Roll No. □□□□□□□□□□□□□

Total No. of Questions : 09

Total No. of Pages : 02

B.Tech.(ECE / ETE) (2011 Onwards)   (Sem.–4)
# PULSE WAVE SHAPING AND SWITCHING
Subject Code : BTEC-405

Paper ID : [A1193]

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) Write briefly effect of temperature on diode.

b) Mention the names and compare active and passive circuit elements.

c) What do you understand by positive feedback? Where is it useful?

d) Give technique to improve the switching speed BJT transistor.

e) Draw circuit diagram of 5 volt clamper?

f) Draw the output wave form of High pass filter for the input of sinusoidal output.

g) Define the condition for High Pass Filter to act as good differentiator.

h) Distinguish monostable and bistable multivibrator.

i) Sketch the ringing circuit.

j) Give a shortcoming of operating a transistor in saturation region.

SECTION-B

2)   Define various input signals

i)   Sinusoidal

ii) Exponential

iii) Ramp

iv) Unit Step.

How does a nonlinear circuit behave for each of them?

3) Explain the working of Transistor Switch with Inductive Load.

4) Prove that Gate width (T) of a Collector Coupled Monostable multivibrator is $T = \tau \ln 2$. Symbols have usual meaning.

5) Explain the working of Operational amplifier based comparator.

6) Draw and explain the working of double differentiator circuit. Find its output, in case of exponentially rising input.

SECTION-C

7) a) Define and explain triggering and its types used in multivibrators. 5

b) Refer to **Figure 1**, A collector coupled one shot using p-n-p germanium transistors has the following parameters : $V_{cc} = -3V$, $V_{BB} = 9V$, $R = 2.7K$, $R_c = 270\Omega$, $R_1 = 1K$, $R_2 = 15K$, $h_{FE} = 25$, $C = 0.01\mu F$. Neglect saturation junction voltages and r_{bb}. Calculate and plot to scale the waveshapes at each base and collector. 5
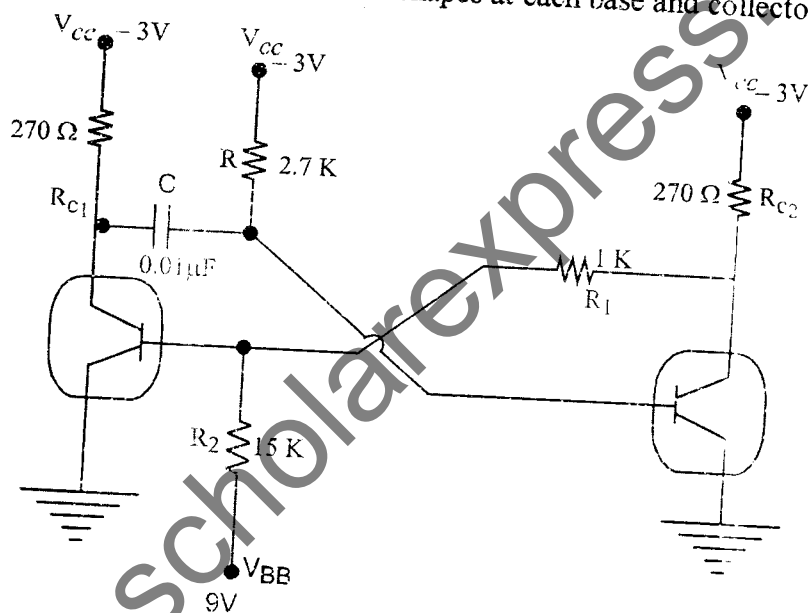

Figure 1

8) a) Calculate the RMS and Average value of a sinusoidal waveform over a half cycle.

b) Explain the working and applications of Schmidt trigger circuit. 5

9) Write short note on the following :

a) Clamping circuit theorem

b) Applications of Voltage Comparator 3

c) Various times concerned with transistor switching. 3

4