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10CS46

Fourth Semester B.E. Degree Examination, Dec.2015/Jan.2016

Computer Organization

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Explain the function of processor registers with a block diagram. **(08 Marks)**

b. Derive the basic performance equation. Discuss the measures to improve the performance. **(08 Marks)**

c. List the different systems used to represent of signed number and give one example for each. **(04 Marks)**

2 a. What is an addressing mode? Explain only four addressing modes with an example for each. **(10 Marks)**

b. Registers R_1 and R_2 of computer, contain the decimal values 1200 and 4600. What is EA of the memory opened in each of the following instructions?

i) Load 20 (R_1), R_5 ii) Move # 3000, R_5

iii) Store R_5, 30(R_1, R_2) iv) Add – (R_2) R_5 v) Subtract (R_1)+, R_5 **(05 Marks)**

c. What is subroutine linkage? Explain with an example subroutine linkage using linkage register. **(05 Marks)**

3 a. What is interrupt? Explain polling and vectored interrupts. **(07 Marks)**

b. What is bus arbitration? Explain the centralized arbitration with a neat diagram. **(07 Marks)**

c. What is DMA? Explain the registers in a DMA interface. **(06 Marks)**

4 a. Explain with block diagram a general 8 bit parallel interface. **(10 Marks)**

b. Describe how a read operation is performed on the PCI bus. **(10 Marks)**

PART – B

5 a. Draw the organization of a 1K × 1 memory cell and explain its working. **(08 Marks)**

b. Show with diagram the memory hierarchy with respect to speed, size and cost. **(05 Marks)**

c. With a block diagram explain about direct mapping cache memory. **(07 Marks)**

6 a. Discuss the Booth's multiplication algorithm, with an example. **(10 Marks)**

b. With figure, explain circuit arrangements for binary division. **(05 Marks)**

c. Illustrate the steps for non – restoring division algorithm on the following data : dividend = 1000, divisor = 11. **(05 Marks)**

7 a. List out the actions needed to execute the instruction add (R_3), R_1. Write and explain sequence of control steps for the execution of the same. **(08 Marks)**

b. Write a control sequence for on unconditional branch instructions. **(04 Marks)**

c. Explain the 3 bus organization of the processor. **(08 Marks)**

8 a. With a neat diagram, explain the organization of a shared memory multiprocessor. **(08 Marks)**

b. What is hardware multithreading? Explain the different approaches to hardware multithreading. **(08 Marks)**

c. Explain single instruction stream, multiple data stream (SIMD). **(04 Marks)**

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