Northern Michigan University (Marquette Co, MI)

CS444-01-25F: Parallel & Distributed Processing (Andrew A. Poe) Name: _____
Practice Quiz 7 Wednesday 29 October 2025 9:00 A.M. EDT

SLEEPING BARBER:

There are five chairs in a barbershop. When a customer wants a haircut, there are four phases: a) Wait for a chair b) Wait for the barber c) Get haircut d) Leave barbershop (you don't have to wait to leave the barbershop). It's possible that step a or steps a and b can be omitted if there is no reason to wait. (If a chair is empty when the customer arrives there is no need to wait for one. If the barber is not cutting hair already then there is no need to wait for the barber either.)

We don't need a thread to emulate the barber. Just have the customer print that he's getting a haircut, wait five minutes, and then print that he's exiting.

You will need a chair semaphore, a barber semaphore, and an administrative semaphore. Use a good baton passing strategy for this.

```
P (admin);
if (nc == 5) {
 ncw++;
 print ("Waiting for a chair");
 V(admin);
 P(chair);
 ncw--;
}
nc++;
if (nb > 0) {
 nbw++;
 print ("Waiting for the barber");
 if (nc < 5 && ncw > 0) {
  V (chair);
 } else {
  V (admin);
 }
 P (barber);
 nbw--;
}
nb++;
if (nc < 5 && ncw > 0) {
 V (chair);
} else {
 V (admin);
}
print ("Getting my haircut");
sleep (300);
P (admin);
nb--;
nc--;
print ("Exiting")
if (nbw > 0) {
 V (barber);
} else {
 if (ncw > 0) {
  V (chair);
```