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Total No. of Pages: 01
Total No. of Questions: 07

BCA (Sem.-3rd)
DIGITAL CIRCUITS AND LOGIC DESIGN
Subject Code: BSBC-303
Paper ID: [B0230]

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATE:

- 1. Section-A is compulsory.*
- 2. Section-B attempt any four questions.*

SECTION-A

(10x2=20)

Q. 1.

- (a) Which gates are called Universal gates and why?
- (b) Add -29 and 12 using 2's complement.
- (c) Write a note on half adders.
- (d) State the De-Morgan's theorem.
- (e) Write a note on master slave J-K Flip Flops.
- (f) What is a race condition? How can it be removed?
- (g) Differentiate between synchronous and asynchronous counters.
- (h) How many flip flops are required to construct a binary-n Modulo Counter.
- (i) What will be the binary representation of number $(1999)_{10}$.
- (j) What will be the reduced expression for function $BC+AC'+AB+BCD$.

SECTION-B

((4x10=40)

Q. 2. Write a note on the following:

- (a) XNOR and NAND gates
- (b) State the applications of logic gates

Q. 3. Simplify the Boolean Function F with don't care condition in sum of products form

$$F(w, x, y, z) = \sum(0, 1, 2, 3, 7, 8, 10)$$

$$D(w, x, y, z) = \sum(5, 6, 11, 15)$$

Q. 4. What are multiplexers and implement the Boolean Function $F(A, B, C) = \sum(1, 3, 5, 6)$ using 4x1 multiplexer.

Q. 5. What are sequential Circuits? State the advantage of synchronous sequential circuits over asynchronous sequential circuit and Discuss the R-S flip flop and T Flip Flops.

Q. 6. What are counters? Illustrate the design of synchronous counters.

Q. 7. Write a note on

- (a) Encoders
- (b) Up down counters

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