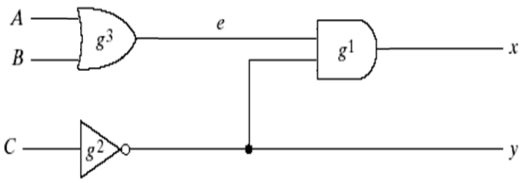
Unit2 – Logic Family

Pat B (4 Marks)

1. What do you mean by logic level? Explain the positive logic and negative logic systems?
2. Mention the important characteristics of digital ICs
3. Show the truth table of negative logic NAND gate
4. Show the truth table of negative logic NOR gate
5. Give the comparison of TTL & CMOS gates
6. Explain the action of TTL NOT gate.
7. Compare: RTL and TTL.
8. Compare totem pole and open collector outputs.
9. Explain the operation of open collector TTL.
10. Write short a note on types of TTL configurations.
11. What is the major difference between ECL and TTL?
12. Utilize diode and transistor to realize the NAND gate
13. Define fan-in and fan-out
14. Determine the High state Noise Margin of a standard TTL gate having the following currents as follows: V_{OH}=2.4 V,V_{IH}=2 V,V_{OL}=0.4 V,V_{IL}=0.8 V,
15. State the advantage and disadvantage of ECL family.
16. What is meant by 'speed power product' in IC digital logic families? . Is lower value of speed power product desirable? Justify
17. Show the propagation delay for full adder circuit
18. Explain tri state logic
19. Draw and briefly explain the output characteristics of MOSFET.
20. Draw the NAND gate circuit and its truth table, using CMOS logic.
21. Write short notes on PMOS device.
22. State the advantage and disadvantage of CMOS family.
23. Explain the diode logic configuration
24. Give the syntax for VHDL architecture declaration.
25. Write the HDL program for the given circuit



26. What are the main components of a VHDL description?
27. Show the block diagram of FPGA
28. Draw the configuration logic block in FPGA.

Part –C (12 Marks)

1. Define logic family. List the various characteristics of logic family
2. Illustrate in detail about the Digital IC specifications of digital logic families with relevant diagrams.
3. Explain the diode transistor logic
4. Explain IIL logic family and show the merits and demerits.
5. Explain NOR and OR gate construction using ECL. Also give the characteristics of ECL family.
6. Write short notes on following: a) RTL (b) DTL (c) TTL
7. Design an open collector TTL NAND gate logic.
8. With circuit schematic, explain the operation of a two port TTL NAND gate with totem-pole output.
9. With a neat sketch, describe in detail about the TTL Gate with Totem-Pole Output and Open-collector TTL acting as NAND Gate.
10. With neat sketch explain the circuit diagram of CMOS NOR gate.
11. With neat sketch explain the circuit diagram of CMOS NAND gate
12. Explain the characteristics and implementation of the following digital logic families. (a) CMOS (b) ECL
13. Explain the operation of enhancement type MOSFET with suitable diagram and draw its characteristics
14. Explain in detail the working of N channel depletion MOSFET with transfer and drain characteristics.
15. With neat sketch explain the operation of MOS family.
16. Design a CMOS inverter and explain its operation. Comment on its characteristics