

**RAJ KUMAR GOEL INSTITUTE OF TECHNOLOGY & MANAGEMENT, GZB**  
**1st Sessional Examination 2017-18 ( Odd Semester)**

**Roll No.:**  
**Year/Branch: 2/ EC**  
**Max Time: 1Hours 30 Minute**

**Subject Name: DLD**  
**Subject Code: REC 301**  
**Max Marks: 50**

**SECTION-A**

**Q.1 Attempt all parts carry equal marks. Write answer of each part in short. (2x5=10)**

- a) What are the advantages of Gray code over straight binary number.
- b) Draw the logic diagram of half subtractor.
- c) Find 2's complement of +16 and -16.
- d) Design a Full Adder using two Half Adders.
- e) Draw the X-OR gate with 4 NAND gate.

**SECTION-B**

**Note: Attempt any five questions from this section. (5x5=25)**

- Q.2 Obtain simplified expression  $F(w,x,y,z) = \sum(0,1,2,3,4,5)+d(10,11,12,13,14,15)$  and implement by NAND gates only if un-complemented inputs are available.
- Q.3 Draw a 4 bit adder & Subtractor circuit.
- Q.4 Design a 4 bit priority encoder. Specify the purpose of "valid bit" indicator in priority encoder.
- Q.5 Design a combinational circuit that generates 9's complement of BCD numbers.
- Q.6 Perform BCD subtraction using 9's complement (a) 258.9-476.7 (b) 357-198.
- Q.7 Draw the logic diagram of 2 to 4 decoder using NAND gates only.
- Q.8 Design a combinational circuit that convert a BCD code into Xs-3 code.
- Q.9 Prepare a Hamming code for the "0100 1001 010" assuming even parity.

**SECTION-C**

**Note: Attempt any two questions from this section. (7.5x2=15)**

- Q.10 Find Prime Implicants and Essential Prime Implicants (EPI) by Quine-McClusky method of  $F = \sum(5,7,8,9,10,11,14,15)$ .
- Q.11 Design a 4-bit look ahead carry generator.
- Q.12 Design a full subtractor circuit with 3 inputs x,y and  $B_{in}$  and two outputs D &  $B_{out}$ . The circuit subtracts  $x-y-B_{in}$ , Where  $B_{in}$  indicates input borrow,  $B_{out}$  Output borrow and D is difference.