

# DIGITAL ELECTRONICS

Modern Digital Electronics by RP Jain (3<sup>rd</sup> Edition)

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## Previous Year's Questions Analysis

Topics	Chapter
1. Fan Out (4.2.4), Noise Margin	
2. 3-input DTL NAND Gate (4.6.1, Fig: 4.12)	
3. Fan-out of an RTL Logic Circuit (4.3.2)	
4. $V(0)$ and $V(1)$ for TTL Logic Gate with Totem-pull up (4.8.2)	
5. Advantage of $I^2T$ Logic and Design it for functions..... (4.5, 4.5.2)	4
6. ECL OR-NOT Gate Explain with Circuit with Diagram (4.11, Fig: 4.18)	
9. Bipolar and Unipolar (4.1.1, 4.1.2)	
10. Characteristics of Digital IC to Compare the performances (4.2)	
11. Current Source Logic (4.3.5) , Current Sinking Logic	
12. Practice to Implement functions using diode logic gates.	
13. Example: 4.1, 4.2***	
14. Disadvantages of DCTL (4.4)	
1. SR Flip Flop, JK Flip Flop, T Flip Flop, D Flip Flop	
2. Problem with SR Flip Flop when $S = R = 1$ and how to solve it	
3. JK using NAND Gate. What is Race Around Condition and how to eliminate? (Fig: 7.9, 7.4.1)	7 & 8
4. Classify Register. Design a 5 bit Serial Input Serial Output (SISO) Register and Input "11111" (8.2, 8.2.1, Fig: 8.2, 8.3 (Serial Input))	
5. Design SR flip flop with preset and clear option and explain. (7.3.1)	
6. 3-bit Binary Up-Down Ripple Counter	
1. PLD and PLA with Their Application and Advantages/ Disadvantages (12.1)	12
2. Implement $x = A'B + C'D' + E$ using PLA	

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1. Define Multi-vibrator and Duty Circle (9.1, page: 347 )
2. Draw a Schmitt Trigger and draw the output waveform of input voltage of  $10 \sin(\omega t)$ . (9.3.2, Example: 9.3)
3. Astable multi-vibrator using op-amp of frequency 0.5Hz.
4. Explain Different types of multi-vibrator briefly with necessary waveforms. (9.1)
5. A 555 timer is connected as an astable multi-vibrator having  $R_a = 1k\Omega$ ,  $R_b = 1k\Omega$ ,  $C = 10\mu F$ . Draw the circuit and determine the frequency and duty circle of output signal. (9.3.3)
6. Design a mono-stable multi-vibrator using 555 timer for  $T = 100 \text{ ms}$  (9.6.1, Fig: 9.35)
7. Frictional Block of 555 Timer (Fig 9.33)
8. Problems : 9.1
9. A 555 timer is connected as an astable multi-vibrator having an output frequency of 10KHz with a duty circle of 75%. Design the circuit diagram and determine the charging and discharging Time. (9.6.2, Fig: 9.37)
10. Free running multi-vibrator using inverters and explain its output waveform. (9.2.1)
11. For Free-Running multi-vibrator draw the voltage across the capacitor and show that  $T = 2R_f C \ln \left( 1 + \frac{2R_2}{R_1} \right)$  (9.3.3)
12. Find Out the Duty Circle of Astable Multi-vibrator Using IC 555 (9.6.2)

9

1. Design a 4-bit Weighted-resister D/A converter. Determine output voltage for straight binary input '1101' (Mixed of 10.2.1 and Example: 10.2 (b))

2. 10.2.1

10

3. Example: 10.2

4. 10.2.2