



THE OPEN UNIVERSITY OF SRI LANKA

B.Sc. DEGREE PROGRAMME: LEVEL 03

FINAL EXAMINATION: 2012/2013

CPU1141/ CSU1180: INTRODUCTION TO COMPUTER PROGRAMMING /  
PROGRAMMING PERSPECTIVES & LANGUAGES

DURATION: TWO HOURS (2 HOURS)

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Date: 18<sup>th</sup> June, 2013

Time: 1.00p.m. – 3.00p.m.

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Answer **FOUR** questions **ONLY**

Q1.

- i. What are the rules we have to consider when naming a Pascal program?
- ii. What are the differences between the **Repeat Until loop** and **While loop** in Pascal programming language.
- iii. Briefly explain the following Pascal operator types.
  - i. Relational Operators.
  - ii. Logical Operators.
- iv. Briefly explain the **Global variables** and **Local variables** in context of Pascal language.
- v. Write the outputs of the programs given below.

a. var    x,y:INTEGER;  
       x:=20;  
       y:= x % 3 \* 5 % 2;  
       writeln('Y is :',y);

b. var    value : INTEGER;  
       value:=2;  
       while(value <=1000)  
       value := value\*2;  
       writeln('Value is :',value);

vi. Convert the following Pascal program in to C programming Language.

```
PROGRAM Circle;
VAR
    radius :REAL;
    value:INTEGER;

CONST
    PI=3.141;

PROCEDURE PRINTMENUE;
BEGIN
    WRITELN('1. CIRCUMFERENCE');
    WRITELN('2. AREA');
    WRITELN('3. BOTH');
END;

BEGIN
    WRITELN('Enter value of radius');
    READLN(radius);
    WRITELN('Select your preference');
    WRITELN("");

    PRINTMENUE;
    READLN(value);
END.
```

Q2.

- i. A certain factory pays salaries for their workers in terms of number of items they produce per month. For the first hundred items, they pay Rs. 75/= per item. For the next fifty items, Rs 100/= per item and for the remaining items, Rs 150/= per item. Write a complete C program (using **if else statements**) read the number of items produced by employee, calculate and print the salary of the employee.

- ii. Write a complete C program
- a. To display the following menu.

**Select Your Character**

**M or m :Mango**  
**A or a :Apple**  
**O or o :Orange**  
**P or p :Papaw**  
**B or b :Banana**

- b. Get the choice of the menu when user gives “M or m” print Mango, “A or a” print Apple, “O or o” print Orange, “P or p” print Papaw, “B or b” print Banana. According to the selected choice, print the name of the relevant fruit using a **switch case statement**.

Q3.

- i. Write the outputs of the programs given below.

a. `#include <stdio.h>`  
`int main()`  
`{`  
`int i=10, j=20;`  
`while ( i ? --i : j++)`  
`{`  
`printf(“i=%d j=%d ”, i, j);`  
`}`  
`}`

b. `#include <stdio.h>`  
`int main()`  
`{`  
`int x;`  
`for(x = 1; x <= 3; x++)`  
`{`  
`printf(“BYE \n”);`  
`}`  
`printf(“%d” , x);`  
`}`

- ii. Write a C program that prints the following shape using **nested for loops**.

```
*
**
***
****
*****
*****
****
***
**
*
```

- iii. Write a C program by using the **while loop** to read a set of numbers and to calculate the total of them. The program should terminate when any negative number is read.

Q4.

- i. a. What are the four storage classes in C programming language?  
b. Briefly explain their Storage, Default initial value and Scope.
- ii. How does **calloc()** function differ from **malloc()** function?
- iii. What is the use of **free()** function in memory allocation?
- iv. Determine whether the following statements are true or false.
- a. “float 2nd\_val ;” is a valid identifier in C language.
- b. scanf ( ) function can be used to read the string “Hasitha Silva”.
- c. A “char” variable can store an ASCII character.
- d. 

```
# include<stdio.h>
int main(){
    int j, i = 2;
    j= 3 + 2 * i++;
    printf(“%d”, j);
}
```

The output of above program is 9.

- e. 

```
# include<stdio.h>
int main(){
    int num1, num2 = 6;
    num1= - num2-- + ++num2;
    printf(“%d”,num1);
}
```

The output of above program is 0.

Q5.

Write down a complete C program that performs the following task.

- i. Define an array called “grades” of size 10 and of type integer and another array called “names” to store student names for 10 students (assume maximum length for name is 9 characters).
- ii. Read 10 different values of grades and names into the two arrays using function “scanf ( )”. The reading process should be done using loops. The values of grade should be in the range of 0 to 100 inclusive.
- iii. Calculate the average of the grades.
- iv. Calculate the highest grade and display the name of the person who has the highest grade.

Q6.

- i. Using C programming construct the function prototypes that match the following descriptions.
  - a. addFunction ( ) takes no arguments and has no return types.
  - b. multiFunction ( ) takes an integer argument and no return values.
  - c. divFunction ( ) takes two integer arguments and return a integer value.
- ii. Determine whether the following statements are true or false, in the context of C programming.
  - a. Functions can return more than one value at a time.
  - b. A Function can be defined inside another function.
  - c. Functions can be defined by using same name, same return type and different arguments.
  - d. A Structure can be nested inside another structure.
  - e. A union cannot be nested in a Structure.
  - f. Size of union is size of the largest element in the union.
  - g. Arrays, Structures, and Unions are user defined data types.

h. 

```
# include<stdio.h>
int main( )
{
    union v
    {
        int a,b;
    };
    union v cal;
    cal.a=50;
    cal.b=10;
    printf(“%d \n”,cal.a);
return 0;
}
```

**The output of above program is 10.**

- iii. Write a complete C program to read the two numbers, **swap** (interchange) them and print the numbers. Your program should use a function to interchange two variables using **pass by address** method.

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