

Time: 3 Hours

Max Marks: 80

- N.B: 1) Question no. 1 is compulsory.
2) Attempt any three out of the remaining five questions
3) Use suitable data, wherever necessary.

Q 1: Attempt any four questions from the following:

(20)

- a. Explain the function of given CPU registers used in Von Neumann model:
MAR, MDR, IR, PC, SP
- b. Differentiate between DRAM and SRAM
- c. Why does a superscalar processor use dynamic branch prediction? Justify.
- d. Define Micro-operation, Microinstruction, Micro-program, Micro-code.
- e. In a multiprocessor system, suppose an application runs on a 4-processor machine and 80% of the application is parallelizable, compute the achievable speedup by applying Amdahl's law.

Q 2 (a) Show the multiplication process using Booth's algorithm and multiply the following:

Multiplicand = +23

Multiplier = - 6

(10)

Q2 (b) Explain cache memory mapping techniques with an example

(10)

Q3(a) Demonstrate the advantages of pipelining and explain various types of pipeline hazards and their solutions. Give examples

(10)

Q3(b) Explain in detail hardwired control. Discuss any one method to implement it.

(10)

Q 4(a) Explain page replacement algorithm also find out page faults, page hit, hit ratio for the following string using FIFO and LRU method. Consider page frame size = 3.

2 3 8 9 5 3 8 5 3 3 1 2 4 8 5 4

(10)

Q 4(b) Explain in detail, different types of buses and methods of arbitration.

(10)

Q 5(a) Explain in detail, characteristics of RISC and CISC

(10)

Q 5(b) Explain Flynn's classification for parallel processing systems.

(10)

Q 6. Write short notes on (any four)

(20)

- a. IEEE 754 format
- b. PCI bus Architecture
- c. NUMA
- d. Cluster computing
- e. Control sequence for the execution of SUB R1, (R2) instruction.