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Computer Engineering Department
First Exam, Second Semester: 2010/2011

Course Title: Advanced Computer Architecture
Course No: 630561
Instructor: Prof. Kasim Al-Aubidy

Date: 4/4/2011
Time Allowed: 60 minutes
No. of Pages: 2

QUESTION ONE: [40%]

RISC Characteristics

[A]. List main differences between RISC & CISC based on given factors?

Factor	CISC	RISC
Internal Registers		
Instruction Format		
Addressing Modes		
CPI Average		

[B]. A computer with overlapped register windows has 10 global registers, 8 local registers, 4 common registers, and 4 windows.

1. Draw a simple layout showing the organization of the registers?
2. Calculate the total number of registers available for each window?
3. Determine the window size?
4. Calculate the register file for such a computer?

QUESTION TWO:**[60%]***Pipeline Design & Evaluation*

[A]. Design 4-bit fixed point ADD/SUB pipeline?

[B]. In certain scientific computations it is necessary to perform the following arithmetic operation with a stream of numbers;

$$F_i = A_i / (B_i - C_i) + D_i$$

1. Specify a pipeline configuration to carry out this task?
2. Determine the required number of segments?
3. List the contents of all registers in the pipeline for $i = 1$ through 7?
4. If the pipeline is used to process **1000** tasks, calculate its speedup factor?