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Total No. of Questions : 07] [Total No. of Pages : 02

Paper ID [B0209]

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BCA (Sem. - 2nd)

DIGITAL CIRCUITS AND LOGIC DESIGN (BC - 205)

Time : 03 Hours **Maximum Marks : 60**

Instruction to Candidates:

1) Section - A is **Compulsory**.
2) Attempt any **Four** questions from Section - B.

Section - A

Q1) *(10 x 2 = 20)*

a) What is the largest decimal number that can be represented by 16 bit binary word?

b) What are the applications of binary number system?

c) Convert the decimal number 39.75 to octal.

d) How can you use NAND gate as inverter?

e) Construct the truth table for $F = xy + \bar{x}\,\bar{y}$.

f) What are maxterms?

g) What is the difference between combinational and sequential circuits?

h) What is a D-flip flop?

i) What is priority encoder?

j) Add a parity bit to make odd parity in the binary word 11001101.

Section - B

(4 x 10 = 40)

Q2) (a) Implement XOR gate using only NAND gates. What are its applications?
(b) What are weighted codes? Give examples.

Q3) (a) Simplify the expression $F=\overline{A}B(B+C)+BC(\overline{A}+\overline{B})$.
(b) State the De-Morgan's theorems. Draw the truth tables and equivalent logic circuits.

Q4) (a) Convert the given expression in canonical SOP form $Y=AC+AB+BC$.
(b) Simplify the function using Karnaugh map and implement using minimum number of logic gates. $F=\sum m(0,2,4,7,8,13,14)$

Q5) (a) Draw the logic diagram of full adder. Discuss its working.
(b) What is the difference between a decoder and a demultiplexer? Draw the logic diagram of 1 to 8 decoder.

Q6) (a) What is the difference between level and edge triggering? Explain the working of master slave J-K flip flop.
(b) Explain the basic principle of shift register. Describe the operation of parallel shift register.

Q7) (a) Differentiate between synchronous and asynchronous counters.
(b) What is the limitation of parity method for error detection? Describe the Hamming code for error detection and correction.