



R20 Regulation

Subject code: 3P4DC

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech IV Semester Regular/Supplementary Examinations, September 2023

PULSE AND DIGITAL CIRCUITS
(ECE)

Maximum Marks: 70

Date: 19.09.2023 Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 Define the rise time.
- 2 Define percentage tilt of RC circuit.
- 3 Differentiate between clamping and clipping circuits.
- 4 Draw the circuit for Clamper taking source into account.
- 5 What do you mean by turn ON time of a transistor?
- 6 Draw the piecewise linear diode characteristics
- 7 Explain the working principle of astable multivibrator.
- 8 Compare different multivibrators.
- 9 Mention the technologies that are used in bipolar transistors
- 10 Give the applications of sampling gates

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 Prove that an RC low pass circuit behaves as a good integrator if $RC > 15T$ where T is the Period of the input sinusoid $E_m \sin \omega t$. (10M)
- OR
- 12 A. Discuss about RL Low pass circuit and RL High pass circuit. (5M)
B. Derive the expression for rise time of the output of a low pass circuit excited by a step input and obtain relation between rise time and bandwidth. (5M)
- 13 With the help of neat circuit diagram, explain the working of two level diode clipper. (10M)
- OR
- 14 With the help of neat circuit diagram and waveforms explain the working of positive & negative clamping circuit. (10M)
- 15 A. For a common emitter amplifier, $V_{cc} = 15V$, $R_c = 1.5k\Omega$ and $I_B = 0.3 \text{ mA}$. Determine the value of $h_{FE}(\text{min})$ for saturation to occur, if R_c is changed to 500Ω will the transistor be saturated. (5M)
B. Explain with neat sketches the working of transistor Bootstrap timebase generators. (5M)

- OR
- 16 A. Draw the switching characteristics of a transistor and define all switching times. (5M)
B. Explain the effect of temperature on transistor characteristics. (5M)
- 17 Explain the operation of a mono-stable multivibrator with triggering circuits and waveforms and derive an expression for its pulse width. (10M)
- OR
- 18 Discuss the operation of collector coupled astable multivibrator with its output waveforms. (5M)
- 19 A. Describe the working of TTL NAND gate with a neat diagram. (5M)
B. Compare different Logic families. (5M)
- OR
- 20 Describe the working of a 4-Diode sampling gate with necessary diagram & equations. (10M)