

Question Bank (G scheme)

Name of subject: Principles of Digital Techniques

Subject code: 17320

Unit Test: I

Semester: 3G

Course: EJ/IS/IE

CHAPTER1: NUMBER SYSTEM (12 marks)

3 marks

- 1) Convert the following number to Decimal
 - a) $(110101)_2$
 - b) $(A4)_{16}$
- 2) Convert the following number in to Binary
 - a) $(736)_8$
 - b) $(2F9)_{16}$

4 marks

- 3) Convert the following number in to octal
 - a) $(247)_{10}$
 - b) $(A72)_{16}$
- 4) Convert the following number in to Hexadecimal
 - a) $(123)_8$
 - b) $(95)_{10}$
- 5) Perform the subtraction using $(45)_{10} - (47)_{10}$ using
 - a) 1's Complement method
 - b) 2's Complement method
- 6) Perform the following
 - a) $1001 * 1101$
 - b) $1001 / 0011$

Codes:

- 7) Add $(569)_{10}$ & $(687)_{10}$ in BCD
- 8) Convert the following in to BCD & subtract them using 9's & 10's compliment
 $(637)_{10} - (142)_{10}$
- 9) Convert (any one)
 - a) $(274.6)_{10}$ in to Gray code & XS-3 code.
 - b) $(10110.101)_2$ in to Gray code & XS-3 code.
- 10) Convert Binary to BCD $(110101)_2$ & $(101101)_2$ and add them .
- 11) State the rules for BCD Addition.

CHAPTER 2: LOGIC GATES AND INTRODUCTION TO LOGIC FAMILIES

(16 marks)

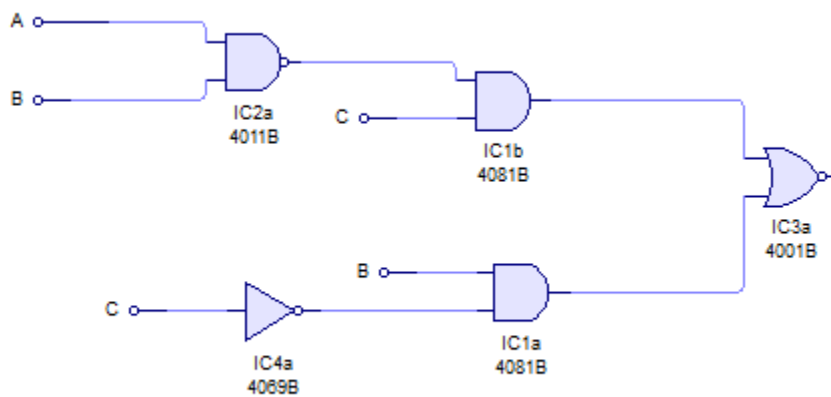
3 marks

- 12) Draw symbol & Truth Table for 2 inputs NOR gate.
- 13) Explain positive & negative logic in TTL.

4 marks

- 14) State & Prove DE Morgan's Theorem.
- 15) With sketch realize the expression $Y = (A+B)(B+C)$ using
 - a) NAND gate only.
 - b) NOR gate only
- 16) Identify the IC'S & Draw their PIN configuration.
 - a) IC 7486
 - b) IC 7402
 - c) IC 7432
 - d) IC 7408

17)



For the above diagram derive the Boolean Expression of Y. Simplify the equation and draw logic diagram using NAND GATE.

- 18) Construct the following Logic Gates (any one)
 - a) AND gate & EXOR gate using NOR gate
 - b) NOR gate & AND gate using NAND gate
- 19) Give any four characteristics of CMOS, TTL & ECL logic families. (Any 2)

CHAPTER 3: COMBINATIONAL LOGIC CIRCUITS (08 marks)

3 marks

20) Minimize the following SOP expression (ANY ONE)

a) $Y = \sum m(0, 3, 5, 6, 9, 10, 12, 15)$

b) $Y = \sum m(0, 1, 2, 3, 11, 12, 14, 15)$

c) $Y = \sum m(1, 5, 6, 7, 11, 12, 13, 15)$

4 marks

21) Convert POS in to Canonical POS format (ANY ONE)

a) $Y = (A + B)(A + C)$

b) $Y = (\bar{A} + B)(B + \bar{C})(\bar{A} + \bar{C})$

c) $Y = (A + B)(A + C)(B + \bar{C})$

22) Convert SOP into Canonical SOP format (ANY ONE)

a) $Y = AB + A\bar{C} + BC$

b) $Y = (A.\bar{B}) + (\bar{B}.\bar{C})$

c) $Y = A + B$

23) Convert (ANY ONE)

a) SOP into POS $Y = A\bar{C} + AB$

b) POS into SOP $Y = (A + \bar{B})(B + C)$

24) Simplify following (ANY ONE)

a) $Y = \sum m(1, 3, 7, 11, 15) + d(0, 2, 5)$

b) $Y = \sum m(1, 4, 8, 12, 13, 15) + d(3, 14)$

25) Give the expression of the following using K-MAP & draw logic diagram.

a) FULL ADDER