



SE-6785

B. E. III (Sem. - V) Examination
May/June - 2011
Pulse & Switching Circuit

Time : 3 Hours]

[Total Marks :100

Intructions :

(1)

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

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

Name of the Subject :
Pulse & Switching Circuit

Subject Code No. : 6 7 8 5 Section No. (1, 2,.....): Nil

Seat No. :

Student's Signature

(2) Attempt all the questions.

(3) Figures to the right indicate full marks.

(4) Use of scientific calculator (82-fx, 82-Ms, 100-fx and 100-Ms or equivalent) of other companies is allowed.

(5) Assume suitable data whenever necessary.

1 (a) Answer the following questions. (Each of 1Marks)

(10)

1. What do you mean by linear wave shaping?
2. State the criteria for good differentiation.
3. What so you mean by comparator?
4. State other names of clamper circuit.
5. Write atleast two application of clipper circuit.
6. What is the difference between clipping circuit and clamping circuit?
7. Define the term rise time.
8. What do you mean by cut off frequencies?
9. Give the definition of attenuator.
10. The low pass RC circuit is also called as _____.

(b) Analyze the following Clipping Circuits, assuming ideal diode operation. Assume input signal is sinusoidal i.e. $V_i = V_m \sin \omega t$. Draw to the scale the transmission characteristic & output signal waveform with input signal clearly indicating ON & OFF condition of the diode. Make reasonable approximation. (06)

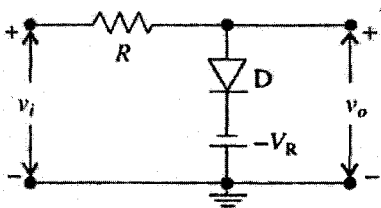


Fig. A

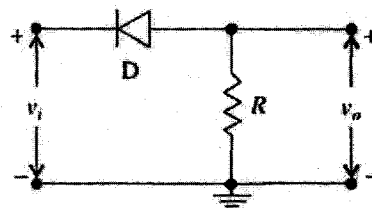


Fig. B

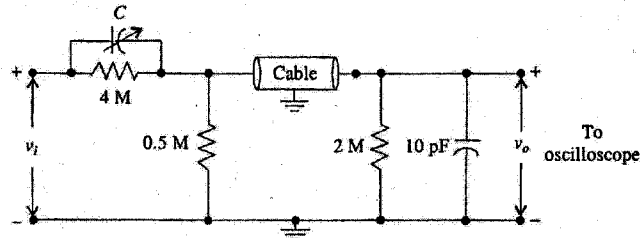
(c) Explain basic negative clamper circuit. (04)

2(a) Explain in detail the response of low pass RC circuit when excited by square wave input. (08)

(b) An oscilloscope test probe is indicated in figure below. Assume that the cable capacitance is (07)

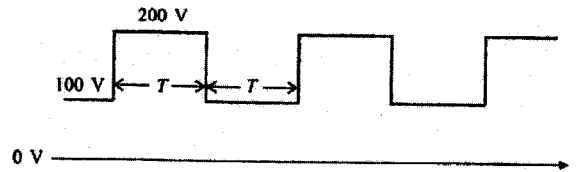
150pF, What is (a) the attenuation of the probe, (b) the value of C for the best performance, and

(c) the input impedance of the compensated probe?



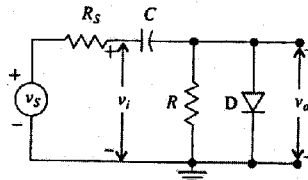
OR

2(a) The square wave shown in figure below is fed to an RC coupling network. Compute and plot the output waveform if RC is very large, say, $RC=10T$. (08)



(b) Give the definition of attenuator. Also explain what is meant by perfect compensation, over compensation and under compensation. (07)

3(a) In the circuit shown in figure below $R_S = R_f = 50\Omega$, and $C = 2\mu F$. A symmetrical square wave signal of amplitude 20V and frequency 5KHz is applied at $t = 0$. Draw first three cycles of the output waveform. (07)

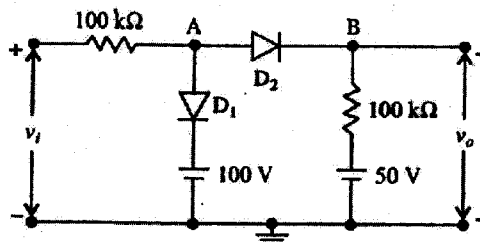


(b) With the help of neat circuit diagram explain the working of two-level diode clipper. (08)

OR

(a) State and prove the clamping circuit theorem. (07)

(b) The input voltage v_i to the two-level clipper circuit shown in figure below varies linearly from 0 to 200v. Sketch the output voltage v_o to the same time scale as the input voltage. Assume ideal diodes. (08)



4 (A) Give the Answers: (10)

1. Loop gain will be _____ if either of the two devices is below cut-off or if either of devices is in saturation.
 2. _____ reduces the output swing.
 3. The Schmitt trigger exhibits hysteresis when loop gain is _____.
 4. The smallest allowable interval between triggers is called the _____ of the flip flop.
 5. A circuit which has got one permanent state and one quasi state is called a _____.
 6. _____ multivibrator has two quasi- stable states.
 7. Synchronization with pulse signals is possible only if _____.
 8. Storing of binary data can be done by _____ multivibrator
 9. A _____ state of a binary is one in which the device can remain permanently.
 10. If the commutating capacitors are too small, the _____ time is increased
- (b) State the advantages and disadvantages of a direct- connected binary. (5)
- (c) what is mean by multivibrator? Describe a different types of multivibrator in short. (5)

5 (a) Explain a working of a collector coupled monostable multivibrator with the use of necessary waveforms and derivations. (7)

(b) Design an astable multivibrator to generate a square wave of 1 KHz with duty cycle of 25%. Using a transistor of $h_{FE} = 25$, $I_{c(sat)} = 5 \text{ mA}$ and $V_{CC} = 12\text{V}$. (8)

OR

(a) Deduce the expression for the frequency of oscillation of an astable multivibrator. (7)

(b) The fixed bias bistable multivibrator uses n-p-n transistors with $h_{FE} = 20$. The circuit parameters are $V_{CC} = 12\text{V}$, $V_{BB} = 3\text{V}$, $R_C = 1 \text{ K}\Omega$, $R_1 = 5 \text{ K}\Omega$, $R_2 = 10 \text{ K}\Omega$, $V_{ce(sat)} = 0.4\text{V}$ and $V_{be(sat)} = 0.8 \text{ V}$. Find the stable state voltages and currents. (8)

6 Write a short note: (any three) (15)

1. Application of Schmitt trigger
2. RC- controlled astable blocking oscillator to obtain frequency division
3. Commutating capacitors.
4. Method of improving resolution
5. Loading and elimination of it