



C09-EC-305

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**BOARD DIPLOMA EXAMINATION, (C-09)
MARCH/APRIL—2018
DECE—THIRD SEMESTER EXAMINATION**

DIGITAL ELECTRONICS

Time : 3 hours]

[Total Marks : 80

PART—A

3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Define de Morgan's theorems with example.
2. Perform the following conversions :
 - (a) $(CB4.C8)_{16}$ to decimal number system
 - (b) $(1101100101)_2$ to its gray code equivalent
3. Realise the basic gates using NAND gates only.
4. Distinguish between serial adder and parallel adder.
5. What is the need for tri-state buffer? Give its symbolic representation.
6. Explain the need of preset and clear inputs in flip-flops.

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7. What is ^{*} race around condition? How can it be avoided?
8. List any two IC numbers of flip-flops, registers and counters.
9. Classify various types of memories.
10. Define the terms :
- (a) Resolution
- (b) Monotonicity
- (c) Settling time

PART—B

10×5=50

Instructions : (1) Answer *any five* questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. (a) Draw and explain TTL NAND gate with totem-pole output. 7
 (b) Explain the importance of parity bit. 3
12. (a) Compare TTL, ECL and CMOS logic families. 6
 (b) What are min terms and max terms? Explain their significance. 4
13. Draw and explain a 4-bit parallel adder using full adders with suitable example.
14. (a) Draw and explain the operation of 1×4 demultiplexer. 6
 (b) Construct a full adder using NAND gates only. 4
15. Draw the logic and timing diagram of *J-K* master-slave flip-flop and explain its working.

16. Draw and explain the working 74194 universal shift register and its importance.
17. Explain analog to digital conversion using successive approximation method with a neat diagram.
18. (a) What is NVRAM? Draw the block diagram of NVRAM. Explain its operation. 6
- (b) List the applications of digital to analog converters. 4
