

PGDCA / MCA (I Year) / BCA

Term-End Examination

June, 2008

CS-01 : COMPUTER FUNDAMENTALS

Time : 3 hours

Maximum Marks : 75

Note : Question number 1 is **compulsory**. Answer any **three** questions from the rest.

1. (a) Perform following subtraction using 2's complement : 4

(i) $1101100 - 1011001$

(ii) $1100011 - 1100101$

- (b) Differentiate between direct and indirect address instruction. How many memory references are required for each type of instruction to bring an operand into a processor register ? Explain. 5

- (c) Write an 8086 assembly language program to convert a two-digit BCD number passed in Accumulator (AX) to its binary equivalent. 8

- (d) Simplify the following expression using K-maps in sum of product form :

$$F(w, x, y, z) = \Pi(5, 10, 12, 13, 14)$$

Also, draw the logic circuit for the simplified expression. 6

- (e) Convert $(3333)_4$ to hexadecimal number. 2
- (f) Draw the logic diagram of 4-bit even parity checker.
Explain its operation with the help of truth table. 5
2. (a) How is a RISC processor better than a CISC processor ? Justify your answer. 4
- (b) What is the difference between control flow and data flow computers ? 3
- (c) What is the purpose of making data flow graph ?
Make data flow graph for
$$U = (A * (A + B) - (A + B) / B)$$
 6
- (d) Give two differences between decoder and demultiplexer. 2
3. (a) An 8-bit register R1 contains 10101010. What should the value of the register R2 be such that the most significant 4-bits of R1 are 6
- (i) selectively cleared
- (ii) selectively set
- (iii) masked
- (iv) selectively complemented ?
- Show the resulting operations.
- (b) List four subcycles of an instruction cycle. Also list the various micro-operations of these subcycles. 6
- (c) Compare Static RAM with Dynamic RAM. 3
4. (a) Find the length of SEC code and SEC DED code for the following 16 bit data sequence : 7
- 1010 0101 1010 0101

- (b) Draw the diagram and explain the working of a JK master slave flip-flop. How does its working differ from simple JK flip-flop ? 6
- (c) How is an index register related to the auto-increment mode of addressing ? 2
- 5. (a) Why does DMA have priority over the CPU when both request a memory transfer ? 3
- (b) Make the logic diagram of a 4-bit serial shift register using JK flip-flops. Show the steps to shift the binary number 1101, through this register. 7
- (c) Give an example of the addition of two floating point operands using an arithmetic pipeline. Show all the steps involved. 5