C09–EC–**305**

# 3237

## 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.

**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

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**PART—B**                                    10×5=50

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***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

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