

University of Swaziland

Department of Computer Science

Examination

2017/2018

First Semester

Title of Paper: Introduction to Computer Science

Course Code: CSC111

Time Allowed: Three (3) Hours

Instructions: Answer Question one and any other three Questions. Don't write anything on the Examination Question paper.

You are not allowed to open this paper until you have been told to do so by the invigilator.

CSC111 INTRODUCTION TO COMPUTER SCIENCE

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QUESTION ONE

- a. Which model defines the basic components of the computer? Explain and support your explanation with a diagram 10marks
- b. Briefly discuss the generations of computer 5marks
- c. List five benefits why you think professionals are interested in introducing new students in Computer Science and Engineering to R Programming first? 5marks
- d. Consider the following lines of R code entered in the RScript on the IDE window
- ```
y <- 26
while(y >= 0){
 y <- y - 1
}
```
- i. What is the value of y when this loop finishes running? 1 mark
- ii. Looking at the code above, how many loops (or iterations) will this code take to run 1 mark
- iii. Write out all the value of y at each stage of the iteration 3marks

### QUESTION TWO

- a. Explain the generations of programming language 5marks
- b. Convert BC8 in hexadecimal to binary directly or using binary coded hexa 5marks
- c. Consider the following lines of R code entered in the R command window:
- i. `list1 <- list(c(2,5,3),21.3,sin)`
- ii. `Y = 6:9;`
- iii. `W = 3;`
- iv. `M = matrix( c('a','a','b','c','b','a'), nrow = 2, ncol = 3, byrow = TRUE)`
- v. `a <- "Hello"`  
`b <- 'How'`  
`c <- "are you? "`  
`print(paste(a,b,c))`

What is the output when the commands are typed in sequence from the R command window?  
Do not worry about the exact format of the output 15marks

### QUESTION THREE

- a. Write short notes on the types of translators with the support of two examples for each 9marks
- b. Explain ASCII and use it to explain parity bits on the word "UNISWA" 7marks
- c. Convert 101101 in binary to decimal 4marks

- d. If you run each of the following lines of code in R, what will be the *class* of the resulting object:
- i. `y<- "Welcome to UNISWA"`
  - ii. `z<- 'Siyanbonga'`
  - iii. `a <- c(1.8, 4.5)`
  - iv. `b <- c(1 + 2i, 3 - 6i)`
  - v. `d <- c(23, 44)`

5marks

#### QUESTION FOUR

- a. Explain operating system and its types with two examples for each 7marks
- b. List and explain four characteristics of operating systems 8marks
- c. Differentiate between `c()` and factor function in R with the support of an illustrative example 5marks
- d. Convert 101101 in binary to octal directly or using binary coded octal 5marks

#### QUESTION FIVE

- a. Write short note on the following with the support of two examples for each
  - i. Word processing packages 3marks
  - ii. Spreadsheet packages 3marks
  - iii. Statistical packages 3marks
  - iv. Accounting packages 3marks
  - v. DBMS packages 3marks
- b. Convert 8GB to bits 5marks
- c. Write the lines of R code required to compute the amount of interest to be paid on a loan of E5000 held for 3 years at an interest rate of 4% compounded annually in RScript using IDE Windows. 5marks

#### QUESTION SIX

- a. Explain OSI model 7marks
- b. Differentiate between the followings
  - i. ASCII and EBCDIC 2marks
  - ii. Data frame and matrices 2marks
  - iii. Primary storage and secondary storage 2marks
  - iv. softcopy and hardcopy 2marks
- c. Write RScript to solve a linear equation involving three unknowns in R using IDE environment in window.
 
$$3x+5y-7z=21$$

$$8x+9y-11z=30$$

$$6x+10y+16z=45$$

5marks
- d. List and explain four benefits of student participation in HFOSS 4marks