Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (ECE)   (Sem.–5)
PULSE, DIGITAL AND SWITCHING CIRCUIT
Subject Code : EC-309
Paper ID : [A0315]

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. **Write briefly :**
    (a) What do you mean by compensated attenuator?
    (b) How does transistor act as switch?
    (c) Why are ringing circuits used? Discuss.
    (d) Write and discuss any factor which contributes to the delay time in a transistor.
    (e) How gain and Bandwidth of wide-band amplifiers are considered?
    (f) Draw the exponential sweep circuit.
    (g) What is pick-off diode?
    (h) Why is non-saturating bistable multivibrators used?
    (i) Draw transistor based circuit diagram of Schmitt trigger,
   (j) Draw the circuit for op-amp astable multivibrators.

SECTION-B

2. Draw and explain the circuit of transistor clipper with the help of waveforms.

3. What do you understand by switching times of junction diode? With the help of diagram, explain the following terms:

    (a) Storage and transition time

    (b) Diode reverse recovery time

    (c) Diode forward recovery time

4. Plot the frequency response of an RC coupled Transistorized amplifier and derive a relation for current gain under short conditions.

5. With the help of circuit diagram and waveform, explain the operation of collector coupled transistor bistable multivibrators.

6. Which is the necessary condition for RC linear circuit to act as differentiator? State the criteria for good differentiator in terms of steady state analysis for sinusoidal input signal.

SECTION-C

7. An unsymmetrical square wave with $T_1 = 1$ m sec and $T_2 = 1$ μ sec has an amplitude of 10 V. This signal is applied to the restorer circuit of Fig. 1 (as shown below), in which $R_f = 50\Omega$, R = 50 K Ω and $R_s. = 0$. Assume that the capacitor C is arbitrarily large, so that the output is a square wave without tilt. Find where, on the waveform, the zero level is located. (b) If the waveform is inverted so that $T_1 = 1$ μ sec and $T_2 = 1$ m sec, find the location of the zero level, (c) If the diode is inverted, but the input is as in part b, locate the zero level.
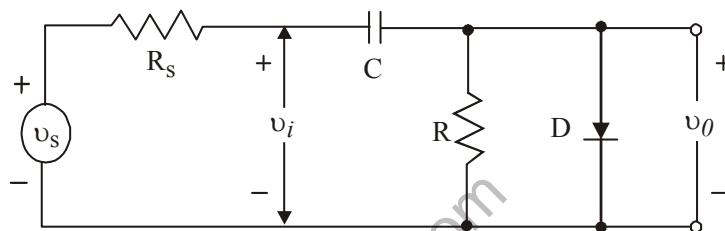
Fig. 1

8. What is compensation? What is the requirement of compensation in wide band amplifier? Discuss shunt compensation and low frequency compensation.

9. State and prove clamping circuit theorem.