

Code : 9EC-02E

Register
Number

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I Semester Diploma Examination, November 2011

E & C BOARD

DIGITAL ELECTRONICS

Hours |

[Max. Marks : 100

- Instructions : (1) Section – A is compulsory.
(2) Answer any two full questions from each of the remaining Sections – B, C & D.

SECTION – A

- (a) Fill in the blanks with appropriate answer : 5 × 1 = 5
- (i) The number that come immediately after $(FFEF)_{16}$ is _____.
 - (ii) A logic gate which outputs a high only when the two inputs are different is _____.
 - (iii) A high when logically ANDed with a high results in _____.
 - (iv) Combinational logic circuit does not have _____ capability.
 - (v) Number of Flip Flops required for Mod-13 counter are _____.
- (b) Compare TTL logic family with CMOS. 5

SECTION – B

2. (a) Convert $(11001.0101)_2$ to decimal. 4
(b) Explain the concept of 2's complement for a decimal number. 5
(c) Explain the 2-input exclusive or gate with truth table. 6
3. (a) Find out the octal equivalent of $(2F.C4)_{16}$, and 8AB. 4
(b) Implement NOT and or gate using universal (NAND) gate. 5
(c) Perform the following operations. 6
- (i) Multiply 11.110 and 100.1
 - (ii) Subtract 1011 from 1100 using 2's complement
 - (iii) BCD equivalent of 83.

4. (a) Mention the steps involved in Binary to Gray code conversion with an example.
- (b) List & explain any 3 laws of Boolean Algebra.
- (c) Define Fan-Out, Propagation delay.

SECTION - C

5. (a) Define a combination circuit.
 - (b) Explain an half adder circuit with truth table.
 - (c) Design a two bit magnitude comparator with its relevant Boolean expression.
6. (a) Define a multiplexer. Explain the gate level circuit operation of a 2 : 1 multiplexer.
 - (b) What is an encoder ? And define priority encoder.
 - (c) Compare & contrast sequential logic & combinational logic circuit.
7. (a) Explain the operation of a BCD to Decimal Decoders with truth table.
 - (b) Explain the working of Binary Decimal Encoder.
 - (c) Compare serial adder with parallel adder.

SECTION - D

8. (a) Mention some of the applications of flip flops.
 - (b) Define :
 - (i) Propagation delay in ripple counter.
 - (ii) Modulus of a counter.
 - (c) Explain a 4-bit SISO shift register using flip-flop with its timing diagram & truth table.
9. (a) Mention the differences between synchronous & asynchronous counter.
 - (b) What is shaft register ? List some of it's applications.
 - (c) Explain the operation of a decade counter with the truth table.
10. (a) List out the applications of counters.
 - (b) Explain the operation of Mod-5 counter with timing diagram.
 - (c) Draw the gate level circuit of J.K. flip-flop with preset & clear inputs & explain its operation with the help of truth table.