8. (a) Write the truth table, equation and logic diagram and explain decimal to BCD Encoder. (10)

(b) (i) Write any Five applications of Multiplexers. (5)

(ii) Write any FIVE applications of Encoders. (5)

SECTION – V

9. a) Write the logic diagram, truth table, logic expressions and gate-level circuit for decimal to BCD encoder. (10)

b) Show how BCD-to-7-segment decoder can be interfaced to 7-segment display. (7)

c)Write a note on priority encoder (3)

10. a) Compare the features of TTL with CMOS family. (5)

b) List the advantages and disadvantages of ICs (5)

c) Explain the classification of ICs based scale of integration (5)

d) Define fan-in, fan-out, propagation delay, power dissipation and speed-power product as applicable to ICs (5)

SECTION – II

3. A) Explain following gates with symbol, expression and truth table. **(10)**

AND, OR NOR, NAND, EXOR.

B) Simplify the following logic expression using Boolean algebra. Draw the logic diagram. **(10)**

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

ii) $Y = ABCD + AB\overline{CD} + \bar{A}\bar{B}CD$.

4. A) Show the realization of all logic gates using NOR gate. **(10)**

B) i) What is SOP and POS with examples. **(5)**

ii) Illustrate POS to SOP conversion $F(A, B, C) = \pi(2, 3, 5)$. **(5)**

SECTION – III

5.(a) Analyze the working of 3-bit parallel adder. **(10)**

5.(b) Explain the working of full-Subtractor using truth-table , boolean expression and logic diagram. **(10)**

OR

6.(a) Design 2-bit magnitude comparator using logic gates. **(10)**

6.(b) (i) Compare serial and parallel adder. **(5)**

6.(b) (ii) List the various multiplexer ICs and their functions. **(5)**

SECTION – IV

7. (a) (i) Realize basic gates using 2:1 Mux. **(6)**

(ii) Realize 4:1 Mux using 2:1 Mux **(4)**

(b) (i) What are Demultiplexers? Write the truth table, equation and logic diagram of 2:1 MUX. **(10)**

Register Number : 457EC21008

Makeup Examination Nov/Dec - 2022

I Semester Diploma Examination

DIGITAL ELECTRONICS (20EC11T)

[Max. Marks: 100

Time: 3 Hours]

Instruction: i) Answer ONE full question from each section.

ii) One full question carries 20 marks.

SECTION – I

1. (a) Perform following operations: **(10)**

(i) $255.625_{(10)} =$ _____$_{(2)}$

(ii) $10100101_{(2)} =$ .....$_{(16)}$

(iii) $BDA_{(16)} =$ .....$_{(10)}$

(iv) $101011_{(2)} =$ .....$_{(8)}$

(v) 2's compliment of 1100110 = _____

(b) (i) Realize the Gray code to binary converter using logic gates. **(4)**

(ii) Explain the AND Gate and NAND gate with logic symbol, Truth table and Boolean expressions. **(6)**

2. (a) Perform following operations: **(10)**

(i) Subtract $00111_{(2)}$ from $10101_{(2)}$ using 2's compliment method.

(ii) Multiply $1011_{(2)}$ with $0111_{(2)}$

(iii) Add $1234_{(16)}$ and $ABCDE_{(16)}$

(iv) Perform BCD addition on two BCD numbers $1001_{(2)}$ and $0011_{(2)}$

(v) The excess-3 code of $1010_{(2)}$ =_____.

(b) (i) Explain ASCII codes. Give an example. **(5)**

(ii) Apply Boolean algebra to find the expression for Y. **(5)**