Code: 13A04401 **R13**

B.Tech II Year II Semester (R13) Supplementary Examinations May/June 2017

PULSE & DIGITAL CIRCUITS

(Common to ECE and EIE)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) Sketch the waveforms of input and output when symmetrical square wave is applied to ideal integrator.
(b) Give reasons why inductor is rarely used in large time constant applications.
(c) State two applications of voltage comparators.
(d) Draw the clamping circuit which can clamp negative peaks of input signal to above time axis.
(e) State two applications of bi stable multivibrator.
(f) 'Astable multivibrator can be used as square wave generator', justify your answer.
(g) State any two methods of generating time base waveform.
(h) State the factors influencing stability of relaxation dividers.
(i) 'Logic gates are non-linear', justify your answer.
(j) Define gain of sampling gate.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 (a) Discuss the response of High pass RC circuit with the help of waveforms: (i) Step Input. (ii) Ramp input.
(b) Explain how Low pass RC circuit will act as Integrator.

OR

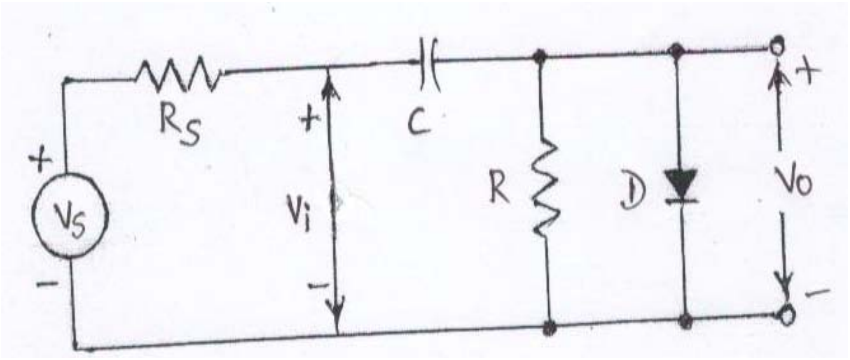
3 (a) Discuss the response of Low pass RC circuit with the help of waveforms: (i) Step Input. (ii) Ramp input.
(b) Explain how High pass RC circuit will act as Differentiator.

UNIT – II

4 (a) State and prove clamping circuit theorem
(b) Draw a ideal clamping circuits for which output to satisfy following conditions:
(i) Positive peaks to be at zero level.
(ii) Negative peaks to be at zero level Assume sinusoidal input.

OR

5 For the clamping circuit shown below, a symmetrical square wave is applied at t = 0 with amplitude ranging from 0 to 10 volts and frequency of 5 kHz. Compute and sketch the output waveform for first several cycles. Given values are $R_s = R_f = 100$ ohms, R = 10 ohms and C = 1 uF.



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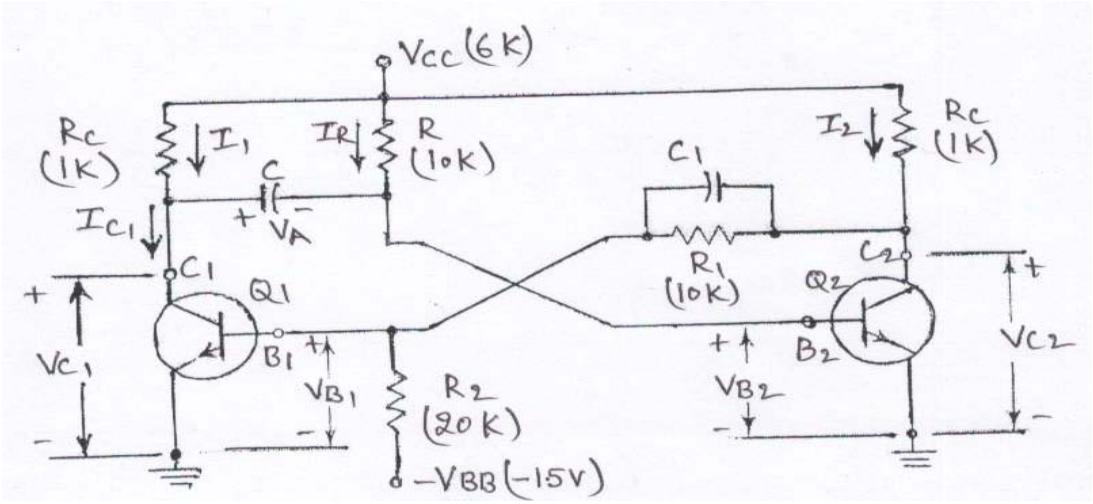
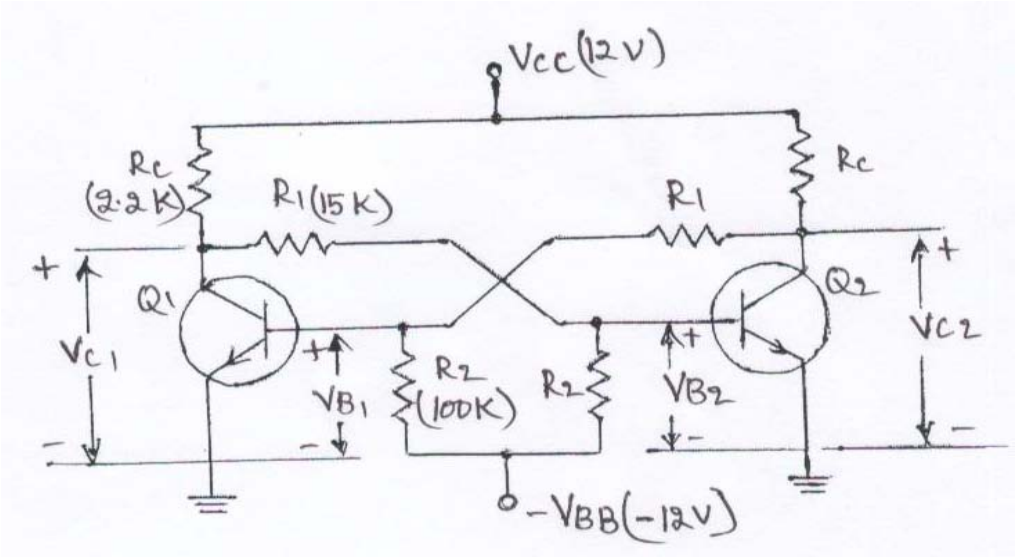
UNIT – III

6 Compute the voltage levels of collector coupled monostable multivibrator at bases and collectors for the circuit shown below.



OR

7 Calculate the stable state currents and voltages for the bistable multivibrator circuit shown below. Assume that the transistors have a minimum h_{FE} value of 20.



UNIT – IV

8 Explain the Millar sweep circuit. Also derive expressions for slope error and sweep speed.

OR

9 With the help of block diagram and necessary waveforms, explain about stability of relaxation dividers.

UNIT – V

10 Explain the bidirectional sampling gate using diodes. Derive the expression for gain.

OR

11 Draw the circuits for OR gate using diodes for negative logic & positive logic and explain the operation.

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