



**FINAL TERM EXAMINATION
SEMESTER FALL 2005
CS508-Modern Programming Languages**

**Total Marks: 100
Duration: 3 Days**

StudentID/LoginID	
Name	
PVC Name/Code	
Date	27-03-2006

Maximum Time Allowed: 3 Days

Please read the following instructions carefully before attempting any question:

The examination mode for the cs508 final term examination is *take home examination*, which mean that you are allowed to take your examination papers to your home or computer labs and complete it using all available resources. Followings are the instructions for doing the take home examination.

- After taking the paper you can either go home to complete your paper or use PVC labs.
- The duration of this take home examination is **three days** of the examination. i.e. for cs508 it is till 29th of March 2006
- On third day (on the last day) upload the solved examination paper on the assignments page of your course. You are allowed to use the lab facilities of the campuses, books and handouts and any other references material available to you.
- The examination papers submitted after the due date will be marked as zero
- Plagiarism or cheating by the students will be dealt severely by Virtual University therefore it is strongly recommended that you do your own work.

For Teacher's use only

Question	Q1	Q2	Q3	Q4	Q5	Total
Marks						

Question No: 1**Marks: 25**

Consider the following Code written in C.

```
int a = 0;

int f(int x, int y)
{
    return (a = x + 1);
}

int g(int *x)
{
    return (*x = a + 2);
}

void main()
{
    double w;
    w = double(a) + f(a, g(&a))/g(&a);
    printf ("w is %f", w);
}
```

On some different important commercial compilers, the values found for the variable **w** were 5.6, 4.5, and 7.5. Furthermore, this last value changed to 2.5 when the expression to compute **w** was changed to:

```
w = f(a, g(&a))/g(&a) + double(a);
```

None of this is an error by the compiler writer!

- (a) Give a justification for each one of these values.
- (b) Would Java have the same kind of problem? Why or why not. Justify.

Question No: 2**Marks:15**

Compare C# and Java and highlight at least five differences. Then critically compare these features and argue why one design is better than the other.

Question No: 3**Marks: 20**

- (a) Write a Prolog description of your family tree (based only on facts), going back to your grandparents and including all descendents (males and females). The facts should include the gender of a person and relationship of every person with every other person.
- (b) Write a set of rules for family relationships, including all relationships from grandparents through two generations. Now add these to the facts of part (a), and eliminate all the facts except the gender and parent-child relationship. You should still be able to establish the relationship of any person with any other person in your family.

Question No: 4

Marks: 15

Compare weak and strong typing. Argue why it is OK to have weak typing in scripting languages but not in other general purpose languages such as Java and C++.

Question No: 5

Marks: 25

Consider the following 5 binding times:

- (1) language design time
- (2) program writing time
- (3) compile time
- (4) load time
- (5) run time

Give at least one example of each of the above for the following languages:

- (i) C++
- (ii) Java
- (iii) Javascript
- (iv) PHP
- (v) C#