



Candidates are required to answer all the questions in their own words as far as practicable.

Group "A"

Attempt any TWO Questions.

[2*10=20]

1.
 - a) Implement Full adder circuit using decoder with truth table and logic diagram. [5]
 - b) Implement 4*16 decoder using 2*4 decoder. [5]
2.
 - a) List the applications of Multiplexer. Design 8*1 MUX using 4*1 MUX. [1+4]
 - b) Implement the given function with a multiplexer. $F(A,B,C,D) = \sum(0, 1, 3, 4, 8, 9, 15)$. [5]
3. What are weighted and non-weighted codes? Using truth table and K-MAPs, construct circuit diagram for BCD-to-excess3 code converter. [2+8]

Group "B"

Attempt any EIGHT Questions.

4. State De Morgan's Law. Expand it for 3 variables and prove using the truth table. [2+1+2]
5. Implement 2 input XOR and XNOR gate using NAND and NOR gate respectively. [5]
6. Simplify the Boolean function $F(w, x, y, z) = \sum(1, 3, 7, 11, 15) + D(0, 2, 5)$. Implement the minimized expression using NAND only. [5]
7. Perform subtraction from $(1111)_2$ to $(1010)_2$ using r^s and $(r-1)^s$ complement method. [5]
8. What is meant by canonical form? Express the Boolean Function $F = A + \bar{B}C$ in a sum of minterms. [5]
9. Design a combinational circuit for 3 bit magnitude comparator and explain it. [5]
10. What do you mean by encoder? Design octal to binary encoder. [5]
11. What is meant by DEMUX? Implement full Subtractor using 1:8 DEMUX. [1+4]
12. **Write short notes on:**
a) Digital System b) POS c) Duality theorem [5]