ज्ञानेन प्रकाशते जगत्
INDUS UNIVERSITY

Digital Electronics

Unit 3 Combinational Logic design

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1. Explain Half adder& full adder with truth table & logic diagram and kmap.
2. Explain half subtractor and full subtractor with truth table & logic diagram and kmap.
3. Explain 4 bit parallel binary subtractor in detail.
4. Explain 4 bit binary adder -subtractor .
5. Explain 4 bit parallel binary adder in detail.**OR** Design the 4-bit parallel adder.
6. Explain 2 bit magnitude comparator in detail.
7. Explain following Encoder with logic diagram and truth table .
   Octal to binary Encoder
   Decimal to BCD Encoder
8. Explain following Decoder with logic diagram and truth table.
   3 to 8 line decoder
   2 to 4 line decoder
   BCD to seven segment decoder
9. Explain following Multiplexer with logic diagram and truth table.
   2*1 Multiplxer
   4*1 Multiplexer
   8*1 Multiplexer
10. Explain following Demultiplexer with logic diagram and truth table.
    1 to 4 line demultiplexer
    1 to 8 line demultiplexer
11. Design full adder circuit with multiplexer
12. Usa a multiplexer have three data select input to implement the logic for the function given below. Also realize the same using 16:1 MUX
    F= ∑m (0,1,2,3,4,10,11,14,15)
13. Use 4*1 Mux to implement the logic function
    F = ∑m (1,2,4,7)
14. Use 8*1 Mux to implement the logic function
    F = ∑m (1,3,4,11,12,13,14,15)
15. Design 16:1 MUX using 4:1 Mux modules
16. Design 32:1 Mux using two 16:1 MUX and one 2:1 mux modules
17. Design 8 to 1 Multiplexer using 2 to 1 multiplexer.

18. Design a 4 bit binary to gray code converter **OR** Design a combinational circuit that takes 4-bit binary number and produces Gray code of the input.
19. Design a 4 bit gray to binary code converter.
20. Design a SOP circuit to detect decimal numbers 5 through 12 in a 4 bit gray code input.
21. Design a combinational circuit to produce the 2's Complement of a 4 bit binary number
22. Design a circuit to detect decimal numbers 0,1,4,6,7 and 8 in a 4 bit XS-3 code input.
23. Design a logic circuit with 4 inputs A,B,C,D That Will Produce Output '1' only whenever two adjacent input variables are 1s.
24. Design a even parity bit generator for 4 bit input.
25. Design a odd parity bit generator for 4 bit input.