ECEn 528

Study Guide – Vector Architectures

● Read Sections 4.1 ­ 4.2 of H & P  Things to focus on

■ How vector instructions flow through the pipeline

■ How to analyze vector execution time

 Clarifications

■ None

 Answer the following questions:

1. Exercise 4.9, parts (b)­(e). NOTE: the 2nd question in (c) is actually question (d)

b.

load first 44

init index

v1 = load a\_re

v2 = load b\_re

v5 = multiply v1, v2

v3 = load a\_im

v4 = load b\_im

v6 = multiply v4, v5

v7 = subtract v5, v6

store v7

v5 = multiply v1, v4

v6 = multiply v3, v2

v7 = add v5, v6

store v7

if first iteration, increment index by 44

else increment index by 256

if index less than 1200, jump to beginning

c. 6 chimes

d. 6 chimes \* 64 elements

+ 15 L/S \* 6

+ 8 mult \* 4

+ 5 add/sub \* 2

= 516/iteration

e. No change; adding more L/S units doesn’t help in this case