

The Open University of Sri Lanka
Faculty of Natural Sciences
B.Sc/ B. Ed Degree Programme



Department	: Computer Science
Level	: 03
Name of the Examination	: Final Examination (1st Semester)
Course Title and - Code	: Introduction to Computer Programming - CSU 3200
Academic Year	: 2020/2021
Date	: 22.12.2021
Time	: 1.30 pm -3.30 pm
Duration	: Two hours only

General Instructions

1. Read all instructions carefully before answering the questions.
 2. This question paper consists of **(06)** questions in **(08)** pages.
 3. Answer any **(04)** questions only. All questions carry equal marks.
 4. Answer for each question should commence from a new page.
 5. Draw fully labelled diagrams where necessary
 6. Involvement in any activity that is considered as an exam offense will lead to punishment
 7. Use blue or black ink to answer the questions.
 8. Clearly state your index number in your answer script
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Question 1.

A) Fill in the blanks using the suitable words provided below.

(five, symbol, colon, Low, ternary, semicolon, High, case, unary, variables, four, const, compiler, main, interpreter, getchar)

- I) A C program is converted in to machine language with the help of
- II) Every C program must have at least one function called as function.
- III) In C language, a variable name cannot start with a other than an underscore or a letter.
- IV) C language provides you with Dynamic Memory Allocation functions to allocate memory spaces while your program is running.
- V) Each statement in C Language end with a
- VI) C programming language is sensitive.
- VII) There are fundamental data types in C language.
- VIII) The function reads a single character from a standard input device typically a keyboard.
- IX) The keyword is used to declare a variable as a constant in C.
- X) Increment and Decrement operators can only be applied to, not in expressions.

(10 Marks)

B) Describe the following functions.

I) getchar()

(2 Marks)

II) putchar()

(2 Marks)

C) What will be the output of the following program? (Assume there is a file called "hello.txt" in your default directory).

```
#include <stdio.h>
int main(){
    FILE *my_file;
    my_file = fopen("hello.txt", "w");
    {
        fputs("Introduction to Computer Programming", my_file) ;
        puts("String written to the file successfully...");
    }
    fclose(file);
    return 0;
}
```

(6 Marks)

D) What is the output of the following program?

```
#include <stdio.h>
#include <string.h>

int main()
{
    struct course
    {
        int credits;
        char name[10];
    } course1, course2 = {2, "CSU3200"};

    course1.credits = course2.credits+1;
    strcpy(course1.name, "C Programming");
    printf("Course 1 : %s \n Credits = %d", course1.name, course1.credits);
    return 0;
}
```

(5 Marks)

Question 2.

A) Briefly describe the difference between a variable and a constant.

(4 Marks)

B) What will be the output of the following program?

```
#include <stdio.h>
int main()
{
    int y = 10;
    y = y++ + 2 + ++y;
    printf("Y = %d\n", y);
    y = ++y + 2 + y++;
    printf("Y = %d", y);
    return 0;
}
```

(5 Marks)

C) State the three logical operators in C language.

(3 Marks)

D) Briefly explain the following file opening modes.

- a. "r"
- b. "w"
- c. "rb"

(3 Marks)

- E) Meteorological department collects the daily rainfall measures throughout the island from nearly 100 places. Using these data, they needed to find the place with the highest rainfall. You have been asked to write a complete C program to find out the highest rainfall among all the data. You are advised to use an array to input data.

(10 Marks)

Question 3

- A) Explain the following.

I) What do you mean by Dynamic Memory Allocation?

(2 Marks)

II) State four Dynamic Memory Allocation functions.

(4 Marks)

- B) State whether each of the following statements are true or false.

```
int c;
int *pc;
pc = &c;
```

I) pc = c;

II) *pc = &c;

III) pc = &c;

IV) *pc = c;

(4 Marks)

- C) What is the output of the following program?

```
#include <stdio.h>
int sum (int n);

void main()
{
    int a = 5, b;
    printf("a = %d", a);
    a = sum(a);
    printf("\n a = %d", a);
    b = sum(a);
    printf("\n b = %d", a);
}

int sum (int n)
{
    n = n + 20;
    printf("\n a = %d", n);
    return n;
}
```

(5 Marks)

- D) Briefly explain the following prototype statement of a function.

float getVolume (int a, float y, float z);

(4 Marks)

E) Write appropriate Input function statements in C language for the following requirements.

- a. To read an age of a student from the keyboard
- b. To read monthly salary of an employee from the keyboard
- c. To read a character to get a gender of a person from the keyboard

(6 Marks)

Question 4.

A) Answer the following.

I. State the syntax of 'while' loop and 'do-while' loop in C language.

(4 Marks)

II. What is the difference between the above two loops?

(1 Marks)

B) What are the four types of errors in C programming?

(4 Marks)

C) What is the output of the following program?

```
#include<stdio.h>
#include<string.h>

main()
{
char str1[12] ="Open";
char str2[12] ="University";
char str3[12];
int len, result;

strcpy(str3, str1);
printf(" strcpy(str3, str1) : %s\n", str3 );

strcat( str1, str2);
printf("strcat( str1, str2): %s\n", str1 );

len=strlen(str1);
printf("strlen(str1) : %d\n",len);

result = strcmp(str3, str2);
printf("strcmp(str3, str2) : %d", result);
}
```

(4 Marks)

D) What are the four storage classes?

(4 Marks)

E) Write a complete C program to check whether the given year is a leap year or not. You have to input the year from the keyboard while running the program.

(8 Marks)

Question 5

A) What is the output of the following program?

```
#include <stdio.h>
int main()
{
    union employee
    {
        int start_year;
        int dept_code;
        int id_number;
    };
    union employee info;

    info.start_year = 2020;
    info.dept_code = 8;
    info.id_number = 1234;

    printf("Start year : %d", info.start_year);
    printf("\nDepartment code : %d", info.dept_code);
    printf("\nID Number : %d", info.id_number);

    return 0;
}
```

(3 Marks)

B) Mention the name of function that could be used in the following situations.

- I. To write one character at a time to a text file
- II. To read a sentence from the keyboard
- III. To release the memory spaces, allocated using any dynamic memory allocation function
- IV. To terminate a case in the switch statement or to force immediate termination of a loop
- V. To close a file

(5 Marks)

C) Suppose you want to store data about employees of a department. You want to store employee name (a string), employee age (an integer), gender (a character) and basic

salary (with decimal places). Create a structure to hold the above information and then declare a structure type variable.

(4 Marks)

D) State the meaning of each back slash character mention below.

- I. '\n'
- II. '\t'
- III. '\\'
- IV. '\'
- V. '\0'

(5 Marks)

E) Write a complete program to read a number between 1-12. Using switch statement display the name of the month appropriately. (eg: when 12 is input, it should display 'December')

(8 Marks)

Question 6

A) What is a 'file' and what are the two types of files?

(4 Marks)

B) Describe the two methods of constant declaration in C language.

(2 Marks)

C) Convert the following if-else statement into one statement using conditional operator.

```
if (num1 > num2)
    max = num1;
else
    max = num2;
```

(2 Marks)

D) Write down the output of each of the following code segments.

a. `int sum = 0, x = 1;`

```
while (x <= 5)
{
    sum += x;
    x += 1;
}
```

```
printf("sum = %d", sum);
```

c. `int a = 1, b = 7;`
`int i;`

```
for (i=b - a; i <= b + a; i++)
    printf("%d\n", i * i);
```

```
b. char name[20] = "Hello World";
   int i;
   char as = 'Y';

   for (i=0; i <20; i++)
       putchar(name[i]);
   printf("\n");
   puts(name);
printf("\n");
putchar(as);
```

(7 Marks)

E) Write a complete C program to read examination marks of 10 students from the keyboard for CSU3200 subject and display the marks which are greater than 40. Then find the average mark of all students.

(10 Marks)