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CS-01

03142

PGDCA/MCA (I Year)/BCA

Term-End Examination

June, 2010

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) Convert the following decimal numbers to binary equivalent : **5**

(i) 39.37

(ii) 206.66

Add the numbers given in (i) and (ii) and convert the result into hexadecimal.

(b) Simplify the following Boolean function using four variable Karnaugh's map in product of sum form : **7**

$$F(A, B, C, D) = \Sigma(0, 1, 3, 5, 7, 11, 15).$$

Also, draw the logic circuit for the simplified expression.

(c) Assume rotational speed of a disk is 3600 rpm, the disk has 125 sectors/track and 512 bytes/sector. What is the data transfer rate and average latency time of the disk system. 5

(d) What makes the cache memory fast ? Explain different types of mapping techniques used in cache memory organisation. 7

(e) Write the contents of the conditional flags of the flag register of the 8086 microprocessor after subtraction of A and B is performed. Assume value of two 8 bit numbers A and B are 11001100 and 00111001 respectively. 6

2. (a) Draw the logic diagram of 3 bit synchronous counter. Also, explain its working. 7

(b) Define the following terms : 5

(i) Instruction Register

(ii) Interrupts

(iii) Interface

(iv) Fetch cycle

(v) Multiplexer

(c) Which of the categories of Flynn's classification suits parallel processing. Explain. 3

3. (a) What are Bit - Slice ALUs ? What is a main advantage of such ALUs. 3

(b) Explain the following Mnemonics of 8086 Instruction set, with an example of each. 12

(i) XLAT

(ii) DAA

(iii) CMPS

(iv) ROL and RCL

4. (a) Explain any four addressing modes with the help of an example each. 4

(b) Explain the functioning of R-S flip-flop. How does J-K flip-flop overcome the problem of RS flip-flop ? 5

(c) Design and Explain an arithmetic pipelining for floating point addition or subtraction. Show with a flow chart. 6

5. (a) Give at least three differences between each of the following : 9

(i) Static dataflow and dynamic dataflow computers.

(ii) Multiprocessors with crossbar switch and Multiprocessors with multipost memory.

(iii) Horizontal micro instructions and Vertical micro instructions.

(b) Explain the problem of cache coherence in multiprocessor system. **3**

(c) How does synchronisation take place in the multiprocessor system ? **3**
