Register Number: ……………………..

B.E / B.TECH DEGREE EXAMINATIONS: APRIL/MAY 2014

(Regulations 2009)

Third Semester

CSE105 : COMPUTER ARCHITECHTURE

(Common to CSE & IT)

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Zero address instruction format is used for
   a) RISC architecture
   b) CISC architecture
   c) Von-Neuman architecture
   d) Stack-organized architecture

2. Stack overflow causes
   a) Hardware interrupt
   b) External interrupt
   c) Internal interrupt
   d) Software interrupt

3. Negative numbers cannot be represented in
   a) Signed magnitude form
   b) 1's complement form
   c) 2's complement form
   d) 8-4-2-1 code

4. In addition of two signed numbers, represented in 2's complement form generates an overflow if
   a) $A . B = 0$
   b) $A = 0$
   c) $A \oplus B = 1$
   d) $A + B = 1$

5. Which method is used for resolving data dependency conflict by the compiler itself?
   a) Delayed load
   b) Operand forwarding
   c) Pre-fetch target instruction
   d) Loop buffer

6. Which activity does not take place during execution cycle?
   a) ALU performs the arithmetic & logical operation
   b) Effective address is calculated
   c) Next instruction is fetched
   d) Branch address is calculated & Branching conditions are checked

7. In a virtual memory system, the addresses used by the programmer belongs to
   a) memory space
   b) physical addresses
   c) address space
   d) main memory address

8. How many 128 x 8 RAM chips are needed to provide a memory capacity of 2048 bytes?
   a) 8
   b) 16
   c) 24
   d) 32

9. During DMA acknowledgement cycle, CPU relinquishes
   a) Address bus only
   b) Address bus & control bus
   c) Control bus & data bus
   d) Data bus & address bus

10. In a non-vectored interrupt, the address of interrupt service routine is
    a) Obtained from interrupt address table
    b) Supplied by the interrupting I/O device
    c) Obtained through Vector address generator device
    d) Assigned to a fixed memory location

PART B (10 x 2 = 20 Marks)

11. Define IR and MAR/MDR.

12. What is SPEC? Specify the formula for SPEC rating.

13. What is a ripple carry adder?

14. State the rule for floating point multiplication.

15. What is hard-wired control? How is it different from micro-programmed control?

16. Why is branch prediction algorithm needed? Differentiate between static and dynamic techniques.

17. Define the term hit, miss and ratio with respect to cache.

18. What is the use of EEPROM?

19. Distinguish between isolated and memory - mapped I/O?

20. What is meant by bus arbitration?

PART C (5 x 14 = 70 Marks)

21. a) (i) Explain different types of instructions with an example. Compare relative merits and demerits. (8)

      (ii) Discuss the factors influencing the software performance. (6)

(OR)

  b) (i) Why do we use addressing mode? Explain the different types of addressing mode with an example. (7)

      (ii) Explain the various operations involved in Stack & Queue. (7)

22. a) (i) Derive and explain an algorithm for adding and subtracting 2 floating point (8)
       binary numbers.
    (ii) Design a 4-bit fast adder and explain its function. (6)

(OR)

    b) (i) Explain with an example how to multiply two unsigned binary numbers. (7)
    (ii) Describe an algorithm for Integer division with suitable example. (7)

23. a) (i) Explain the execution of a three operand instruction using multiple bus (7)
       organization.
    (ii) Describe the techniques for handling Instruction hazards in pipelining. (7)

(OR)

    b) (i) Explain the control signal generation using hardwired and micro programmed (8)
       control with necessary block diagram.
    (ii) Discuss the basic concepts of pipelining. (6)

24. a) (i) Draw the block diagram of two types of DRAMs and explain. (7)
    (ii) Discuss the steps involved in the address translation of virtual memory with (7)
       necessary block diagram.

(OR)

    b) (i) Explain the need for cache memory and discuss the different types of mapping (8)
       function with necessary block diagram.
    (ii) Write short notes on magnetic hard disks. (6)

25. a) (i) What is an interrupt? Explain the different types of interrupts and the different (8)
       ways of handling interrupts.
    (ii) Write a note on SCSI BUS. Explain with a neat diagram. (6)

(OR)

    b) (i) With a neat sketch explain the working principle of DMA. (7)
    (ii) What are the needs for input-output interface? Explain the functions of a typical (7)
       8-bit parallel interface in detail.

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