

2004 CENTRE FOR DEVELOPMENT OF ADVANCED COMPUTING(C-DAC) M.C.A

**END-TERM EXAMINATION
SECOND SEMESTER [MCA] –MAY 2004
COMPUTER SYSTEM ARCHITECTURE**

Paper Code: MCA-106

Time: 3 Hours

Marks: 60

Q. 1 A digital system has 16 registers, each with 32 bits. It is necessary to provide parallel data transfer from each register to every other register.

- (a) How many lines are needed for transfer along 4 common bus? 3
- (b) How many lines are needed for direct parallel transfer? 3
- (c) If the registers form a scratch-pad memory, how is information transferred from one register to other? Let the register in the memory be designated as R0 to R15 6

List the sequence of micro operations for a transfer of contents of R6 to R13 .

Q. 2 (a) Construct a 5-to-32-line decoder with four 3-to-8-line decoders with one enable and one 2-to-4-line decoder. 8

(c) Obtain the 10's complement of the following six digit decimal number :
123900, 090 657, 100000, 000000. 4

Q. 3 (a) A sequential circuit has two D flip-flop A and B, two inputs X and Y and one output Z. The flip-flop input equations and the circuit output are as follows :-
 $DA = XY + XA$, $DB = X1B + XA$, $Z=B$

- (i) Draw the logic diagram of the circuit.
- (ii) Tabulate the state table. 8

(b) Discuss race around conditions in J-K flip-flop. 4

Q. 4 (a) Define the following:- 6

- (i) Micro instruction
- (ii) Micro Program
- (iii) Control Memory

(b) Convert the following numerical arithmetic expression into reverse Polish notation and show the stack operation for evaluating the numerical result.

$(3+4) [10(2+6) + 8]$ 6

Q. 5 (a) What is the difference between RISC and CISC processors? 6

(b) Draw the flowchart for multiplying two floating point-numbers. 6
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Note: Attempt any five questions.

Q. 6 Explain the following :- 12

- (a) Vector processor.
- (b) Associative Memories

Q. 7 Explain following: - 12

- (a) Modes of data transfer
- (b) Input/ output processor

Q. 8 Write short notes on any two :- 12

- (a) Cache memory
- (b) Virtual memory
- (c) Memory management hardware

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