

**GUJARAT TECHNOLOGICAL UNIVERSITY****MCA SEM-I Examination- Jan.-2012****Subject code: 610004****Date: 05/01/2012****Subject Name: Fundamentals of Computer Organization (FCO)****Time: 10.30 am-1.00 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) i.) Subtract 25 from 14 using 2's complement arithmetic. **04**  
 ii.) Convert  $(247.68)_{10}$  into Binary, Octal and Hexadecimal. **03**
- (b) Perform  $13 * 5$  and show the contents of the registers in each step. **07**
- Q.2** (a) What is a flip-flop? Explain RS Master Slave flip-flop. **07**
- (b) i.) Reduce  $\overline{A}BC + B + B\overline{D} + A\overline{B}\overline{D} + \overline{A}C$  Using Boolean laws and implement them using logic gates. **04**  
 ii.) Why 8 bit is equal to 1 byte? Comment. **03**
- OR**
- (b) i.) What is cyclic code? Convert  $(AF)_{16}$  into GRAY code. **03**  
 ii.) Explain 7 bit Hamming code for error correction. Encode 0011 into 7-bit even-parity Hamming code. **04**
- Q.3** (a) Design a JK counter which will count the sequence 2,4,5,7 and repeat. **07**  
 (b) Reduce the expression  $\sum m(1, 5, 6, 12, 13, 14) + d(2, 4)$  to the simplest possible POS form and implement them using universal logic. **07**
- OR**
- Q.3** (a) Design a RS counter which will count the sequence 3,4,6,7 and repeat. **07**  
 (b) Make a K-map of the following expression and obtain the minimal SOP form. Implement them using universal logic. **07**
- $$AB + A\overline{C} + C + AD + \overline{A}BC + ABC$$
- Q.4** (a) What is instruction format? Explain different types of instruction format. **07**  
 (b) Write short note on Printer **07**
- OR**
- Q.4** (a) What are various modes of data transfer? Explain DMA in detail. **07**  
 (b) Explain different addressing modes? Which one is best. **07**
- Q.5** (a) What is a Multiplexer? Explain 4-to-1 line multiplexer. **07**  
 (b) Explain RAM and types of RAM? Which one do you select & why? **07**
- OR**
- Q.5** (a) What is a Decoder? Explain 2-to-4 line Decoder using NAND gates. **07**  
 (b) Explain ROM and types of ROM? Explain their applications **07**

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