applied to high pass RC circuit having R= 10KΩ and C= 1000pf. calculate the output amptitude and sketch the o/p wave form.

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4. (a) In a current sweep circuit, explain how linearity correction is made through adjustment of driving waveform.

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5. (a) For the circuit shown in figure 8   an input voltage V_i linearly from 0 to 150V is applied. Sketch the output waveform V_0 to the same time scale. Assume ideal diodes.
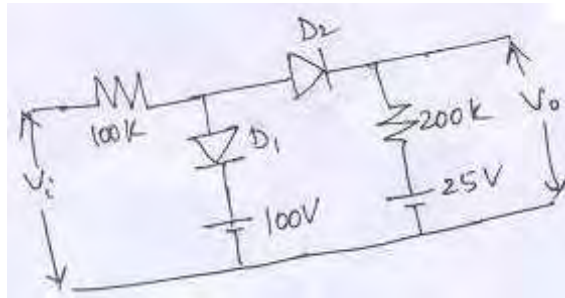
Figure 8

(b) What is meant by a d.c restoration circuit and explain? [12+4]

6. (a) With the help of a circuit diagram and waveforms explain frequency division of monostable multivibrator with pulse signals.

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