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Name.....

Reg. No.....

**THIRD SEMESTER (CBCSS-UG) DEGREE EXAMINATION, NOVEMBER 2024**

Information Technology

BIT 3C 06—FUNDAMENTALS OF DIGITAL ELECTRONICS

(2019—2023 Admissions)

Time : Two Hours

Maximum Marks : 60

**Section A (Short Answer Type Questions)**

*All questions can be answered.  
Each question carries 2 marks.  
(Ceiling 20 marks)*

1.  $(ABC5)_{16} = (\dots)_{10}$ .
2. Using 2's complement perform  $10101 - 10111$ .
3. Simplify the expression  $XY + XYZ + XYZ + XYZ.T$ .
4. Convert  $(A + B)(C + B)$  into Canonical expression.
5. State De Morgan's theorem.
6. What is BCD number ?
7. What is Gray Code ?
8. Hexa decimal equivalent of  $11001010$ .
9. What is a decoder ?
10. Explain T flip-flop.
11. What is DRAM ?
12. Explain octal to hexadecimal conversion with example.

**Section B**

*All questions can be answered.  
Each question carries 5 marks.  
(Ceiling 30 marks)*

13. Discuss the basic law of Boolean algebra.
14. Define JK flip-flop.
15. Differentiate between Synchronous and Asynchronous counters.

**Turn over**

16. Explain multiplexers.
17. What are universal gates ? Explain.
18. Simplify the following switching functions using Boolean Algebra :
  - (a)  $A + AB + BCD + BBD$ .
  - (b)  $ABC + (B + C)(B + D) + A + C + D$ .
19. What is A/D converter ?

### Section C

*Answer any **one** questions.*

*The question carries 10 marks.*

20. Using K-map simplify the following function and implement using NAND gates only  
 $f(A, B, C, D) = \Sigma(0, 2, 4, 8, 11, 14) + X(1, 3, 10, 15)$ .
21. What is a Hamming code ? How is it generated ? Discuss on its error detection and correction capabilities.

(1 × 10 = 10 marks)