## SECTION B

Q6 a) List three advantages of using functions in C programming. **(3 marks)**

b) Briefly differentiate between passing by values and passing by parameters. **(1.5 marks)**

c) Write a function that converts the temperature degree from Centigrade to Fahrenheit or vice versa. The function should therefore take in two integer values; one for the temperature to be converted and another for the choice, which will be either **1** if the value is converted to Fahrenheit or **0** if the value is converted to Centigrade. It should then return a float value of the result. **Note:** The formula for conversions are; **C = 5/9 (*F*-32)** and **F= 9/5 (*C*+32)** where C is Centigrade and F is Fahrenheit. **(7.5 marks)**

Q7. Given a simultaneous set of equations, write a program that will solve for 'x' and 'y' given that A, B, C, M, N and P are constants. The program should solicit and accept values for these constants, compute the value of **x** and **y** and print out these values of x and y. **(12 marks)**

$Ax + By = C$ —(i)
$Mx + Ny = P$ —(ii).

Q8. Write a program that accepts marks of type float for three subjects, Physics, Chemistry and Mathematics, for a number of students. The program should compute the average score for the three subjects for each student. Afterwards, the program should send these marks to an Excel sheet called "Results.xlsx" if the average is more that 50 and send to the file called "FAILURE.xlsx" when the scores are less than 50.

***Hints:***

1. Use structures to manage these students records
2. The number of students will be provided by the user

Each of these files will look like the following:

| Registration Number | Physics | Chemistry | Mathematics | Average |
|---|---|---|---|---|
| 2009-04-00324 | 45 | 57 | 76 | 59.33 |

**(12 marks)**

Q9 a) Write a program that copies from one file, call it **source.txt**, and paste the contents in the second file, call it **destination.txt** **(4 marks)**

b) List the three ways in which pointers can be used in C. **(3 marks)**

c) Write a function that computes the volume of a sphere by taking in the radius as a float data type and returns volume as a float data as well. This is only if the radius value was positive, otherwise, returns -1. **(5 marks)**



$\frac{4}{3}\pi r^3 h$.

## Section A

Q1.) With brief examples differentiate between the following: **(1.5 marks each)**

a) *Structures* and *Arrays*
b) *Global* and *Local Variable*
c) *C language* and *Assembly Language*
d) *Text Files* and *Binary Files*

Q2.) With distinct stages, illustrate the process of C program compilation. **(2 marks)**

Q3.) Explain each of the following: **(1 mark each)**

a) C is a "high-level assembly language"
b) Array is related to pointers
c) A stack is a restricted data structure

Q4.) Assume that all the necessary files have been imported and the main function opened; establish the output for the following code fragments: **(1.5 marks each)**

a.
```
int my_array[] = {1,23,17,4,-5, 9,8}; int *ptr; int i; ptr =
my_array; for(i=2;i<6;i++) {printf("%d ",*(ptr++));}
```

b.
```
int *j,k;  int i=10;  j=&i;  for (k=5;k>=1;k--)  printf("\t
%d",k**j);
```

c.
```
char user[] = "Eurassia";  char suspect[] = "Mishel Desler";
/*UE 2011*/ strcpy(suspect, user);  printf
("%d",strlen(suspect));
```

d.
```
int zet = 4; int x = 2; (x>5)?printf("There is a
Problem"):printf(" %d ",2+zet);}
```

Q5 a) Identify errors in the following program; make reference to line numbers: **(5 marks)**

```
1.  #include <stdio>
2.  main( );
3.  {
4.  FILE *fptr;
5.  char fname = "Tanzania Huru";
6.  // this file, Testing.odt, is
7.  in the same folder
8.  fp = fopen("Testing.odt","r");
9.  fprintf(fp,"%s", fname);
10. fclose(fp);
11. }
```