## Question Bank Integrated Circuits

1. Explain the working of CMOS inverter with proper diagrams.

2. Realize the 2 input NAND and NOR gate using CMOS and explain which realization is better.

3. Explain the working of S-R latch.

4. Sketch and explain the Complementary implementation of S-R Flip Flop using NOR gates.

5. Sketch and explain the Complementary implementation of S-R Flip Flop using NAND gates.

6. Sketch the logic gate symbolic representation of an SR flip flop using NAND gates. Give the truth table and describe the operation. Also sketch a CMOS circuit implementation.

7. Sketch and explain the clocked SR flip-flop using NAND gates. Also sketch a CMOS implementation.

8. Realize the following equation with CMOS:

a) Y = (AB+CD)'

b) Y = (AB+C(D+E))'

9. Realize the XOR gate using CMOS and also give the truth table and explain the operation.

10. Realize a Simpler CMOS Implementation of Clocked SR Flip Flop. Also explain the working of the circuit.

11. Realize the D Flip-Flop using CMOS.

12. Explain the working of basic Log Amplifier. Also derive the expression for Vout.

13. Explain the working of basic Anti Log Amplifier. Also derive the expression for Vout.

14. Explain the working of temperature compensated Log Amplifier using diode. Also derive the expression for Vout.

15. Explain the working of temperature compensated Anti Log Amplifier. Also derive the expression for Vout.

16. Explain the working of temperature compensated Log Amplifier using transistor. Also derive the expression for Vout.

17. Explain the Precision Half Wave and Full Wave Rectifiers with proper circuit diagram. Also explain the concept of super diode.

18. Write a short note on the following:

a) Peak detector

b) Sample and Hold Circuit

19. Explain Op-amp as Comparator and Zero crossing detector with suitable diagram and waveform.

20. Explain Schmitt Trigger with proper diagram and also explain the different circuit configuration for Schmitt Trigger. Also find the expression for hysteresis.

21. For Non Inverting Schmitt Trigger, Calculate 1) Lower Threshold Voltage, 2) Upper

Threshold Voltage, 3) Hysteresis if saturation voltage are + 12 V and - 12 V.

22. For Inverting Schmitt Trigger, Calculate 1) Lower Threshold Voltage, 2) Upper Threshold

Voltage, 3) Hysteresis if saturation voltage are + 15 V and - 15 V.

23. For Inverting Schmitt Trigger, Calculate the value of R1 and R2 if saturation voltage are + 12 V and - 12 V. Assume hysteresis width = 6 V

24. Explain Astable multivibrator with suitable diagram, also find out the expression for time period and frequency of oscillation.

25. For Astable multivibrator if R2= 100k, R1= 86k, saturation voltage are + 15 V and - 15 V
Calculate 1) Lower Threshold Voltage, 2) Upper Threshold Voltage, 3) Frequency of oscillation.
26. Explain Monostable multivibrator with suitable diagram. Also find the expression for time period and frequency of oscillation.

27. Explain the concept of triangular wave generation and also find the expression for time period and frequency of the triangular wave.

28. Explain the IC 555. Design Astable multivibrator using IC-555 and also find the expression for time period and frequency of oscillation.

29. Explain the IC 555. Design Monostable multivibrator using IC-555 and also find the expression for time period and frequency of oscillation.

30. Explain the Block Diagram of PLL IC, Also explain the working of PLL and its application.