

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV (NEW) EXAMINATION – WINTER 2018****Subject Code:2140910****Date:28/11/2018****Subject Name:Digital Electronics****Time: 02:30 PM TO 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.

MARKS

- Q.1**
- (a) Convert $(0.6875)_{10}$ to binary equivalent number **03**
 - (b) Using 10's complement, subtract (i) $(72532-3250)_{10}$ **04**
(ii) $(3250-72532)_{10}$
 - (c) State and Prove De-Morgan's theorems with necessary truth table. **07**
- Q.2**
- (a) Prove that a positive-logic AND gate is a negative-logic OR gate. **03**
 - (b) Why NAND gate and NOR gate are known as universal gates? **04**
Obtain Ex-OR and Ex-NOR using NAND.
 - (c) Write short note on error detection codes. **07**
- OR**
- Q.3**
- (c) Write short note on Gray code. **07**
 - (a) Reduce the expression $f = (B+BC)(B+\bar{B}C)(B+D)$ **03**
 - (b) Define the following general characteristics of logic families. (i) Propagation delay time (ii) Noise Margin (iii) Fan – out **04**
(iv) Power dissipation
 - (c) Minimize the following Boolean expression using K- Map and realize it using logic gates. **07**
 $F(A,B,C,D) = \sum m(0,1,5,9,13,14,15) + d(3,4,7,10,11)$
- OR**
- Q.3**
- (a) Compare K-map and tabular method of minimization. **03**
 - (b) Compare Counters and Registers. **04**
 - (c) Express the Boolean function $F = A + \bar{A}C$ in a sum of min-terms. **07**
- Q.4**
- (a) Distinguish between combinational and sequential logic circuits. **03**
 - (b) Explain full-subtractor in brief. **04**
 - (c) Write short note on Multiplexers. **07**
- OR**
- Q.4**
- (a) State the basic difference between synchronous and asynchronous counters. **03**
 - (b) Explain operation of 4 bit left shift register with necessary diagrams. **04**
 - (c) Differentiate between level triggering and edge triggering of flip-flops. Explain Master-Slave J-K flip-flop configuration. **07**
- Q.5**
- (a) Define following specification of ADC (i) Resolution (ii) Conversion time (iii) Quantization error **03**
 - (b) Compare between various types of ROM. **04**
 - (c) Explain internal organization of RAM, Draw and explain with necessary block diagram the process of writing in memory and reading from memory also. **07**

OR

- Q.5 (a) Define following specifications of DAC (i) Resolution (ii) Accuracy (iii) Settling time (iv) Monotonicity. **03**
- (b) Compare various D/A Converters. **04**
- (c) Describe operation of D/A converter with binary weighted resistors. **07**

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