UNIVERSITY OF DAR ES SALAAM

SCHOOL OF INFORMATICS AND COMMUNICATION TECHNOLOGY

COMPUTER SCIENCE UNIT

IS 136: UNIVERSITY EXAMINATION, JULY 2010

Attempt all the Questions in **Section A** and any three Questions in **Section B** **Duration: 2hours.**

Section A

Q 1: Define the following terms **(3 marks)**

a) A pointer
b) A variable
c) An array

Q 2: With examples differentiate between the following **(6 marks)**

a) A linked list and an array
b) **printf()** function and **scanf()** function
c) A constant and a variable

Q 3: Explain the following phrases **(2 marks)**

a) A stack is a *restricted data structure*
b) C is "Case Sensitive"

Q 4: Provide the output for the following C code fragments **(6 marks)**

a) **union** industry { **int** grade; **double** returning; **char** type; }; main() { **printf**("Memory needed in bytes is %d",**sizeof**(union industry)); }
b) main(){**int** z, X; z = 7; X = --z; **printf**("The value of z is %d and that of X is %d",z,X);
c) main(){ **float** tz, ke, ug; tz = 7.50;ke = 10.25;ug = (tz < ke) ? tz : ke; **printf**("Ugandaz Grade is %.2f",ug); }
d) main() { int *j,k; int i=10; j=&i; for (k=5;k>=1;k--) printf("\t %d",k * *j); }

Q 5: What will be the file position of the file marker in; **(2 marks)**

a) fseek(ptr, 0, SEEK_SET);
b) fseek(ptr, 0, SEEK_CUR);

Q 6: Identify syntax errors in the following program and briefly explain each of them with reference to line numbers **(5 marks)**

```
1.  #include <stdio.h>
2.  #include <stdlib.h>
3.  int fact(int i){
1                   int j,k; j=1;
5.                  for (k=2; k<=i; k++)
6.                  j=j*k;
7.                  return j;
8.      }
9.  main()
10.   int number, value;
11.   printf("Please enter the number ")
12    scanf("%d",number),
13      value = fact(&number);
14      printf("The factorial is %d\n",value);
15. }
```

Question 3 (25 marks)

a. Briefly explain the significant of using function prototypes in C Programming Language. **(2 marks)**

b. Differentiate between the following **(4 marks)**
   i. Boiler plates and user functions
   ii. External storage class and Static storage class

c. List two drawbacks in using register storage class in C Programming Language **(4 marks)**

d. Write a program which takes two parameters from the user. The first parameter will be a string value of variable **name** and the second is an integer value for a variable **choice**. If choice is 1 the program should call a function which will return the name in lower case. If choice is 2 the program should call a function which will return the name in upper case. If choice is 3 the program should call a function which will return the name in reverse order. When the choice is not between 1 and 3 the program should display "*wrong choice*" to the user. **(15 marks)**

Question 4 (25 marks)

a. With example describe two ways a union can be declared. **(4 marks)**

b. Differentiate between the following: **(6 marks)**
   i. An array and a union
   ii. A union and a structure

c. Write a program which will implement the bank account scenario. Your account program should implement the following functions **createAccount**, **checkBalance**, **deposit**, **withdraw** and **transfer.** The users will operate your program through the menu option 1-5 with each choice pointing to one of the functions above. Note use union to store data in your program **(15 marks)**

Question 5 (25 marks)

a. Differentiate between the following. **(6 marks)**
   i. Text file and Binary file
   ii. Read mode and write mode
   iii. Write mode and append mode

Write a code fragment which will open a file named "IS136.txt" and insert a string "This is IS Semester Imekwisha" 15 bytes from the beginning of the file. The code fragment should check if the file exists before opening it. **(6 marks)**

Write a program which does the following: **(13 marks)**
   i. Accepts 50 bank customers' records from the keyboard. Each record should contain the attributes; Surname, First Name, Account Number, Principle, Time.
   ii. The program should compute the Interest for each record entered. (I =PRT/100 and R = 5)
   iii. The program should also write these records into a text file named "Interest.txt".