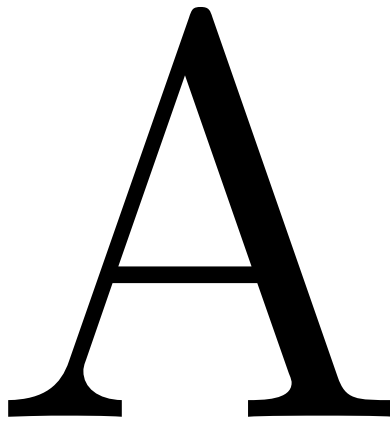COURSE ECE354

Quiz IIa

July 20, 2009

1. The computer has three memory frames. The running program requests pages in the following order: 2,3,2,1,5,2,4,5,3,2,5, and 2. Show the allocation of pages to frames after each page using an optimal policy (optimality criterion is the number of page faults, and the lower the better). *[10p]*

2. Two parents and a child are standing in front of a cookie dispenser. The parents feed the machine with coins. The machine prepares cookies and dispenses them once the deposited amount exceeds four cents. The child continuously stares at the cookie machine and whenever it sees a cookie, then it grabs the cookie and eats it.

   Available functions include: Parents use *PrepareCoin()* to prepare the next coin to be inserted. Parents use *InsertCoin()* to deposit the one cent in the machine. The machine uses *PrepareCookie()* to bake the next cookie. The machine uses *DispenseCookie()* to dispense the baked cookie. The kid uses *GrabCookie()* to take the dispensed cookie. The kid uses *EatCookie()* to eat the taken cookie. Assume that the usual functions mentioned in the book such as *parbegin(. . .)* are available. Assume that *PrepareCoin()* takes a random amount of time, often much longer than all the other functions.

   Make sure that the kid takes/eats only when a cookie is available. The kid would be very unhappy otherwise. Make sure that the machine only dispenses cookies when enough funds have been deposited. Make sure that the parents never try to insert coins simultaneously. This will jam the machine and will make the kid cry, because it will get no more cookies. Furthermore it will make the parents very unhappy, because the child is crying now. Also make sure that the kid doesn't touches the dispenser before the machine finished has dispensing the baked cookie.

   [10p]

   End of quiz. Total points: 20

A

Quiz guide: The exam consists of 2 questions listed on one page. The exam's total number of points is listed at the end. The quiz duration is 35 minutes. Note make sure you don't have the same quiz ID as any of your neighbours. If you have, say so immediately. **If you don't, you will invalidate your score.**