

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-III • EXAMINATION – WINTER • 2014

Subject Code: 2131704

Date: 20-12-2014

Subject Name: Digital Logic Circuits

Time: 02.30 pm - 05.00 pm

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Design a 3 bit combinational circuit for converting binary code to gray code **07**
(b) Do as directed:
1. Convert $(B65F)_{16}$ to decimal **01**
2. Find the tens complement of $(52520)_{10}$ **02**
3. Write the reflected code for 3 bits **02**
4. Subtract $(3250-72532)_{10}$ using 10s compliment **02**
- Q.2** (a) Simplify 1. $A'B + A'BC' + A'BCD + A'BC'D'E$ **07**
2. $(P+Q+R)(P' + Q' + R')P$
(b) 1. State and prove demorgan's theorem **07**
2. Define: a) Positive and negative logic b) Propagation delay c) Fan-out
OR
(b) Simplify the following Boolean function using K-map **07**
1. $F = x'yz + xy'z + xyz + xyz'$
2. $F = A'C + A'B + AB'C + BC$
- Q.3** (a) Simplify the Boolean function using K-map in 1) Sum of product **07**
2) product of sum (d is don't care condition)
 $F = A'B'D' + A'CD + A'BC$ d = $A'BC'D + ACD + AB'D'$
(b) Simplify the Boolean function using the tabulation method **07**
 $F(A,B,C,D,E,F,G) = \sum(20,28,38,39,52,60,102,103,127)$
OR
- Q.3** (a) What is encoder? With logic circuit and truth table explain the working of Octal to binary encoder. **07**
(b) Design a combinational circuit for full adder and full subtractor **07**
- Q.4** (a) Design a 3-bit binary counter using T flip-flop **07**
(b) Write short note any two flip-flops of your choice (include circuit diagram, characteristic table, characteristic equation and symbol) **07**
OR
- Q.4** (a) Write a note on binary ripple counter **07**
(b) List the characteristics of digital logic families. Define any two characteristics. **07**
- Q.5** (a) Explain arithmetic, logic and shift micro operations **07**
(b) Explain R-2R ladder type DAC **07**
OR
- Q.5** (a) Explain Successive Approximation ADC **07**
(b) Design a circuit for a 4 bit BCD adder **07**
