



KENYATTA UNIVERSITY
UNIVERSITY EXAMINATIONS 2009/2010
EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE
SCT 101: PROGRAMMING TECHNIQUES

DATE: Friday 30th July, 2010

TIME: 11.00 a.m. – 1.00 p.m.

Question 1 (COMPULSORY)

- a) C programming is said to be 'structured'. Explain. (3 marks)
- b) List and explain any FOUR components of C programs. (8 marks)
- c) State two unary operators we have in C and illustrate with an example the operation they perform (4 marks)
- d) Write a C program that request the user two numbers and prints the sum (3 marks)
- f) Write a program using a for loop that outputs the square of even integers between 2 and 20 (4marks)
- g) Distinguish the following terms (8 marks)
 - i. Passing by value and passing by reference
 - ii. getchar() and scanf() function
 - iii. Syntax errors and logical errors
 - iv. Floating point data type and integer data type

SECTION B (ANSWER ANY TWO QUESTIONS)

Question 2

- a) Why are the variables in the following list invalid (3 marks)
 - i. *value\$sum*
 - ii. *3lotsofmoney*
 - iii. *char*
- b) What is the outcome of the following, assuming: time=2, a=3, b=4, c=5 (4 marks)
 - i. *time -= 5;*
 - ii. *a *= b + c;*
- a) Rewrite the following statement using the if ..else construct. (3 marks)

*j = (j>i?0:i*i)*
- a) Write a program that either adds, subtracts, multiplies or divides two integers. The program should prompt the user to choose an operation, then prompt for the two numbers and display the result. (10 marks)

Question 3

- a) Write the syntax for the following statements:
- i) Define a symbolic constant PI with value 3.142.
 - ii) Assign the sum of two variables x and y to the variable total.
 - iii) Divide integer variable t by another integer variable z and assign the remainder to variable r.
 - iv) Assign character Y to character variable letter. (5 marks)
- b) The following program is supposed to find the square and cube of 5, but it has errors. Rewrite the correct version :

```
#include<stdio.h>
void main()
{
    int,x2,x3;
    X=5;
    X2=x*x;
    X3=x2*x2;
    printf("xsquare=%d ,xcubed=%d\n",x,x2,x3);
}
```

(5 marks)

- c) The following matrix represents the scores of 4 students(rows) in 5 tests(columns)

80	45	59	65	40
93	70	37	83	50
69	91	81	47	55
86	64	71	60	57

Initialize the above scores into a two-dimensional array. (3 marks)

- d) Write for loop which will produce the following output (hint: use two nested for loops)

```
1
22
333
4444
55555
```

(8 marks)

Question 4

- a) Differentiate between the following:
- i. Statement and block of statements
 - ii. Break and continue
 - iii. Source code and object code (6marks)
- =]
- c) Given a two dimensional array number[3][5], write a program that totals all elements and prints the total. (4 marks)

- d) Show how to create a structure called s_type that contains these five elements: Char ch, float d, int i, char str[80] and double balance. Also define a variable called s_var using this structure. (4 marks)
- e) Explain four commonly used input/output functions in C (4 marks)

Question 5

- a) What is the output of the following program?
Main()
{
int sum=50;
float mod;
mod=sum%10;
printf("The %% of %d by 10 is %f\n",sum,mod); (3 marks)
- b) Write a program in C which incorporates a function using parameter passing and performs the addition of three numbers. The main section of the program is to print the result. (9marks)
- d) Rewrite the following switch structure using if else statement:
- ```
switch(ch) {
case 'A': printf("%d", a+b);break;
case 'S': printf("%d", a-b);break;
case 'M': printf("%d", a*b);break;
case 'D': if (b!= 0)printf("%d", a/b);break;
default : printf("Invalid choice, try again");
}
```
- (4 marks)
- e) Write a program incorporating an array that calculates the sum and average of five floating point numbers entered from the keyboard. (4 marks)