R Programming – Sample Questions

(Note: The questions here are for revision purposes only, and are shorter that questions that would be asked in the exam.)

(1) For the following R code, draw a diagram of the binding environment after the code has been executed.

```
f1 <- function(x){
  sqrt(x)
}


f2 <- function(x){
  x^3
}

y <- 9

x <- f1(y)

z <- f2(x)
```

(2) Show (using diagrams) the different environments created by the following code:

```
f <- function(des, power){

 function(x){
  x^power
 }
}

sq <- f("This is a square function",2)

ans <- sq(6)
```

Add an extra function to the closure so that the parameter values can be returned (hint, a list should be used to return more than one function from the closure).

Update the diagram to show the new structure.

(3) Implement a stock keeping unit (SKU) S3 class in R. Each SKU has two pieces of information:

- *id*, which stores the unique code
- *onHand*, which contains the number of items currently in stock.

Implement S3 (generic) functions to

(1) increase the stock value, and

(2) reduce the stock amount.

(3) Implement a function that returns the number of stock items currently on hand.

Implement a constructor function as part of the solution.

(4) Using the appropriate function from the package **tidyr**, convert the following data frame into tidy data format.

```
  Year    TVs Radios Computers Phones
1 2016 120000  40000    100000  45000
2 2015 110000  55000    120000  40000
3 2014  90000  57000    140000  33000
4 2013  98000  90000    110000  35000
5 2012  70000  98000    100000  19000
```

Using the **dplyr** package, write scripts (making use of the pipeline operator) to perform calculations on the tidy version of the data set to produce the following output:

- Total sales per year (Descending)
- Total sales by product
- Total sales by product for each year (Descending)