SECTION A

Q 1

a. Compare and contrast the following pairs (10 marks)
   i. An array and a linked list
   ii. A structure and a union
   iii. Break and continue
   iv. A binary file and a text file

b. Establish the output of the following code fragments (12 marks)

i.
```
#include<stdio.h> main(){ int a[]={10,20,30,40};int i=3,x;
x=1*a[--i]+2*a[--i]+3*a[--i]; printf("%d",x);}
```

ii.
```
#include<stdio.h> main(){ char info[] = "12Days";
isdigit(info[1])? printf("%d\t", info[1] + 2): printf("%s\n", info); }
```

iii.
```
main() { int x; for(x=-1; x<=10; x++) { if(x < 5) continue; else break;
printf("UHURU"); } }
```

iv.
```
int temp, score[] = {7,5,12,10,-1}; if (score[1] < score[4])temp =
score[4]; else temp = score[0]; printf("%d",temp);
```

v.
```
#include <stdio.h> main(){int i, sum = 0; for(i=0; i<10; i++){
if(i==5)break;                    sum = sum + i; } printf(" The sum is %d\n",
sum);}
```

c. Re-write the following using ternary operators (3 marks)

```
if(gpa >= 4.4) class = "First"; else if (gpa >= 3.5) class = "Upper Second";
else if  (gpa >= 2.5) class = "Lower Second"; else class = "Gentleman";
```

SECTION B

Q 2

a. List three advantages of using functions (3 marks)
b. Describe the four storage classes of identifiers (4 marks)
c. With Examples, differentiate between passing by value and passing by reference (4 marks)
d. Write a function that takes in the year of birth and gives out a person's age. In the course of doing that, check that the year of birth is between 1900 and 2010. (7 marks)
e. Write a function that takes in address of an array whose elements are integers and number of elements of the array (array size). The function should multiply each element of the array by two (2) and return nothing (7 marks)

Q 3

a. Define a node of a linked list which has a data field called **data** of type float and an address field called **link** (3 marks)
b. Given that the first address of the linked list you created in 'a' above is called **begin**, write a function in each of the following;
   i. To add an element in the beginning of the list (8 marks)
   ii. To multiply the element of the list by a certain factor. (8 marks)
   iii. To "pop" from a stack, assuming the same definition is used to implements a stack (6 marks)