I)

In order to put the University’s information system in use, there are three approaches:

1. In-house development
2. Outsourcing
3. Hybrid

**Analysis:**

Business Components:

* GUI:
  + Build Cost: 50\*300 + 50\*300 = $30,000
  + Purchase Cost: 300\*30 + 40\*50 + 30\*300 = $20,000
  + Reuse Savings:
    - (0.4\*30000)\*(50-1) = $ 588,000 (in-house)
    - (0.4\*20000)\*(50-1) = $ 392,000 (outsource)
  + Cost Per User:
    - 30000/10000 = $ 3 (in-house)
    - 20000/10000 = $ 2 (outsource)
* Server:
  + Complexity Cost: $ 20,000
  + Build Cost: 50\*500 + 50\*500 = $ 50,000
  + Purchase Cost: 30\*500 + 30\*500 + 50\*40 = $ 32,000
  + Reuse Savings:
    - (1.5\*50000)\*(50-1) – 20000 = $ 3,655,000 (in-house)
    - (1.5\*32000)\*(50-1) – 20000 = $ 2,332,000 (outsource)
  + Cost Per User:
    - (50000+20000)/10000 = $ 7 (in-house)
    - (32000+20000)/10000 = $ 5.2 (outsource)
* Domain:
  + Build Cost: around est. $ 60,000
  + Purchase Cost: est. $ 40,000
  + Reuse Savings:
    - 10\*60000\*(50-1) – 20000 = $ 29,420,000 (in-house)
    - 10\*40000\*(50-1) – 20000 = $ 19,580,000 (outsource)
  + Cost Per User:
    - (60000+20000)/10000 = $ 8 (in-house)
    - (40000+20000)/10000 = $ 6 (outsource)

For those three solutions: in-house development need all developers are from inside the university; outsourcing the work would be much easier inside university, what they have to do is simply sending the work to other developers; a hybrid approach would be a mixture of the above two.

As we can see from the Analysis, in-house development is more expensive, but has a decent reuse saving value. In-house development in total would cost $140,000. The total reuse saving of in-house is $33,663,000. Outsourcing the work would cost $92,000 in total. The total reuse saving of outsourcing is $22,304,000.

Since the university would definitely last over 5 years, and in the long term, in-house reuse saving is much greater than outsourcing the work with a value of $ 33,663,000, which is $ 11,359,000, and in-house’s cost is only $ 48,000 greater than outsourcing’s.

II) UUCP = 3\*3 + 4\*13 = 61

UCP = 61\*16 \*5.5 = 5368 (assume the TCF is the total of T1 to T14 in the chart, and EF is the total of E1 to E9 in the chart)

Effort = 5368 \* 20 = 107360 (assume former PHperUCP is 20)

Assuming the labor cost is $100 per person hours, the cost for application software development will be 100\*107360 = $ 10,736,000