KABARAK UNIVERSITY

EXAMINATIONS

2008/2009 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF SCIENCE, COMPUTER SCIENCE

COURSE CODE: **COMP 111**

COURSE TITLE: **INTRODUCTION TO PROGRAMMING**

STREAM: **Y1S1**

DAY: **THURSDAY**

TIME: **11.00 - 1.00 P.M.**

DATE: **11/12/2008**

INSTRUCTIONS:

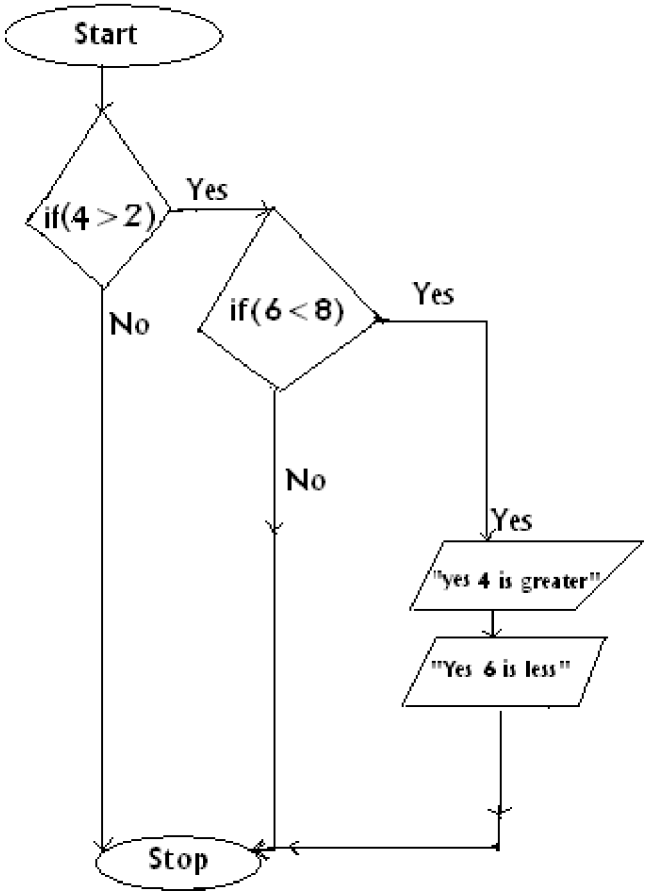
Attempt question ONE and any other TWO questions

PLEASE TURN OVER

QUESTION ONE (30 MARKS)

a. Briefly explain the differences between high and low level languages **(4marks)**

b. Translate the following flowchart into an executable code in C language:



(6marks)

c i) What are the **four** basic data types in **C** language? **(2marks)**

ii) Explain when each of the data types in (i) above is used (**4marks**)

d) i) State the differences between a ***while*** loop and a ***do-while*** loop. (**2marks**)

ii) Make corrections in the following c program and show the results:

```
#include<stdio.h>
int main
  int a = 10; i = 4;
  while(I > 0)
        a-= 2; i--;
      printf("a is %d\n", a);
    return 0;
```

(6marks)

d) Create an integer array program with the following **four** elements:

4, **6**, **32**, and **19**, and display the output as follows:

Element 0 contains 4
Element 1 contains 14
Element 2 contains 37
Element 2 contains 19 (**6 marks**)

Question 2 (20 marks)

a) i) What is a *pointer*? (**1 mark**)

ii) If a variable named ***jimmy*** has been declared as an integer with an initial value of 16, using a *pointer*, write a program that would display both the value and the address of ***jimmy***. (**6 marks**)

b) Write a program in **C** that would be used to grade the students based on the following criteria:

1. Marks from 95 and above, one would get grade 'A'
2. Marks from 80 and above, one would get grade 'B'
3. Marks from 60 and above, one would get grade 'C'
4. Marks from 50 and above, one would get grade 'D'
5. Anyone whose score is less than 50, would be an 'F' (**8 marks**)

c) Correct the *syntax* errors in the following C program, by re-writing the whole program and **showing** the output.

```
#include<stdio.h>
{
 int main();

  for(i=0; i<5 );
      {
      printf("this time i is %d\n", i);
      i++
      }
      return 0;
 }
```

(**5marks**)

Question 3 (20 marks)

a) Briefly explain the purpose of each of the following terms:

(i) Control statements (ii) keywords (iii) comments (iv) variable (**4 marks**)

b) i) What is a function? (**2 marks**)

ii) Write a program in **C** that calculates the hypotenuse of a right-angled triangle.

Required:

1. Declare a prototype function called **calc()**
2. The **main()** function must call **calc()** function which will find the hypotenuse and return results to the **main()** function so that the **main()** would display on the screen
3. The **calc()** function has three local variables, and must prompt the user for the values of the length and width of a triangle (**10marks**)

c) What is the compiler instructed to do with the following 2 escape sequences:

(i) **\n** (ii) **\t** (**2 mark**)

d) State the purpose of the following two functions:

i) **scanf()**

ii) **printf()** **(2marks)**

Question 4 (20 marks)

a) Using a ***for loop***, write a program in **C** language that would produce the following output:

outer loop number is 2
inner loop number is 1
inner loop number is 2
outer loop number is 4
inner loop number is 1
inner loop number is 2
outer loop number is 6
inner loop number is 1
inner loop number is 2
outer loop number is 8
inner loop number is 1
inner loop number is 2 **(12marks)**

b) Draw the flowchart of the following code: (**4 marks**)

```
#include<stdio.h>
 int main() {
   int a,b;
   printf("enter value of a");
   scanf("%d", &a);
   printf("enter value of b");
   scanf("%d", &b);
  {
    if(a> b)
     printf("A");
    else
      printf("B");
   }
  return 0;
}
```

c) Using a nested if statements, write a C program to display the following output:

10 is greater than 4

and A is equal to A

but 1 is not equal to 0 (**4 marks**)

Question 5 (20 marks)

a). i) Study the following program and make any necessary corrections so as to produce some output.

```
#include<stdio.h>
 int square7(int x)
 int main()
  {
      int number2
      number2 = square(4)
      printf(" 4 * 4 = %d/n", number);
    return 0}
```

(**8 marks**)

ii) Make changes in the above program in **a**(**i**) above so that the "***called"*** function will be "asking" the user to enter an integer **4** to be squared. (**6 marks**)

c.) Explain the concepts of the following program, and then write the output if you were to enter integer **10**: (**6 marks**)

```
#include<stdio.h>
 void lastfunc(int x);
int main()
   {
        int number;
        printf("enter positive number to count from: ");
        scanf("%d", &number);
        lastfunc(number);
        return 0;
     }

 void lastfunc (int x)
       {
        printf("%d\n", x);
              --x;
               if(x < 0) return;
                 else
                      lastfunc (x);
          }
```