



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 bistablemultivibrator
- 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  $R=1K\Omega$  and  $C=1\mu F$ . A square wave with half period of  $10\mu sec$  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 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