

BITS PILANI, DUBAI CAMPUS

FIRST SEMESTER 2012- 2013

Course Code: CS F111
Course Title: Computer Programming
Duration: 3 hours

I YEAR

Date: 06.1.2013
Max Marks: 60
Weightage: 30%

Comprehensive Examination

Note: Answer Parts A, B and C in separate booklets provided. Do not use calculators.

Part – A

1. Write a C program to calculate the income tax of the employees in an organization where the conditions are given as:

(I.T = 0, if income < 100000
I.T = 10%, if income < 200000
I.T = 20%, if income > 200000)

Use three separate functions for reading employee details, calculating income tax and displaying the results. Main program should contain only function calls. **4M**

2. Write a C program that takes two positive integers from user and displays all prime numbers between those intervals. Use a function to check whether a number is prime or not.

Eg: 10, 30 (11, 13, 17, 19, 23, 29) **4M**

3. Write a C program to sort an unsorted array using **selection** sort. **4M**

4. Trace the detailed working of **binary search** for the given array. Search for the element 64. (Program is not required). **4M**

10, 15, 24, 36, 45, 55, 64, 73, 90, 98

5. What will be the output of the programs? **(2 * 2 = 4M)**

a. `#include<stdio.h>`
`int reverse(int);`

```
int main()
{
    int no = 5;
    reverse(no);
    return 0;
}
```

```
int reverse(int no)
{
    if (no == 0)
        return 0;
    else
```

```

printf("%d", no);
reverse(no--);
}

```

b. #include<stdio.h>

```

int main()
{
    int fun(int);
    int i = fun(10);
    printf("%d\n", --i);
    return 0;
}

int fun(int i)
{
    return (i++);
}

```

Part – B

1. Write a c code for accepting a string (with spaces) from user and then print the following pattern of the same string. **6M**

Ex. 1

Ex. 2

Enter a string:

Enter a string:

My name is khan

Madan Mohan Krishna

The pattern printed is

The pattern printed is

```

N
An
Han
Khan
khan
S khan
Is khan
is khan
E is khan
Me is khan
Ame is khan
Name is khan
name is khan
Y name is khan
My name is khan

```

```

A
Na
Hna
Shna
Ishna
Krishna
krishna
N Krishna
An Krishna
Han Krishna
Ohan Krishna
Mohan Krishna
Mohan Krishna
N Mohan Krishna
An Mohan Krishna
Dan Mohan Krishna
Adan Mohan Krishna
Madan Mohan Krishna

```

2. Convert the following decimal numbers to

- 1's Complement binary form
- 2's Complement binary form

i) -253 (use 10 bits)

ii) 67 (use 8 bits)

3M+1M

3. Rewrite the following program using "switch" statement

```
main()
{
    char ch;
    scanf("%c",&ch);
    if(ch=='A')
        printf("Apple\n");
    else if(ch=='E')
        printf("Elephant\n");
    else if(ch=='I')
        printf("Intel\n");
    else
        printf("Microsoft\n");
}
```

3M

4. To play any game there will be different teams. Each team will have team id & team name. There will be players in each team. A player will have attributes like player id, name, scores, average etc. The team id and player id combination will be the play list of the team. Write the structure definitions for at least 100 players, 1000 plays and 10 teams.

3M

5. What will be the output of the following code segments?

i)

```
main()
{
    char *a, arr[5][10]={"Hello","How r u","I m f9","thank u","how abt u"};
    a=arr;
    a++;
    printf("%s",arr[2]);
}
```

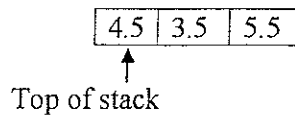
ii)

```
main()
{
    int i=2,j=3;
    switch(j,i){
    case(3,2): printf("CP32\n");
    case(3,3): printf("CP33\n");
    default: if(j==3) printf("CP\n");
    case(1,2): printf("CP12\n"); break;
    case(2,1): printf("CP21\n");
    }
```

Part – C

1. Write a program to create a linked list of five elements, where each element contains the name of the city and the country to which it belongs. Write a function to display this linked list. **4M + 2M**

2. a. Consider a stack which contains three elements 4.5, 3.5, 5.5. Show the status of the stack diagrammatically after each of the following instructions push(7.5), push(9.5), pop(), pop() instructions are executed. Show separate diagrams for executing each instruction.



b. Consider the above question to be a queue instead of a stack, show the status of the queue after executing each instruction add(7.5), add(9.5), delete(), delete(). **2M + 2 M**

3. Consider a file maintained by Toyota company where they store information about all models of their cars. The details include model_no, make, year of manufacture, color and type(e.g. sedan, 4wheel, coupe etc.) and cost. Now Toyota would like to store information about all Camry cars manufactured in 2011 in a new file called **RECALL** because they would like to recall all these vehicles due to a technical glitch. read the file which contains information about all the cars from the file call **ALL** and store information about Camry cars manufactured in 2011 in the new file called **RECALL**. **4M**

4. Write a program to print the sum of the elements of an array of size 10 integers using pointers to access the individual elements of the array. Create space for the array using Dynamic memory Allocation. **3M**

5. Write a recursive function to reverse a string. **3M**

******END******

BITS PILANI, DUBAI CAMPUS
FIRST SEMESTER 2012- 2013

Course Code: CS F111
Course Title: Computer Programming
Duration: 50 minutes

I YEAR

Date: 09.12.2012
Max Marks: 40
Weightage: 20%

Test – II (Open Book)

Note: Only prescribed text book and handwritten class notes are allowed

- 1. What will be the output of the program? Explain your answer.**

3M

```
#include<stdio.h>
int i;
int fun();

int main()
{
    while(i)
    {
        fun();
        main();
    }
    printf("Hello\n");
    return 0;
}

int fun()
{
    printf("Hi");
}
```

- 2. Point out the error in the program.**

2M

```
#include<stdio.h>
int f(int a)
{
    a > 20? return(10): return(20);
}

int main()
{
    int f(int);
    int b;
    b = f(20);
    printf("%d\n", b);
    return 0;
}
```

- 3. Write a C program to find the largest and smallest element of an m by n matrix using functions. Provide separate functions for reading a matrix, calculating largest and smallest element. The main function should have only function calls.**

8M

4. Read the following scenario

"Emirates Identity Authority (EIDA) in UAE has decided to issue a identity card (EIDA card) for every resident of UAE. To uniquely identify every resident the authority has found the residents' attributes like EIDA ID No, the name of the resident, nationality, gender, DOB etc."

Write a C program using structures to hold at least 1000 residents information. Add at least 2 resident's details. **6M**

5. What will be the output for the following code segment? **2M**

```
union shape
{
    int circle;
    char triangle;
    char rectangle[15];
};
main()
{
    union shape s;
    s.circle=15;
    strcpy(s.rectangle,"BITS Pilani");
    printf("%d\t%s\n",s.circle,s.rectangle);
}
```

6. For the following unsorted array, show the steps for bubble sort. **5M**

3, 68, 10, 13, 7, 2, 6, 1

7. Write a C program to input a M * M matrix in the main function and write a function swap() which swaps the diagonals as shown in the example and print the matrix. **7M**

If the matrix is	1	2	3	4	the new matrix is	4	2	3	1
	4	3	2	1		4	2	3	1
	5	2	8	3		5	8	2	3
	2	8	9	2		2	8	9	2

8. Write a program to read a string, delete all the spaces in the string, store the string and display the final string.

e.g. Sample I/P **I LIKE WINTER**
Sample O/P **ILIKEWINTER**

7M

******END******

Term 2

BITS PILANI, DUBAI CAMPUS
FIRST SEMESTER 2012- 2013

Course Code: CS F111
Course Title: Computer Programming
Duration: 50 minutes

I YEAR

Date: 18.10.2012
Max Marks: 40
Weightage: 20%

Note: Calculators are not allowed.

1. Draw the basic building blocks of computer. **1M**

2. Consider the arithmetic expression

$$i = a * b / c + c / c + d - a + e / d$$

where a, b, c, d and e are integer variables. If these variables are assigned the values 2, 3, 4, 8 and 5 respectively, then evaluate i. (Show stepwise evaluation)

4M

3. Evaluate i, if j has been assigned a value of 5. Both i and j are integer variables.

2M

(i) $i = 2 * j / 2$

(ii) $i = 2 * (j / 2)$

4. Evaluate j, if i and j are assigned values 5 and 7. Both i and j are integer variables.

1M

$$j *= (i-3)$$

5. What will be the output of the following printf statement?

3M

```
printf("%c %3d %3.2f %0.2f %s %-2d", '5', 786, 3.14159, 2.717, "apple", 654);
```

6.

a) Consider the code:

1.5M+1.5M

```
float a = 5.25;
```

```
int b = (int)a;
```

What is the value of b?

b) Consider the code:

```
char c = 'A';
```

```
int x = (int)c;
```

What is the value of x, if ascii value of A is 65?

7. Convert the given decimal number $(743)_{10}$ to its equivalent Octal and Hexadecimal representation.

2M+2M

8. Give the output of the following program.

3M

```
#include<stdio.h>
main()
{
int digit;
for(digit=0;digit<=9;digit++)
printf("%d",digit);
digit = 5 * digit;
printf("\n%d",digit);
--digit;
printf("\n%d",digit);
}
```

9. Represent the decimal number $(-89)_{10}$ in binary using 8 bit representation in

- i) Signed Magnitude representation
- ii) Two's complement representation

2M+2M

10. Predict the output of the following program given that the ASCII value of 'a' is 97.

2M

```
#include<stdio.h>
main()
{
    int a;
    a='a';
    a>40 ? printf("tea please"):printf("coffee please");
    a+=a;
    printf("%d",a);
}
```

11. Write a C program to print the following pattern using loops and conditional statements. (Pattern size should be accepted from the user.)

9M

If user input is 4	If user input is 7
0 0	0 0
1 0 0 1	1 0 0 1
2 1 0 0 1 2	2 1 0 0 1 2
3 2 1 0 0 1 2 3	3 2 1 0 0 1 2 3
4 3 2 1 0 1 2 3 4	4 3 2 1 0 0 1 2 3 4
	5 4 3 2 1 0 0 1 2 3 4 5
	6 5 4 3 2 1 0 0 1 2 3 4 5 6
	7 6 5 4 3 2 1 0 1 2 3 4 5 6 7

12. What will be the output of the following code segment?

2M+2M

<p>(i) main()</p> <pre>{ int i=5,j; j=(i++)+i; if(j=i) printf("%d %d",i,j); else printf("%d %d",i,j); }</pre>	<p>(ii) main()</p> <pre>{ int a=2; switch(a) { case 1: printf("One"); case 2: printf("Two"); case 3: printf("Three"); Default: printf("Invalid"); } }</pre>
--	--

END

qw3-1

**BITS PILANI, DUBAI CAMPUS
FIRST SEMESTER 2012- 2013**

**Course Code: CS F111
Course Title: Computer Programming
Duration: 20 minutes**

I YEAR

**Date: 08.11.2012
Max Marks: 10
Weightage: 5%**

Version - A

Name: _____ ID: _____ Sec: _____ Faculty: _____

1. What will be the output of the following program?

1M

```
#include<stdio.h>
main()
{
    int num[26], temp;

    num[0] = 100;
    num[25] = 200;

    temp = num[25];
    num[25] = num[0];
    num[0] = temp;

    printf("\n%d%d", num[0],num[25]);
}
```

2. What will be the output of the following program?

1M

```
main()
{
    char arr[7] = "Network";
    printf("%s",arr);
}
```

3. An array must be accessed using which of the following options.

1M

- a. First in first out approach
- b. Dot operator
- c. Element name
- d. Index operator

4. Write a C statement to define a string called dextrose that has a value C6H12O-H2O.

1M

5. The elements of a 20 element array are indexed from _____ to _____

2M

6. Determine the total bytes required to store B[17] as a character array.

1M

7. What will be the output of the following program?

1M

```
#include<stdio.h>
int main()
{
    int a[5] = {5, 1, 15, 20, 25};
    int i, j, m;

    i = ++a[1];
    j = a[1]++;
    m = a[i++];
    printf("%d, %d, %d", i, j, m);
    return 0;
}
```

8. What will be the output of the following program?

1M

```
main()
{
    int i,j=5,k;
    for(i=0;i<j;i++);
    k=i+j;
    printf("%d",k);
}
```

9. Give the output of the following code.

1M

```
main()
{
    int stock = { 10,22,15,12,18};
    int total = 0, i;

    for( i=0;i<5;i++)
        if(stock[i] >15)
            total+= stock[i];
    printf("Total = %d", total);
}
```