

RAM chips of 256×8 and ROM chips of

system needs 2k bytes of RAM. 4k bytes

interface units, each with four registers. A

I/O configuration is used. The two highest-order

bus are assigned 00 for RAM, 01 for ROM, and

interface registers. Draw a memory address map for the

information is inserted into a FIFO buffer at a rate of m bytes per second. The information is deleted at a rate of n bytes per second.

The maximum capacity of the buffer is k bytes. How long does it take for an empty buffer to fill up when $m > n$ and how long does it take for a full buffer to empty when $m < n$?

Q. 6

Give the flow chart for add and subtract operations in signed-magnitude form.

Section - C (Marks : 10 each)

Q. 7 Explain in detail the difference between RISC and CISC Architecture.

Q. 8 (a) What are the limits on how much a processor's performance can be improved using pipelining?

(b) How many bits of storage are required for tag array of 32-KB cache with 256-byte cache lines and four-way-set-associativity if the cache is write-back but does not require any additional bits of data in the tag array to implement the write-back policy? Assume that the system containing the cache uses 32-bit addresses.

Q. 9 (a) Why are benchmark programs used to measure computer performance and also explain why we need multiple benchmarks instead of using only one best benchmark program?

(b) Use IEEE single-precision floating point numbers to compute the following quantities :

$$13.25 + 4.5$$

$$0.125 * 8$$

QUESTION PAPERS

Instruction to Candidates :

Section - A is compulsory.

Attempt any Four questions from Section - B.

Attempt any Two questions from Section - C.

Computer Architecture

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Section - A (Marks : 2 each)

- Q. 1 (a) Convert the following logic function into Σ minterm :
 $A'B'CDE' + A'BCDE + AB'CD'E'' + ABCD'E$.
- (b) Define the terms microprocessor and microcomputer.
- (c) Give the layered view of a computer system.
- (d) What is the role of Registers in digital computers?
- (e) Perform the subtraction with the following unsigned binary number by taking the 2's complement of the subtrahend 100-11000.
- (f) Explain the meaning of the memory-reference instruction LDA.
- (g) What is the difference between micro-operation and microprogram?
- (h) What is the difference between external interrupts and internal interrupts?
- (i) How associative memory is useful in memory hierarchy?
- (j) What do you mean by DMA I/O Concept?

Section - B (Marks : 5 each)

- Q. 2 Explain in brief about SPMD machines.
- Q. 3 Give an overview of 8251 USART.