B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2010
Fourth Semester
Computer Science and Engineering
CS2253 — COMPUTER ORGANIZATION AND ARCHITECTURE
(Common to Information Technology)

(Regulation 2008)
Time: Three hours Maximum: 100 Marks
Answer ALL Questions
PART A — ($10 \times 2 = 20$ Marks)

1. Distinguish between autoincrement and autodecrement addressing mode.
2. Compare RISC with CISC architecture.
3. Under what situations the micro program counter is not incremented after a
new instruction is fetched from micro program memory?
4. What are the relative merits of horizontal and vertical microinstruction
format?
5. What is pipelining and what are the advantages of pipelining?
6. List the key aspects in gaining the performance in pipelined systems.
7. How many memory chips are needed to construct $2 M \times 16$ memory system
using $512 K \times 8$ static memory chips?
8. What is virtual memory and what are the benefits of virtual memory?
9. What is meant by bus arbitration?
10. Name and give the purpose of widely used bus standard.

PART B — ($5 \times 16 = 80$ Marks)

11. (a) (i) Describe the role of system software to improve the performance of
a computer. (Marks 8)
(ii) Design a 4-bit adder/subtracter circuit using full adders and explain
its function. (Marks 8)
Or
(b) (i) What are the special registers in a typical computer? Explain their
purposes in detail. (Marks 8)
(ii) Design a 4-bit fast adder and explain its function in detail. (Marks 8)

12. (a) (i) Draw and explain the block diagram of a complete processor. (Marks 6)
(ii) Briefly describe the design of a hardwired control unit. (Marks 10)
Or

(b) (i) Explain the basic organization of a microprogrammed control unit and the generation of control signals using microprogram. (Marks 12)

(ii) What are the advantages and disadvantages of hardwired and microprogrammed control? (Marks 4)

13. (a) (i) Describe the role of cache memory in pipelined system. (Marks 8)

(ii) Discuss the influence of pipelining on instruction set design. (Marks 8)

Or

(b) What is instruction hazard? Explain the methods for dealing with the instruction hazards. (Marks 16)

14. (a) (i) What are the different secondary storage devices? Elaborate on any one of the devices. (Marks 8)

(ii) Explain how the virtual address is converted into real address in a paged virtual memory system. (Marks 8)

Or

(b) (i) Explain approaches for addressing multiple-module memory systems with suitable diagrams. (Marks 6)

(ii) Briefly describe magnetic disk principles and also the organization and accessing of data on a disk. (Marks 10)

15. (a) (i) Describe the hardware mechanism for handling multiple interrupt requests. (Marks 8)

(ii) What are handshaking signals? Explain the handshake control of data transfer during input and output operation. (Marks 8)

Or

(b) (i) What are the needs for input-output interface? Explain the functions of a typical 8-bit parallel interface in detail. (Marks 10)

(ii) Describe the USB architecture with the help of a neat diagram. (Marks 6)