



University College Dublin
An Coláiste Ollscoile, Baile Átha Cliath

SEMESTER I EXAMINATION – 2013/2014: [SAMPLE SOLUTIONS](#)

COMP 20080

Computer Science for Engineers II

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Time allowed: 2 hours

Instructions for candidates

Answer ALL questions. Question 1 is worth 40 marks. All other questions are worth 3 marks each.

Write your answers in the Answer Books provided.

Instructions for invigilators

Loose Rough Work sheets are not to be distributed or used.

Use of calculators is prohibited.

SAMPLE SOLUTIONS

1. [40 marks]

(a) Employee.cpp

```
#include "Employee.h"
#include <iostream>
using namespace std;

Employee::Employee(int eid)
{
    id = eid;
    sal = basic_salary;
}
int Employee::get_employee_id()
{
    return id;
}
void Employee::print_details()
{
    cout << "Employee with ID=" << id << " has salary=" << sal << " Euro\n";
}
```

(b) Hourly_Paid_Employee.h

```
#include "Employee.h"
#define rate_per_hour 10
class Hourly_Paid_Employee : public Employee
{
private:
    int hours_worked; // new data field, not in the Employee class

public:
    Hourly_Paid_Employee(int hpeid); // constructor
    void set_hours_worked(int hours); // new method, not in Employee class
    void print_details(); // overriding an inherited method
};
```

(c) Hourly_Paid_Employee.cpp

```
#include "Hourly_Paid_Employee.h"
#include <iostream>
using namespace std;

Hourly_Paid_Employee::Hourly_Paid_Employee(int hpeid) : Employee(hpeid)
// calling base class constructor
{
    hours_worked = 0;
}
void Hourly_Paid_Employee::set_hours_worked(int hours)
{
    hours_worked = hours;
}
void Hourly_Paid_Employee::print_details() // overriding inherited method
{
    int salary = basic_salary + (hours_worked * rate_per_hour);
    cout << "The employee with ID=" << get_employee_id() << " worked for "
    << hours_worked << " hours and has a salary of " << salary << " Euro\n";
}
```

SAMPLE SOLUTIONS

(d) Q1main.cpp

```
#include "Employee.h"
#include "Hourly_Paid_Employee.h"
#include <iostream>
using namespace std;

int main()
{
    int eid, hpeid, hours;

    cout << "Employee's identifier: ";
    cin >> eid;
    cout << "\nHourly Paid Employee's identifier: ";
    cin >> hpeid;
    cout << "\nHow many hours did the latter work?";
    cin >> hours;

    Employee myEmployee(eid);
    Hourly_Paid_Employee myHPEmployee(hpeid);
    myHPEmployee.set_hours_worked(hours);

    myEmployee.print_details();
    myHPEmployee.print_details();
}
```

SAMPLE SOLUTIONS

2. (a) and (c)

3. True

4. (a), (b) and (c)

5. False

6. (c)

7. (b) and (c)

8. (a) and (c)

9. True

10. (a), (b) and (c)

11. (b) and (d)

12. False

13. (a), (b) and (d)

14. (c)

15. (a) and (c)

16. (a) and (b)

17. (b) and (c)

18. True

19. (b)

20. (c)

21. True