



**Regulation R18**

**TKR COLLEGE OF ENGINEERING AND TECHNOLOGY**

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

**Subject code: 2P3DE**

**B.Tech. III Semester Regular/Supplementary Examinations, February 2021**

**PULSE AND DIGITAL CIRCUITS**

**(Electronics and Communication Engineering)**

**Maximum Marks: 70**

**Date: 26.02.2021 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.
  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 and write the expression of it.
- 2 Explain the condition when RC high pass circuit works as a differentiator?
- 3 What is difference between linear and non-linear wave shaping circuits?
- 4 What are the applications of voltage comparators.
- 5 What are the important parameters to be observed when the transistor is operated as electronic switch?
- 6 What are the methods of Generating Time Base Waveforms
- 7 Draw and explain the fixed bias transistor bistable multivibrator
- 8 What is the difference between Symmetrical and Unsymmetrical Triggering.
- 9 Compare unidirectional and bi-directional Sampling Gates
- 10 How do sampling gates differ from logic gates?

**Part-B**

**Answer All the following questions.**

**(10M X 5=50Marks)**

- 11 a) Draw the RC Low pass circuit. With necessary waveforms and expressions explain its working for step input. 5M  
b) In an RC low pass circuit  $R = 1\text{K}\Omega$  and  $C = 1\mu\text{F}$ . A square wave with half period of  $10\mu\text{sec}$  is applied as input to this circuit. Determine the output waveforms. 5M

**OR**

- 12 What is attenuator? Draw the circuit of compensated attenuator and show that condition for compensation is  $R_1C_1 = R_2C_2$ . 10M
- 13 a) Explain the working of a two-level diode clipper with the help of circuit diagram, waveform and transfer characteristics. 5M  
b) Draw the circuit diagram of a Transistor clipping circuit. Explain its operation with its transfer characteristic and necessary expressions. 5M

**OR**

- 14 State and prove the clamping circuit theorem 10M
- 15 Explain in detail the junction diode switching times. 10M

OR

- 16 Draw the circuit diagram of Transistor Miller Time Base Generator and explain its operation in detail. 10M
- 17 With the help of a neat diagram and waveforms, explain the principle of operation of bi-stable multivibrator. 10M

OR

- 18 a) Explain the working of Schmitt trigger with the help of a neat circuit diagram. 5M
- b) Design a collector-coupled monostable multivibrator using an n-p-n silicon transistor with  $h_{FE}(\min) = 40$ ,  $V_{BE}(\text{cut off}) = 0 \text{ V}$  and  $I_B(\text{sat}) = 1.5 I_B(\min)$ . Given that:  $V_{CC} = 10 \text{ V}$ ,  $I_C(\text{sat}) = 5 \text{ mA}$ ,  $R_{C1} = R_{C2} = R_C$ ,  $V_{CE}(\text{sat}) = 0.2 \text{ V}$  and  $V_{BE}(\text{sat}) = 0.7 \text{ V}$ . If the pulse width required is  $1 \text{ ms}$ , calculate the value of  $C$ . 5M
- 19 Draw and explain the unidirectional diode sampling gate for more than one input signal and also explain how to overcome the loading effect on control signal? 10M

OR

- 20 a) List out the few comparisons of DTL, TTL and CML logic families. 5M
- b) Realize NAND and NOR gates using CMOS logic and explain their operation with the help of truth tables. 5M