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**Paper ID [A0210]**

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**BCA-205 (OLD/S05) (Sem. - 2<sup>nd</sup>)****DIGITAL CIRCUITS & LOGIC DESIGN****Time : 03 Hours****Maximum Marks : 75****Instruction to Candidates:**

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

**Section - A***(15 × 2 = 30)***Q1)**

- a) Convert 40 from decimal to octal number.
- b) Convert DF from hex to decimal number.
- c) What are Minterms and Maxterms?
- d) What is a combinational circuit?
- e) What is a half-adder?
- f) What is a flip-flop?
- g) What is an asynchronous input?
- h) What is a shift register?
- i) Subtract 101 from 1011 using 2's complement.
- j) Subtract 1101 from 1111 using 1's complement.
- k) What is an error correcting code?
- l) What is an encoder?
- m) What are universal gate?
- n) What is a T flip-flop?
- o) What is positive logic?

**Section - B****(9 × 5 =45)**

- Q2)** Enumerate the features of Hamming code.
- Q3)** Explain SOP and POS functions with examples.
- Q4)** Using De- Morgan's Laws, convert the NAND function  $Y = (AB)'$  into NOR function.
- Q5)** Explain the essential features of the Karnaugh map. What are their advantages and disadvantages?
- Q6)** Discuss the features of the Quine-McCluskey method.
- Q7)** What is a multiplexer? Construct a 64-to-1 multiplexer using 4\*1 MUX.
- Q8)** Draw an S-R flip-flop using NOR gates and develop its truth table.
- Q9)** Compare between synchronous and asynchronous counters.
- Q10)** What is the race-around problem, and how is it rectified?
- Q11)** Discuss the various types of shift registers and their applications.
- Q12)** Discuss the Master Slave J-K flip flop with the help of suitable block diagram.
- Q13)** What is an updown counter? Design an updown counter which counts from 0 to 9.

