

Code No: 54021

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year II Semester Examinations, May - 2016

PULSE AND DIGITAL CIRCUITS

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions

All questions carry equal marks

- 1.a) Derive an expression for the rise time of the output of a low-pass circuit excited by a step input.
b) Derive an expression for the output of a high-pass circuit excited by a square input.
c) Why RC circuits are commonly used compared to RL circuits? [5+5+5]
- 2.a) Draw the basic circuit diagram of negative peak clamper circuit and explain its operation.
b) What are the clipping circuits? And explain about the shunt clippers in detail.
c) What is meant by comparator and explain diode differentiator comparator. [5+5+5]
- 3.a) Write a short note on switching times of a transistor.
b) Draw and Explain the piece-wise linear characteristics of a diode.
c) Discuss the breakdown voltage considerations and saturation parameters of transistor. [5+5+5]
- 4.a) Design a Schmitt trigger circuit NPN silicon transistors to meet the following specifications. $V_{cc} = 10V$, $U_{TP} = 3.5V$, $L_{TP} = 1.7 V$, $h_{fe} = 50$, $I_{C2} = 3 \mu A$. Use relevant assumptions and the empirical relationships.
b) Explain with the help of a neat circuit diagram the principle of operation of a monostable multivibrator, and derive an expression for pulse width. [8+7]
- 5.a) With the help of a neat circuit diagram and waveforms, explain the working of a transistor bootstrap time base generator.
b) Derive the relation between various errors of sweep circuits. [8+7]
- 6.a) What is pedestal? What are the effects of it in sampling gates?
b) With help of a neat diagram, explain the working of bidirectional gates using transistors. [8+7]
- 7.a) With the help of neat waveforms, explain frequency division with a sweep circuit.
b) Explain the principle of synchronization in sweep circuits and describe how frequency division synchronization is done in Astable relaxation circuits with help of neat diagram. [7+8]
- 8.a) Why a OR gate is called mixing circuit? Draw a diode OR circuit for positive logic and explain how it works.
b) Why totem pole is used in DTL? Draw the circuit diagram and explain a DTL gate with this. [7+8]