Code No: 114DN **R13**

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 = 1.5kΩ and I_B = 0.3 mA. Determine the value of $h_{FE(min)}$ for saturation to occur, if R_c is changed to 500 Ω 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]

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