THE UNIVERSITY OF TRINIDAD AND TOBAGO

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FINAL ASSESSMENT/EXAMINATION SEP-DEC 2017

Course Code and Title: PROG1004 - Programming I - ICT

Programme: Bachelor of Applied Science in Computer Engineering

Date and Time: Wednesday 29th November, 2017 1.00 p.m. – 4:00 pm **Duration: 3 Hours.**

PLEASE READ ALL INSTRUCTIONS CAREFULLY BEFORE YOU BEGIN THIS EXAMINATION

Instructions to Candidates

1. **This paper has _6_ pages and _7__questions for a total of 70 marks.**
2. **You are required to answer all questions.**
3. **You are required to return the question script.**

Key Examination Protocol

1. Students please note that academic dishonesty (or cheating) includes but is not limited to plagiarism, collusion, falsification, replication, taking unauthorised notes or devices into an examination, obtaining an unauthorised copy of the examination paper, communicating or trying to communicate with another candidate during the examination, and being a party to impersonation in relation to an examination.
2. The above mentioned and any other actions which compromise the integrity of the academic evaluation process will be fully investigated and addressed in accordance with UTT's academic regulations.
3. Please be reminded that speaking without the Invigilator's permission is **NOT** allowed.

1. Write a C program to determine the total number of occurrences of the letters g and d in a sentence. The input consists of a sentence which is made up of alphabet characters and spaces only and which terminates with a period. Note that the letters g and d may be in either uppercase of lowercase.

[10 marks]

2. Determine and state the output when the following segments of code are executed:

i.
```
a = 6;  b = 7;
if (a < 5 || b > 10)
        p = a + b;
else
        p = a * b;
printf ("p = %d", p);
```
[2 marks]

ii.
```
a = 35;  b = 4;
if ( !(a + b == 10))
        p = a * 1.0 /b;
else
        p = a - b;
printf ("p = %d", p);
```
[2 marks]

iii.
```
int x  =  9;
int y = 4;
double  r ;
r  =  x / y;
printf ("r = %f", r);
```
[2 marks]

iv.
```
int x  =  16;
int y = 5;
int  q ;
q = ( x * y  +  x % y ) / 3;
printf ("q = %d", q);
```
[2 marks]

Total: [8 marks]

3. The following segments of code have some common errors. Rewrite the code without the errors.

i.
```
double length;
printf_s ("Enter the length of the item: ");
scanF_s ("%d", length);
printf_s ("The Length = %.2lf \n\n", Length);
```
[3 marks]

ii.
```
if (a = b);          //check to see if a is equal to b.
printf_s ("a is equal to b.");
```
[2 marks]

iii.
```
if  ! (a > b)        //check to see if a is not greater than b.
Printf_s (a is not greater than b.);
```
[3 marks]

Total: [8 marks]

4. What would be the output from the following program:

```
#include <stdio.h>

void main()
{
        int a = -5, x = 2, y;
        while (x <= 10)
        {
                y = 5;
                while (y <= 12)
                {
                        a += 4;
                        y += 3;
                }
                x += 4;
        }
        printf ("%d \n", a);
}
```

Total: [10 marks]

5. The following Series may be used to calculate *f(x)*, that is, a function of *x*.

$$f(x) = \frac{x}{2} - \frac{2x^2}{3} + \frac{3x^3}{4} - \frac{4x^4}{5} + \ldots$$

Write a C program to input a value of *x* and to determine *f(x)* using the above expansion to 50 terms.

Total: [10 marks]

6. UTT would like you to develop a program to pay its contractors who worked at the various UTT campuses in a given month. A contractor might have worked at one or more of the campuses. The following are the rates paid to the contractors for work done at the various campuses:

Campus	**Hourly Rate of Pay**
Pt. *Lisas (P)*	*27.40*
O'Meara (O)	*21.45*
Chaguaramas (G)	*33.95*
Barataria (B)	*15.40*
Wallerfield (W)	*55.30*
Mayaro(M)	*20.65*

Your program must accept as input a contractor's identification (id) in the form of an integer. After entering the id for a contractor, your procedure should then read in the campus (single character) followed by the hours worked at that campus. The program should calculate the amount payable for to the contractor for that campus. **Use a switch statement in your program to accomplish this.**

The contractor might have worked at more than one campus. Your procedure should therefore ask if there are any more inputs for this contractor. If the response is Y (for Yes), then your procedure should ask for the name of the next campus followed by the hours worked. This process should continue until the response is N, indicating that there are no more campuses that the contractor worked at. After processing all the inputs for a given contractor, your procedure should output the contractor's id along with the total amount payable to him.

After processing all the data for one contractor, your procedure should ask if there are any more contractors to be processed. Continue the above process as long as the response to this question is Y.

Even though uppercase characters are used above for the inputs of campuses and responses Y or N, your program must be able to handle these inputs in either uppercase or lowercase. Also, your program must validate these responses.

Total: [14 marks]

7. Write a C program to accept as input the identification (id) and number of votes received by each of 20 candidates in an election. The program should then output the id of each candidate, the number of votes that he received and the percentage of the total votes in a format similar to the following (ignore the box):

Candidate	Number of Votes	Percentage
2954	653	59
3971	482	52
.	.	.

Total: [10 marks]

END of Question Paper!