

BITS PILANI – DUBAI
International Academic City, Dubai
Second Semester 2009 – 2010
Computer Programming - I TA C162 (I year)
Comprehensive Examination(Closed Book)

No. of Sections : A, B No. of Pages : 5
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Duration : 3 hours
19.05.2010

Weightage : 40%
MAX : 120 Marks

Note:

1. **Answer PART A and PART B in two separate answer books.**
2. Answer the questions sequentially, questions answered out of sequence will not be evaluated.
3. Do not write full program unless asked for in the question.

PART – A

1. Write the formatted Output for the following printf statements

5M

If y = 89.4567,
1) printf(“%7.4f”, y);
2) printf(“%7.2f”, y);
3) printf(“%-7.2f”, y);
4) printf(“%f”, y);

If y = NEW DELHI 110001
5)printf(“%5s”, y);
6)printf(“%-20.10s”, y);
7)printf(“%.5s”, y);
8)printf(“%20.10s”, y);
9)printf(“%s”, y);
10)printf(“%20s”, y);

- 2.What would be the output of the following

3M

```
a) main()  
{  
    int i=2, j=3, k, l;  
    float a, b;  
    k = i/j*j;  
    l = j/i*i;  
    a = i/j*j;  
    b = j/i*i;  
    printf(“%d %d %f %f”,k,l,a,b);  
}
```

```
b) main()  
{  
    int a, b;
```

```
float a, b;
a = -3 - -3;
b = -3 - -(-3);
printf("a=%d b=%d ",a,b);
}
```

```
c)main( )
{
printf(" n n \n \n n n \n");
printf(" n n /n /n n n /n");
}
```

3. Evaluate the following expressions and show their hierarchy

3M

a) $g = \text{big}/2 + \text{big} * 4 / \text{big} - \text{big} + \text{abc}/3$;
($\text{abc} = 2.5$, $\text{big} = 2$, assume g to be a float)

b) $s = \text{qui} * \text{add} / 4 - 6/2 + 2/3 * 6/\text{GOD}$;
($\text{qui} = 4$, $\text{add} = 2$, $\text{GOD} = 2$, assume s to be an int)

4. What would be the output of the following

1M

```
a)main( )
{
int a=5, b, c;
b = a = 15;
c = a<15;
printf("a=%d b=%d c=%d",a, b, c);
}
```

```
b)main( )
{
int x = 15;
printf("%d %d %d",x!=15,x=20,x<30);
}
```

1M

```
c)main ( )
{
int x = 4, y = 0, z;
while (x>=0)
{
if(x == y)
break;
else
printf(" %d %d",x,y);
x --;
y ++;
}
```

3M

```
}
```

```
d)main ( )
{
int i = 1, j = 1;
for(;;)
{
if(i>5)
break ;
else
j +=i;
printf(" %d ",j);
i += j;
}
}
```

3M

5. Write a program to produce the following output

6M

```
A B C D E F G F E D C B A
A B C D E F   F E D C B A
A B C D E     E D C B A
A B C D       D C B A
A B C         C B A
A B           B A
A             A
```

6. Is it a good practice to use goto statements in programs? If not, why should goto be avoided? Mention other constructs instead of goto.

3M

7. Every Statement in a SWITCH must belong to some case. What happens if a statement does not belong to any case? What happens if there is no Default case?

3M

8. Write a program to do the following operations on a given text

10M

a) to find the number of words in a given text

b) to reverse each word in the text

c) input a string to the last word, and concatenate the two to make the last word of the text

9. Can an Array of Pointers to strings be used to collect strings from the keyboard?

If not, why not?

4M

10. Write the instruction encoding for LD R7, x1EE, if the contents of the incremented program counter is 0000 0000 0001 1001, Find the address for loading the data 1110 0001 1110 1111 into R7. Draw the relevant data path diagram

7M

11. Write the instruction encoding for LDR R0, R5, #10,
 Draw the Data path Diagram, if the contents of the incremented program counter is
 0000 0111 0000 0000 and 0F0F is present in R0, hexadecimal address x2385 is
 present in R5, 0F0F present in x2382 8 M

PART – B

1. If the last digit of a 2's complement binary number is 0, then the number is even.
 If the last two digits of a 2's complement binary number are 00 (e.g. the binary
 number 01100), what does that tell you about the number? 2 M
2. What is the decimal equivalent of the following binary 2's complement number
 11100110 4 M
3. What is the least number of bits needed to have a unique bit pattern for each of the 26
 alphabets in English? How many minimum number of bits are needed to distinguish
 between upper and lower case alphabets? 2 M
4. Implement the following functions using AND, OR and NOT logical operations and
 draw the respective truth tables. The inputs are A, B and the output is F.
 a) F has the value 1 only if A has the value 0 and B has the value 1.
 b) F has the value 1 only if A has the value 1 and B has the value 0. 2 x 2 = 4M
5. For a 4-input multiplexer, write the number of control lines and draw the gate level
 diagram. 2 + 4 = 6 M
6. Complete the following truth table of an RS latch, where S, R are inputs and a is the
 value stored in the latch. 4 M

S	R	a
1	1	
1	0	
0	1	
0	0	

7. Suppose a 32 – bit instruction has the following format:

OPCODE	SR	DR	IMM
--------	----	----	-----

where SR is source register, DR is destination register and IMM is the 2's
 complement immediate data. If there are 60 opcodes and 32 registers, what are the
 maximum and minimum values that IMM can take? 4 M

8. What does the following program do? What value will be contained in RESULT
 after the program runs to completion? 4 M

```

                .ORIG      x3000
                LD         R2, ZERO
                LD         R0, M0
                LD         R1, M1
LOOP           BRz        DONE
                ADD        R2, R2, R0
                ADD        R1, R1, -1
                BRnzp      LOOP
DONE          ST         R2, RESULT
                HALT

RESULT        .FILL      x0000
ZERO          .FILL      x0000
M0            .FILL      x0004
M1            .FILL      x0003
                .END

```

9. **A** and **B** are two one dimensional arrays of size **m** and **n** respectively. The elements of both the arrays are sorted into ascending order and has no duplicates. Write a program to merge the contents of these two arrays into an array **C** such that the elements of the array **C** will also be in ascending order.

[NOTE : Do not copy the elements of both the arrays **A** and **B** into **C**, and then sort the **C** array. Instead, elements of **A** and **B** should be simultaneously merged and sorted into **C** array]

Ex : **A** array : 2 4 6 8

B array : 1 3 5 7 9 10 14

Merged **C** array should be : 1 2 3 4 5 6 7 8 9 10 14
10 M

10. Write a program to print the following pattern of numbers up to a given value **n**. The program should use a function **print_pattern()** which takes **n** as the parameter, and prints the following pattern.

```

1
2 3
4 5 6
7 8 9 10
11 12 ..... 15
.....
.....
.....
79 .....91

```

10 M

11. Write a program that compares two equal sized arrays **A** and **B** to see whether they are identical or not. The arrays should be compared using their respective pointers. The program should print 1 if they are identical, or 0 otherwise. 10M

***** Best of Luck*****

BITS PILANI – DUBAI
International Academic City, Dubai
Second Semester 2009 – 2010
Computer Programming - I TA C162 (I year)
Test 2(Open Book)

No. of Sections : A,B No. of Pages : 3

Duration : 50 mins
Date : 08.04.2010

Weightage : 20%
MAX : 60 Marks

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- Note:** 1. Answer the questions sequentially, questions answered out of sequence will not be evaluated.
2. Do not write full program unless asked for in the question.
-

PART – A

1. Assume **s1** and **s2** are strings of size defined by the symbolic constant, **SIZE**.
Write an if .. else statement which would concatenate string **s2** to string **s1** if there is no overflow, otherwise concatenates only as much of **s2** that would fit into **s1**.
6 M

2. Given the following declarations 3 x 3 = 9 M

char first[18] = "BITS PILANI-DUBAI";
char s[10];

Write a single statement for assigning each of the following substrings of the string **first** to **s**.
 - a. Assign the substring **DUBAI** to string **s**.
 - b. Assign the substring **PILANI** to string **s**
 - c. Assign the substring **BITS** to string **s**.

3. The string compare function **strcmp()**, is case sensitive. Write a program which reads two strings and compares them irrespective of case (i.e, not case sensitive.)
Example : if string1 is "GooD" and string2 is "gOod", the program should print that the strings are equal, otherwise it should print that they are unequal. 8 M

4. Write a program which uses a function **sum_average()** to find the sum and average of an array of **n** integers. [**Note** : Program should read necessary inputs, output should be from main(). The function should be called with the array as the input argument] 7 M

PART - B

1. Write a program to read a string and sort its contents into alphabetical order.

Example: If the string is "STRING", then in alphabetical order its contents should be "GINRST". 6 M

2. Write a program to multiply 2 matrices **A** and **B** of order **m x n** and **n x p**. 6 M

3. When an array name with no subscript appears in the argument list of a function, what gets stored in the function's corresponding formal parameter? 3 M

4. Find the output of the following 2 x 3 = 6 M

a.

```
#include<stdio.h>
main( )
{
int i=5, j=2;
junk(&i,&j);
printf("\n %d %d",i,j );
}
junk( int *i ,int *j )
*i= * i * *i;
*j=*j * *j;
}
```

b.

```
#include<stdio.h>
main( )
{
int i=4, j=2;
junk(&i,j);
printf("\n %d %d",i,j );
}
junk( int *i ,j )
*i= * i * *i;
j=j * j;
}
```

c.

```
main( )
{
float a=13.5;
float *b,*c;
b=&a; /*suppose address of a is 1649*/
c=b;
printf("\n %u %u %u",&a,b,c);
}
```

```
printf("\n %f%f%f %f %f", a,*(&a),*&a,*b,*c);  
}
```

5. Convert -103 to its equivalent 2's complement binary number. 6 M

6. Perform X-OR for the following

a: 1100 0101 1010 0000

b: 1100 1010 1111 0101

3 M

BITS, PILANI – DUBAI
International Academic City, Dubai
Second Semester 2009 – 2010
Computer Programming - I TA C162 (1 year)
Test 1 (Closed Book)

No. of Sections : A,B No. of Pages : 2

Duration : 50 mins

Weightage : 25 %

Date : 21.02.2010

MAX : 75 Marks

- Note:** 1. Answer the questions sequentially, questions answered out of sequence will not be evaluated.
2. Do not write full program unless asked for in the question.

PART – A

1. What is Typecasting? Give an Example. 2M

2. What do you mean by the following? Give Examples for each.

- a) Syntax Error
- b) Run-time Error
- c) Logic Error 6M

3. Write the Displayed output for the following, If the value of x and corresponding format is given as

<u>Value</u>	<u>Format</u>	
a) 345	%1d	8M
b) 345	%6d	
c) .5678	%4.2f	
d) -.006	%8.5f	

4. Write the output of the following programs

a)

```
main ()
{
char x;
int y;
x=65;
y=67;
printf("%c\n",x);
printf("%c\n",y);
printf("%d\n",x);
}
```

6M

b)

```
main ()
{
int x=700;
```

```
printf("%d\n",10 + x++);
printf("%d\n",10 + ++x);
}
```

4M

c)

```
main ( )
{
int x = 5, y = 10, z = 10; x = y == z;
printf("%d\n",x);
}
```

2M

5. Write a program to read 3 numbers and find the largest of them using conditional operators

5M

6. What will be the value of x when the following segment is executed?

```
int x = 10, y = 15;
x = (x < y) ? (y + x) : (y - x);
```

2M

PART - B

7. Mention two ways of providing documentation to a program.

5 M

8. Given the following C program statement

```
if (condition)
    printf("Hello");
else
    printf("World");
```

7 M

What should be the condition so that the output will be "HelloWorld".
Rewrite the if statement with the relevant condition.

9. Write a program using **switch..case** statement to determine whether a given number is even or odd and print the message NUMBER IS EVEN or NUMBER IS ODD accordingly.

10 M

10. Given **ch** is a **char** variable and is assigned a letter. Write a program using **if..else** statement that determines whether **ch** is an uppercase letter or a lowercase letter.

Do not use any library function.

8 M

11. Following is a decision table showing the relationship between noise levels and human perceptions of noises. Write a **multiple-alternative if statement** to print the perception for any given loudness measure.

10 M

Loudness in decibels (db)	Perception
50 or lower	quiet
51 – 70	Intrusive
71 – 90	Annoying
91 – 110	Very annoying
Above 110	uncomfortable

----- Best of Luck -----

BITS, PILANI – DUBAI
International Academic City, Dubai
Second Semester 2009 – 2010
Computer Programming - I TA C162 (I year)
Quiz 1 (Closed Book)

No. of Pages : 3 VERSION A

Duration : 20 mins
Date : 11.03.2010

Weightage : 5%
MAX : 15 Marks

ID NO : _____ Name : _____

ANSWER ALL QUESTIONS

1. What output values are displayed by the following while loop for a data value of 7?

```
printf("Enter an integer ");
scanf("%d", &x);
product = x;
count = 0;
while ( count < 4 )
{
    printf("%d\n", product );
    product *= x ;
    count += 1;
}
```

2M

Ans :

2. What is displayed by the following program segments , assuming m is 3 and n is 5?

```
a)
for( i=1; i<=n; ++i)
{
    for ( j=0; j< i; ++j)
    {
        printf("X");
    }
    printf("\n");
}
```

Ans :

```

b)
for( i=n;i>0;- - i)
{
for ( j=m;j>0; - - j)
{
printf("X");
}
printf( "\n");
}

```

2x2=4 M

Ans :

3. Placing a ; after while and for is a _____ error 0.5 M

4. Jumping out of a loop is done using the _____ and _____ statements. 0.5 M

5. A for loop with no test condition is called _____ loop. 0.5 M

6. Write a **for** statement (**body of the loop should have only one statement**) to print each of the following sequence of integers :

a. 1, 2, 4, 8, 16, 32

Ans: for(-----)

2 M

b. -4, -2, 0, 2, 4

Ans : for(-----)

2 M

7. State whether the following are True or false :-

0.5 x 5 = 2.5 M

```

b)
for( i=n;i>0;- - i)
{
for (j=m;j>0;- - j)
{
printf("X");
}
printf( "\n");
}

```

2x2=4 M

Ans :

3. Placing a ; after while and for is a _____ error 0.5 M

4. Jumping out of a loop is done using the _____ and _____ statements. 0.5 M

5. A for loop with no test condition is called _____ loop. 0.5 M

6. Write a for statement (body of the loop should have only one statement) to print each of the following sequence of integers :

a. 1, 2, 4, 8, 16, 32

Ans: for(-----)

2 M

b. -4, -2, 0, 2, 4

Ans : for(-----)

2 M

7. State whether the following are True or false :-

0.5 x 5 = 2.5 M

a. A function in C should have atleast one argument

Ans : _____

b. A function can be defined within the main function

Ans : _____

c. Only a void type function can have void as its argument

Ans : _____

d. A function without a return statement is illegal.

Ans : _____

e. C functions can return only one value under their function name.

Ans : _____

8. In function prototype declaration, specifying _____ is optional.

0.5 M

9. What is the default return data type of a function in C?

0.5 M

Ans :
