

R13

Code No: 114DN

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B.Tech II Year II Semester Examinations, October/November - 2016****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) What do you mean by linear network? [2]
- b) Why RC circuits are commonly used compared to RL circuits. [3]
- c) Distinguish between comparators and clipping circuits. [2]
- d) What do you mean by double ended clipper? [3]
- e) How does diode acts as a switch? [2]
- f) What do you mean by turn ON time of a transistor? [3]
- g) What are the applications of Schmitt trigger? [2]
- h) What are the applications of time-base generators? [3]
- i) What do you mean by synchronization? [2]
- j) Name the technologies which use bipolar transistors. [3]

PART - B**(50 Marks)**

- 2.a) Prove that for any periodic input waveform the average level of the steady state output signal from the RC high pass circuit is always zero.
- b) Derive an expression for the rise time of the output of a low pass RC circuit excited by a step input. [5+5]

OR

- 3.a) Prove that a low pass RC circuit with a large time constant acts as an integrator.
- b) Derive the expression for percentage tilt of a square wave output of RC high pass circuit. [5+5]

- 4.a) Draw the basic circuit diagram of negative peak clamper circuit and explain its operation.
- b) With help of a neat circuit diagram explain the working of a two – level diode clipper. [5+5]

OR

- 5.a) State and prove clamping circuit theorem.
- b) Write short notes on transistor clippers. [5+5]

- 6.a) Explain the operation of transistor switch in saturation.
b) For a common emitter amplifier, $V_{cc} = 15V$, $R_c = 1.5k\Omega$ and $I_B = 0.3 \text{ mA}$. Determine the value of $h_{FE(min)}$ for saturation to occur, if R_c is changed to 500Ω will the transistor be saturated. [5+5]

OR

- 7.a) With the help of a neat circuit diagram and waveforms, explain the operation of Four diode sampling gate.
b) With the help of a neat circuit diagram and waveforms, explain the operation of Six diode sampling gate. [5+5]

- 8.a) Explain the operation of fixed-bias binary with a triggering circuit and waveforms.
b) Design a Schmitt trigger circuit to have $UTP=6V$ and $LTP=3V$ using silicon Transistor Whose $h_{FE(min)}=40$. Assume necessary data. [5+5]

OR

- 9.a) Draw the circuit diagram of Bootstrap time base generator and explain its operation with necessary waveforms.
b) Compare the voltage and current time base generators with some examples. [5+5]

- 10.a) Illustrate the terms synchronization and frequency division of a sweep generator.
b) With the help of neat waveforms explain sine wave frequency division with a sweep circuit. [5+5]

OR

- 11.a) With a neat circuit diagram explain the operation of a TTL tristate output.
b) With the help of neat circuit diagram and truth table explain
(i) RTL OR gate
(ii) RTL AND gate. [5+5]