NED UNIVERSITY OF ENGINEERING & TECHNOLOGY, KARACHI
FIRST YEAR (COMPUTER SCIENCE AND INFORMATION TECHNOLOGY)
ANNUAL EXAMINATION 2007
BATCH 2006-07

Dated: 06-11-2007

PROGRAMMING LANGUAGES

Time: 3 Hours **(CT-153)** **Max. Marks: 80**

Instruction:
- Solve any Five (5) Problems.
- Problem No. 1 solution is necessary.

PROBLEM NO. 1:

A) What will be the output of the following C code: **(8)**

1)
```
int a = 1;
int b = a+++2;
int c = ++a+2;
printf("a = %d, b = %d, c = %d", a, b, c);
```

2)
```
int w = 5;
int x = w++==6;
int y = !w+w;
int z = w---5;
printf("x = %d, y = %d, z = %d", x, y, z);
if(x || y && z)
   printf("IF: %d", ++w);
else
   printf("ELSE: %d", --w);
```

3)
```
char i[] = "A World of 'Peace' for all";
int j = 0;
while ( i[j] != '\0' )
   putch ( *i+j++ );
```

4)
```
int s[] = { 15, 1, 5, 20, 25 };
int p, q, r;
p=++s[1];
q=s[p]++;
r=s[--q];
printf ( "\n%d %d %d", p, q, r ) ;
```

B) Bracket the following expressions to show operator precedence. **(3)**

i) `a != 7 && c >= 6 || a + c <= 20`

ii) `!(b <= 12) && a % 2 == 0`

iii) `!a > 5 || c < a + d / b`

If a=5, b=10, c=15 and d=0 what are the Boolean values of the expressions?

C) Given the following information answer the questions which follow: (6)

Variable / Pointer	*Content*	*Address*
P	425	2568
Q	2568	4284
R	4284	6242
A[0]	232	8468
A[9]	2568	8478

i. `&P = ?`
ii. `*Q = ?`
iii. `**R = ?`
iv. `**(&R) = ?`
v. `*(&Q) = ?`
vi. `&(*R) = ?`
vii. `&A[0] = ?`
viii. `A = ?`
ix. `A[0] = ?`
x. `&A[4] = ?`
xi. `A[9] = ?`
xii. `*A[9] = ?`

D) Match the following statements to the correct values: (4)

```
int x[][5] = {2,14,6,18,10,1,13,5,11,9,10,20,30,40,50};
```

i. `**x;`	**a.** 13
ii. `*( *( x + 2 ) + 1 );`	**b.** 11
iii. `*( *x + 2 ) + 2;`	**c.** 9
iv. `*( *( x + 1 ) );`	**d.** 14
v. `*( *( x ) + 2 ) + 1;`	**e.** 20
vi. `*( *( x + 1 ) + 3 );`	**f.** 8
vii. `*( x[0] + 2);`	**g.** 1
viii. `*x[2] + 3;`	**h.** 6
	i. 18
	j. 2
	k. 7
	l. 5

E) What C data types would you use to hold the following data? (2)

i. The weight of a postage stamp
ii. Your Examination Seat Number
iii. The Time
iv. A Six Digit Number

Write C statements to declare them all and use Camel notation.

F) How do you print `I can "print" 3%2 and 7\2` using `printf()`. **(1)**

PROBLEM NO. 2:

a) Write a short C program that will: **(6)**

- Set up a structure to hold a **`date`** (the structure will consist of three integer values, for **`month`**, **`day`**, and **`year`**);
- Assign values to the members of the structure; and
- Print out the values in the format `12/31/88` by a function. Pass the structure to the function.

b) Write a program in C language that input a **decimal number** and convert it to binary. **(4)**

c) How can you initialize a three-dimensional array **`arrIntData[3][2][4]`**. How can you refer the first and the last element using pointer? **(4)**

PROBLEM NO. 3:

a) Write a small C utility that copy the content of one file to another. While copying, all small letters should convert to capital letter and vice-versa. All other characters will remain unchanged. **(6)**

b) Write a program which performs the following tasks: **(4)**

- Initialize an integer array of 10 elements in **`main()`**
- Pass the entire array to a function **`makeThrice()`**
- In **`makeThrice()`**, multiply each element of array by 3
- Return the control to **`main()`** and print modified array elements in **main( )**.

c) Write a program to find **factorial value** of any number using function. **(4)**

PROBLEM NO. 4:

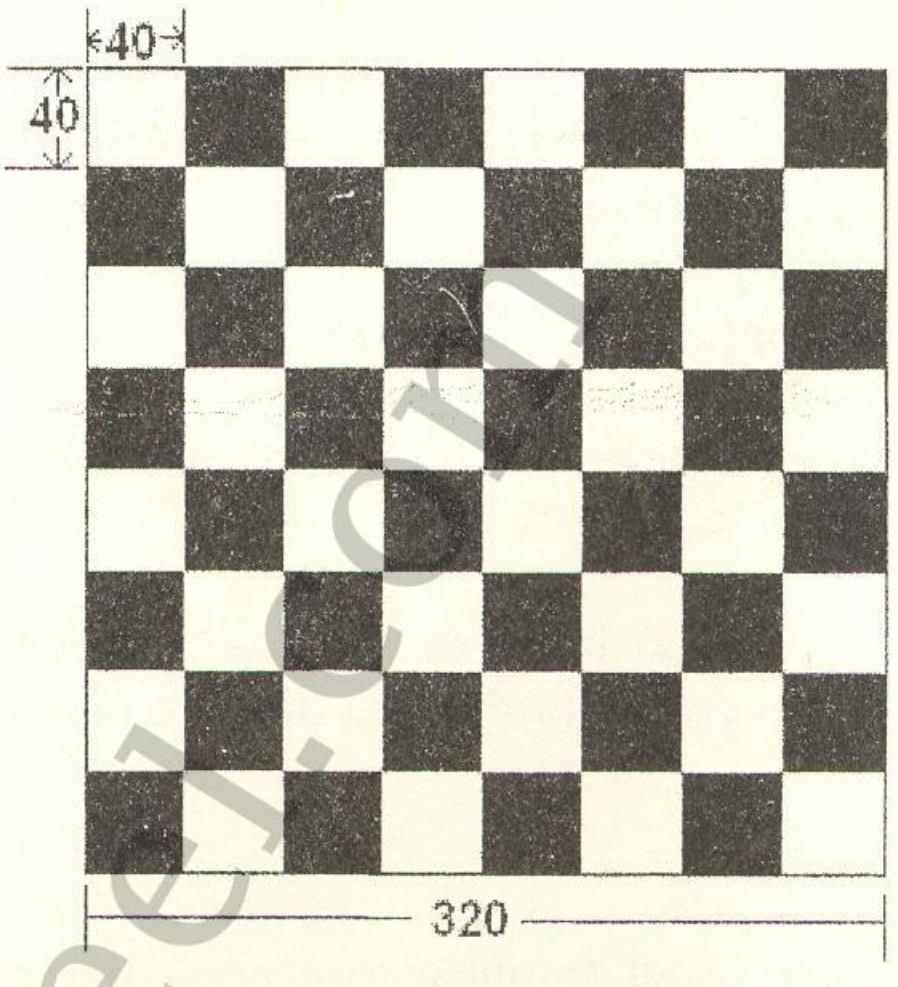
a) A **substitution encryption** is one that substitutes each character of a string by a corresponding predetermined character. For e.g. word '*security*' will become '*tfdvsjuz*' if we add 1 to each character of '*security*'. The resultant text is cipher text. The process to convert plain (original) text into cipher text is called *encryption* and cipher text again back to plain text is known as *decryption*. Write two functions named **`encryption()`** and **`decryption()`** and a program to test it, which ask for a sentence through keyboard and encrypt and decrypt the string using substitution encryption. **(7)**

b) Initialize a 5x5 integer array. Find out the **smallest numbers** in each row and print those values. **(4)**

c) Draw only a **blocked diagram** of compilation and execution phase indicating a conversion of .CPP source file into executable file. **(3)**

PROBLEM NO. 5:

a) Write a C graphics utility to create **chessboard** with 64 (8x8) boxes where each box is 40x40 pixels in size. **(8)**



b) A list consist of 25 integer values given by user. He want to **search** any particular value which he entered from keyboard. Write a program to search the value and display the number of times it appears in the list. **(5)**

c) Differentiate between `gets(str)` and `scanf("%s",str)`. **(1)**

PROBLEM NO. 6:

a) Differentiate the following: **(6)**

i) Static variable and Global variable
ii) `fputs()` and `fwrite()`
iii) `main()` and `void main(void)`
iv) Function and Macro
v) `clrscr()` and `cleardevice()`
vi) Text mode and Binary mode of file

b) How do you write a program which produces its own **source code** as its output? Create C Program. **(5)**

c) What are the three ways of passing arguments to functions? Explain any two of them with code example. **(3)**

PROBLEM NO. 7:

a) Explain the following: **(6)**

i) UML and XML
ii) `window.alert()`
iii) `<FORM>` tags
iv) `<TR>` and `<TD>` tags
v) `private` and `public`
vi) `<B>`, `<I>` and `<U>` tags

b) What do you mean by **inheritance**? Explain by using C# code. **(3)**

c) Create a **Web Page** (.html) that asks the user to enter two integers in html form and display addition result in message box when user press `ADD` button. Use **JavaScript** as a scripting language. **(5)**

PROBLEM NO. 8:

a) By analyzing the given **UML class diagram**, create a class of C-Sharp in `Cricketer.cs` file. Create a Console application that utilizes the C# class by storing and displaying the following data. [Construct two different objects in program.cs]. **(7)**

Batting Average = Total Runs / Number of Innings

UML Class:

Cricketer
- Name : String - NumberOfInnings : Integer - TotalRuns : Integer - BattingAverage : Float
+ setName(nm:String) + getName(): String + setInnings(in:Integer) + getInnings():Integer + setRuns(rn:Integer) + getRuns():Integer + CalculateAverage(): Float

Output:

Name: Javed Miandad *Number Of Innings*: 124 *Total Runs*: 8832 *Batting Average*: 71.22
Name: Inzamam-ul-Haq *Number Of Innings*: 120 *Total Runs*: 8830 *Batting Average*: 73.58

b) Explain the following in context of HTML: **(2)**
   i. Embed **Image** in a Web Page
   ii. Create Table

c) What is **Constructor Overloading**? Write Class in C# to explain. **(2)**

d) What are the differences between **C data types** and **C# data types**? **(3)**