

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

MCA (2015 Batch) (Sem.-1)
COMPUTER ORGANIZATION & ASSEMBLY LANGUAGE

Subject Code : MCA-103

Paper ID : [72709]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

- 1. SECTIONS-A, B, C & D contains TWO questions each carrying TEN marks each and students has to attempt any ONE question from each SECTION.**
- 2. SECTION-E is COMPULSORY consisting of TEN questions carrying TWENTY marks in all.**
- 3. Use of non-programmable scientific calculator is allowed.**

SECTION-A

1.
 - a) What are the different formats of various instructions? How is Bus and Memory transfer done in a computer?
 - b) How stack is implemented in a general microprocessor system?
2.
 - a) Briefly discuss the five levels of parallelism used in computer architecture to increase computer system performance.
 - b) Give examples of techniques from each of these levels, each with a brief description. Also give examples from real life where these techniques are used.

SECTION-B

3.
 - a) Suggest a suitable SIMD algorithm to multiply two $(n \times n)$ matrices using $(n \times n \times n)$ number of processors. Assume suitable value of n . Comment on the time complexity of your algorithm.
 - b) What do you mean by optimization of memory hierarchy, explain the addressing schemes for main memory?
4.
 - a) Compare the distributed memory model and the shared memory model for parallel programming in terms of various parameters.
 - b) What is symmetric multiprocessor? Discuss about its advantages.

SECTION-C

5. a) How much memory does the page table, indexed by the virtual page number, take for a system using 32 bit virtual addresses, 4 KB pages, and 4 bytes page table entry? The system has 512 MB of physical memory.
b) Describe the concepts 'page fault' and 'TLB' and how are they related?
6. The parameters of a Computer memory system are specified as follows :
 - a) Main memory size 8k blocks
 - b) Cache memory size 512 blocks
 - c) Block size 8 wordsDetermine the size of tag field of the main memory under the following conditions :
 - a) Fully associative mapping
 - b) Direct mapping
 - c) Set associative mapping with 16 blocks/set

SECTION-D

7. What do you mean by program control instructions? With a neat diagram, explain how the status register containing overflow, zero, sign and carry flags works with the status of the accumulator content obtained from ALU.
8. a) What are the advantages of assembly language? How is it different from high-level language?
b) What is a microprogram sequencer? With block diagram, explain the working of microprogram sequencer.

SECTION-E

9. **Write briefly :**
 1. What is an Instruction Cycle?
 2. What is an auxiliary memory?
 3. What is the difference between serial and parallel processing?
 4. What is the use of DMA?
 5. How many different addressing modes are there?
 6. How many registers are there in 8085 processor?
 7. What is the need of an interrupt?
 8. What is the difference between a software and a hardware interrupt?
 9. What is the acronym for RISC architecture?
 10. What is a cache memory?