

GUJARAT TECHNOLOGICAL UNIVERSITY**MCA. Sem-I Remedial Examination April 2010****Subject code: 610004****Subject Name: Fundamentals of Computer Organization****Date: 07 / 04 / 2010****Time: 12.00 noon – 02.30 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** Write the following: **14**
- [a] Convert the hexadecimal number 657 to binary and octal number.
- [b] Perform the arithmetic operations (+32) - (-13) in binary using signed-2's complement.
- [c] Represent decimal number 3256 in BCD and excess-3 gray code.
- [d] Prove by perfect induction $A + \overline{AB} = A + B$
- [e] List X-OR gate applications.
- [f] Perform the subtraction with unsigned decimal numbers by taking the 10's complement: 8567 - 2451
- [g] Detect and correct errors in the even parity hamming code word 001001001010
- Q.2** [a] Explain the concept of Master Slave Flip-Flop with Diagram. **07**
- [b] Reduce following expression using K-map and write SOP and POS form of Reduced expression. Draw circuit using Universal Gate. **07**
- $f = \sum m(0, 2, 8, 9, 10, 11) + d(1, 3)$
- OR**
- [b] Write short note on universal gates with circuit and truth table. **07**
- Q.3** [a] Explain Up-Down counters with example. **07**
- [b] Explain BCD counter with example. **07**
- OR**
- Q.3** [a] Explain 4-bit shift register with example. **07**
- [b] Design a counter, using three JK flip-flops X, Y, and Z, which counts as 0, 7, 3, 2, 5, repeat **07**
- Q.4** [a] Explain BCD adder with example. **07**
- [b] Explain how to divide 14 by 4 in the registers and showing how the quotient and remainder are placed after the division. (all are 5 bit registers) **07**
- OR**
- Q.4** [a] Draw circuit of parallel addition and subtraction. Explain circuit by adds and subtracts +7 and -4. **07**
- [b] Explain how to multiply 7*9 in the registers. (all are 5 bit registers) **07**
- Q.5** Explain the following:
- [a] Write short note on addressing modes. **03**
- [b] Write short note on DMA. **03**
- [c] Explain Cache Memory and Virtual Memory. **03**
- [d] Explain different types of ROMs. **02**
- [e] Explain Octal-to-Binary encoder. **03**
- OR**
- Q.5** Explain the following:
- [a] Write short note on instruction formats **03**
- [b] Write short note on modes of Transfer. **03**
- [c] Explain Random Access Memory. **02**
- [d] Write short note on peripheral devices. **03**
- [e] Explain 3-to-8 decoder. **03**
