

## PGDCA / MCA (I Year) / BCA

## Term-End Examination

June, 2007

## CS-01 (S) : COMPUTER FUNDAMENTALS

Time : 3 hours

Maximum Marks : 75

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

1. (a) Simplify the following expression using Karnaugh's map in product of sum form :  

$$F(A, B, C, D) = \Sigma(1, 2, 3, 8, 9, 10, 11, 14)$$
 Also, draw the logic circuit for the simplified expression. 6
- (b) Perform following subtraction using 1's complement : 4
- (i)  $11001 - 10110$
- (ii)  $11011 - 11001$
- (c) Write an assembly language (8086) program to convert a 4-digit decimal number to its binary equivalent. 8
- (d) Find the decimal equivalent of hexadecimal number 2BA5. 2

- (e) What is decoder ? Differentiate between decoder and demultiplexer. 3
- (f) Draw and compare the central and distributed bus arbitration schemes. 7
2. (a) What is an addressing mode ? Explain various addressing modes of 8086 with example for each. 10
- (b) Draw the logic diagram of 4-bit odd parity checker. Explain its operation with the help of truth table. 5
3. (a) Explain with the help of a diagram how the CPU executes an instruction in a computer system. 5
- (b) What is the role of a stack in handling the interrupts ? What is the difference between the stack and normal read/write memory ? 5
- (c) Draw the logic diagram of 3-bit synchronous counter using JK flip-flop. Also, explain its working. 5
4. (a) Write a program in assembly language (8086) that calculates the sum of  
 $1^2 + 2^2 + 3^2 \dots N^2$   
 and store the sum of the above series in a user defined data item. 8
- (b) What are the benefits of instruction pipelining ? Explain its working procedure. Also, discuss the pipeline performance measures. 7

5. (a) Convert the following program statement to parallel statements : 3
- ```
for i: = 1 to N
    begin
for j: = 1 to N
    begin
    A(i, j): = 50;
    end;
    end;
```
- (b) What are the problems which prevent RISC pipelining to achieve maximum speed ? 3
- (c) Differentiate between control flow and data flow computers. 3
- (d) Draw and explain the working of the architectural configurations of SIMD array processors. 6

