

**KING FAHD UNIVERSITY OF PETROLEUM & MINERALS  
COMPUTER ENGINEERING DEPARTMENT**

**COE 308-01, Term 982**

**Solution to Homework #1**

1) 
$$\text{CPI for Mbase} = 2 \times 0.4 \times \text{IC} + 3 \times 0.25 \times \text{IC} + 3 \times 0.25 \times \text{IC} + 5 \times 0.1 \times \text{IC} / \text{IC}$$
$$= 2.8$$

$$\text{CPI for Mopt} = 2 \times 0.4 + 2 \times 0.25 + 3 \times 0.25 + 4 \times 0.1$$
$$= 2.45$$

2) 
$$\text{MIPS for Mbase} = 50 / 2.8 = 17.86 \text{ MIPS}$$

$$\text{MIPS for Mopt} = 60 / 2.45 = 24.49 \text{ MIPS}$$

3) 
$$\text{CPU time for Mbase} / \text{CPU time for Mopt} = (\text{IC} \times 2.8 / 50) / (\text{IC} \times 2.45 / 60) = 1.37.$$

Therefore Mopt is 37% faster than Mbase.