Code No: 124DN

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, May - 2017
PULSE AND DIGITAL CIRCUITS
(Common to ECE, ETM)

Time: 3 Hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

1.a) Obtain the response of high pass RC circuit for a ramp input. [2]
 b) Define % tilt of RC circuit. [3]
 c) Write the applications of voltage comparator. [2]
 d) Draw Negative biased Negative clipper circuit. [3]
 e) Draw the piecewise linear diode characteristics. [2]
 f) When transistor acts as a switch? [3]
 g) Define multivibrator. [2]
 h) Compare different multivibrators. [3]
 i) Explain the frequency division in the sweep circuit. [2]
 j) Define positive and negative logic systems. [3]

PART-B

(50 Marks)

2. Draw the output of the low pass RC circuit for different time constant to:
   a) Pulse input   b) Step input. [10]

OR

3.a) Derive the expression for percentage tilt for a square wave output of RC high pass circuit.
 b) A symmetrical square wave whose peak to peak amplitude is 2μ and whose average value in zero is applied to an RC integrator circuit. The time constant is equal to half the period of square wave, find the peak to peak value of output amplitude. [6+4]

4.a) Draw the circuit diagram of a DC restorer circuit with and without reference voltage and explain its operation for a sinusoidal input signal.
 b) Explain the operation of the following double diode clipper and sketch the output wave form for a sinusoidal input shown in figure. [5+5]
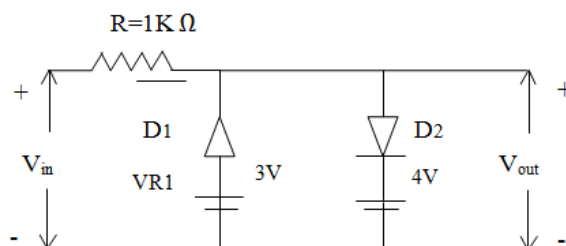
OR

5.a) State and prove clamping circuit theorem.
 b) Explain negative peak clipper with and without reference voltage. [5+5]

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6.a) Explain the operation of linear bidirectional sampling gate using transistor.
 b) Explain in detail the junction diode switching times. [6+4]

OR

7.a) Explain with relevant diagram the various transistor switching times.
 b) For a CE circuit V_{CC} = 10V, R_C= 1K Ω IB =0.2A. Determine
  i) The value of $h_{fe(min)}$ for saturation to occur.
  ii) If R_C is change to 220Ω, will the transistor be saturated? [5+5]

8.a) Draw the circuit of a self biased transistor binary and develop the design and steps of analysis.
 b) For a mono stable vibrator calculate the input pulse width for the design values of R_C = 2k Ω R_B = 10K Ω C = 0.1 μ F, V_{CC} = 10V and V_{BE}(Sat) = 0.8V. [5+5]

OR

9. Draw and explain the working principle of astable multivibrator circuit and also explain the merits and limitations of it. And also derive the expression for its pulse width. [10]

10. Discuss in detail the sine wave frequency division with a sweep circuit. [10]

OR

11. Draw and explain 2-input NAND gate with functional table. [10]

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