

University of Sargodha

M. Sc. I. T, First Term Exam 2014

Subject: Information Technology

Paper: Programming Fundamentals (CMP: 2122)

Time Allowed: 2:30 Hour

Maximum Marks: 60

Note: Objective part is compulsory. Attempt any four questions from subjective part.

Objective Part

- Q.1.** Write short answers of the following on your answer sheet. (2*12)
- i. What is the difference between while and do while loops?
 - ii. What is struct keyword in C?
 - iii. Why main function is necessary in each C program?
 - iv. What is the use of compiler in C language?
 - v. Convert following algebraic equation into C expression $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
 - vi. What is flow-chart?
 - vii. What is continue statement?
 - viii. What is function prototype in C?
 - ix. Give 2 dimensional C array declarations of different types.
 - x. What is pass by reference in C? Give suitable example.
 - xi. What is the relationship between C pointers and arrays?
 - xii. What is switch statement?

Subjective Part (9 x 4)

- Q.2.** Develop a C program to sort array of following data: 78, 23, 45, 12, 60, 67, 32.
- Q.3.** Develop a C program to read the temperature of a week on daily basis, and print the temperature in ascending order.
- Q.4.** Develop a C program to calculate the cube value of number given by a user.
- Q.5.** Draw flow-chart and develop a C program to find class average grade with counter controlled repetition.
- Q.6.** Write a function to calculate the factorial of any integer number given by user and use this function into a C program.
- Q.7.** Write a program that has a structure to store Date (day, month, year), create two Date type variables, use these variables to store two dates and display these dates.

Q) Write statement to declare and display string?

Declare → `char name[20];`
`scanf("%s", name);`

Display → `printf("your name is %s", name);`

MSC IT 2014
objective

i) What is difference b/w while and do-while loop?

`while (condition)`

{

statements;

}

- * Condition used in before the statement or body of loop.
- * If condition is false while never execute.
- * Semicolon is not used after the condition.

do-while loop :

do

{

statements;

}

while (condition);

- * Condition come after the body of loop.
- * do-while is executed at least once even if condition is false in the beginning.
- * Semicolon is used after the condition.

ii) What is struct keyword in C?

struct is used to declare a new data-type. Basically this mean grouping variables together.

Example :-

```
struct x {int a; int b; int c};
```

```
struct x {int n};
```

iii) Why main function is necessary in each C language?

The main() function is the place where the execution of a C program starts. When the program is executed, the control enters main() function and starts executing its statements.

Each program must contain main() function. If a program does not contain main function, it can be compiled but cannot be executed.

iv) What is the use of compiler in C language?

Compiler is used to converting source program into object program. The source program cannot be executed by computer directly.

When user written in C program for high level language the compiler convert into low-level-language / machine language.

v) Convert following algebraic equation into C expression

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{(-b + \sqrt{b*b - 4*a*c})}{2*a}$$

$$\frac{(-b - \sqrt{b*b - 4*a*c})}{2*a}$$

vi) What is flow-chart?

- A diagram of the sequence of movements or action of place involved in a complex system or activity.
- A graphical representation of a computer program in relation to its sequence of function.

vii) What is Continue ~~function~~ statement?

The continue statement is used in the body of the loop. It is used to move the control to the start of the ^{loop} body. When this statement is executed in the loop body, the remaining statement of current iteration are not executed. The control directly moves to the next iteration.

Example :-

```
int x;
for (x = 1; x <= 5; x++)
{
    printf("Sohail");
    continue;
    printf("Knowledge is power");
}
```

viii) What is function prototype in C?

See on Page 4:

ix) Give two dimensional C array declaration of different types?

An array of array is known as 2D array.

The two dimensional (2D) array in C

Programming is also known as matrix.

A matrix can be represented as a table

of rows and columns.

Example :-

/* 2D array declaration */

int array [2][3]

rows

columns

x) What is pass by reference in C?
Give suitable example.

Pass by reference / Function call by reference in C. The call by reference method of passing arguments to a function copies the address of an arguments into the formal parameter.

Example :-

```
void swap(int *x, int *y)
{
```

```
    int temp;
```

```
    temp = *x;
```

```
    *x = *y;
```

```
    *y = temp;
```

```
    return 0;
```

```
}
```

xi) What is relationship b/w C pointer and array?

- * Pointer are used for storing address of dynamically allocated arrays.
- * Array are used to passed as arguments to function.
- * Pointer variable can take different addresses as value, whereas in the case of array it is fixed.

xii) What is Switch statement?

The switch statement is a good alternate of nested if-else. It can be used easily when there are many choices available and only one should be executed. The switch construct is useful ~~when~~ in the case where selection is based on the value.

Subjective Part

Q2. Develop a C program to sort array.

```
#include<stdio.h>
int main()
{
    int i,j,a[10],temp;

    printf("enter a number");
    for(i=0; i<=9; i++)
    {
        scanf("%d",&a[i]);
    }

    /*Accendeing order program*/
    for(i=0; i<=9; i++)
    {
        for(j=i+1; j<=9; j++)
        {
            if(a[i]>a[j])
            {
                temp=a[i];
                a[i]=a[j];
                a[j]=temp;
            }
        }
    }
    printf("number in accending order are\n");
    for(i=0; i<=9; i++)
    {
        printf("%d",a[i]);
    }
    printf("\n");
    return 0;
}
```


Q3. Develop a C program to read the temperature of a week of on daily basis, and print the temperature in ascending order.

```
#include<stdio.h>
int main()
{
    int temp[7];
    printf("Enter Temperature of 7 days in order of days\n");
    for(int i=0 ; i<7 ; i++)
    {
        scanf("%d",&temp[i]);
    }
    printf("Enter Temperature of 7 days in Ascending order of days\n\n");
    for(int i=0 ; i<7 ; i++)
    {
        for(int i=0 ; i<6 ; i++)
        {
            if(temp[i]>temp[i+1])
            {
                int tempp;
                tempp=temp[i];
                temp[i] = temp[i+1];
                temp[i+1]=tempp;
            }
        }
    }
    for(int i=0 ; i<7 ; i++)
    {
        printf("%d\n",temp[i]);
    }
}
```

Q4. Develop a C program to calculate the Cube value of number given by user.

```
#include<stdio.h>
int main()
{
    int a;
    printf("enter a number");
    scanf("%d",&a);
    printf("%d \t %d\n",a,a*a*a);
    return 0;
}
```

Q5. Draw a flow chart and develop a C program to find class average grade with counter control repetition.

I Don't Know

Q6. Write a function to calculate a factorial of any integer number given by user and use this function into C program.

```
#include<stdio.h>
int factorial(int);
int main()
{
    int n;
    int f;
    printf("Enter an integer to find its factorial\n");
    scanf("%d", &n);

    if (n < 0)
        printf("Factorial of negative integers isn't defined.\n");
    else
    {
        f = factorial(n);
        printf("%d! = %d\n", n, f);
    }

    return 0;
}

int factorial(int n)
{
    if (n == 0)
        return 1;
    else
        return(n * factorial(n-1));
}
```

Q7. Write a program that has a structure to store data (Day, Month, Year), create two Data type variable, use these variable to store dates and display these dates.

```
#include<stdio.h>
#include<conio.h>
struct Date
{
    int day;
    int month;
    int year;
};
int main()
{
    Date d1 , d2;
    printf("Enter day");
    scanf("%d",&d1.day);
    printf("Enter month");
    scanf("%d",&d1.month);
    printf("Enter year");
    scanf("%d",&d1.year);
    printf("\n");
    printf("Enter day");
    scanf("%d",&d2.day);
    printf("Enter month");
    scanf("%d",&d2.month);
    printf("Enter year");
    scanf("%d",&d2.year);

    printf("%d %d %d\n",d1.day,d1.month,d1.year);
    printf("%d %d %d",d2.day,d2.month,d2.year);
}
```

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