

Name:

Student ID:

CSC 120 (R Section) — Quiz #2 — 2016-02-26

No books, notes, or calculators are allowed. You have 30 minutes to write this quiz.

Question 1: [30 Marks] In the five blank areas below, write what R will output at that point if the commands shown are typed into the R console window. Note that the ">" shown at the beginnings of lines is the R command prompt, not something typed.

```
> M <- matrix (7, nrow=3, ncol=4)
> M[2,3] <- 10
> M[1,4] <- 20
> M
```

```
> M[1,] + M[2,]
```

```
> L <- list (dog=1:4, cow=20, pig=37)
> L$cow + L$dog
```

```
> L[[3]] - L$cow
```

```
> set.seed(7)
> runif(1)
[1] 0.9889093
> runif(1)
[1] 0.3977455
> runif(1)
[1] 0.1156978
> sample(4)
[1] 1 4 2 3
> set.seed(7)
> v <- c (12, 10, 23)
> if (runif(1) < 0.5) v[1] <- runif(1) else v[2] <- runif(1)
> v[3] <- runif(1) + 3
> v
```

Question 2: [30 Marks] Consider a function called `mystery` defined as follows:

```
mystery <- function (A, what=0) {  
  v <- numeric(nrow(A))  
  for (i in 1:nrow(A)) {  
    for (j in 1:ncol(A))  
      if (A[i,j]==what) v[i] <- v[i] + 1  
    }  
  }  
  v  
}
```

Below are two calls of this function. Write after them what R will output as a result of these calls.

```
> mystery (matrix (c (7, 0, 9, 4, 3, 8, 0, 0, 2, 0), nrow=5, ncol=2))
```

```
> mystery (matrix (1:9, nrow=3, ncol=3), what=9)
```

Question 4: [40 Marks] Write a definition for a function called `no_neg_rows` that takes one argument, called `mat`, which you should assume is a numeric matrix. The function should return as its value a numeric matrix with the same number of rows and columns as its argument, `mat`, and which has the same elements as `mat` except that if the sum of the elements in a row of `mat` is negative, then in the matrix returned, the negative elements in this row should be changed to zeros.

Here is an example call of this function:

```
> M <- matrix (c (0, 3, -2, 4, 1, -1, 5, 3, 3, -2, -7, -8), nrow=4, ncol=3)  
> M  
      [,1] [,2] [,3]  
[1,]    0    1    3  
[2,]    3   -1   -2  
[3,]   -2    5   -7  
[4,]    4    3   -8  
> no_neg_rows(M)  
      [,1] [,2] [,3]  
[1,]    0    1    3  
[2,]    3   -1   -2  
[3,]    0    5    0  
[4,]    4    3    0
```