Southern College
Kolej Selatan
南方学院

Final Examination
Semester 2 / Year 2005

COURSE   : INTRODUCTION TO COMPUTING
COURSE CODE : CSEG 1003
TIME   : 2 1/2 HOURS
DEPARTMENT   : ELECTRICAL & ELECTRONIC ENGINEERING
CLASS   : DEE05-A + DEE05-B
LECTURER   : TAN TECK SIANG

Student's Name   :
Student's ID   :

Notes to candidates:
1) Write your answer on the examination paper and return it at the end of the examination.
2) For some questions with calculations, you must provide the relevant unit with your answer.

Section A:

*Section A contains **TEN** questions. Candidates should answer all the questions.*
(2 marks for each question)

1. ***True*** or ***false***. A digital computer stores information in bits, which are on/off states.

2. ***True*** or ***false***. ASCII stands for Alternative Standard Code for Internal Interchange (ASCII)

3. ***True*** or ***false***. ROM is comparatively expensive and it losses all data when the power is removed.

4. ***True*** or ***false***. The World-Wide-Web was grown out a research program of the US Defense **A**dvanced **R**esearch **P**roject **A**gency (ARPA). As a result, ARPANET (1969) was established.

5. ***True*** or ***false***. A multitasking operating system will let many users interact with a machine at once.

6. The _____ is a set of electrical lines that connect the CPU, RAM, and other devices.
    a. Peripheral
    b. Bus
    c. Port
    d. Motherboard

7. Which of the following sequence is CORRECT in C++ compilation process?
    a. Source code → Object code→ Linker → Compiler → Executable program
    b. Object code → Source code → Compiler → Linker → Executable program
    c. Source code → Compiler → Object code → Linker → Executable program
    d. Object code → Compiler → Linker → Source code → Executable program

8. Inter-networking research led to the development of the _____ to replace Network Control Protocol.
    a. WAN
    b. TCP/IP
    c. NAT
    d. HTTP

9. Which of the following is not part of the *Program Development Life Cycle?*
    a. Prototyping
    b. Top-down design
    c. Analysis
    d. Trouble-shooting

10. Which of the following coordinates how programs work with the CPU, keyboard, mouse, printer, hardware and software?
    a. ALU
    b. LAN
    c. OS
    d. NAT

Section B:

Section B contains **TEN** questions. Candidates should answer all the questions.

(4 marks for each question)

1. What is the output that would be generated by the following C++ source code?

```
#include "stdafx.h"
#include <iostream>
#include <cmath>

using namespace std;
int main()
        {
        int counter = 3;

        do {
        if (counter ==5)
        counter = counter + 1;
        cout << counter << " ";
        } while ( ++counter <= 8 );

        return 0;
}
```

2. What are the *first* and *last* values of **i** output by this loop?

```
int n = 12;
for (int i = 0; i < n; i++ ) {
cout << i << endl;
}
```

3. What is the output that would be generated by the following C++ source code?

```
int n = 10;
int i = 0;
  do {
  cout << i << endl;
} while ( ++i < n );
```

4. What is the value of the variable **c** after the **switch** statement below?

```
x = 3;
  switch ( x ) {
   case 1: c = 2; break;
   case 2: c = 3; break;
   case 3: c = 1; break;
   default: c = 0; break;
  }
```

5. If y has the value 5 what will be the value of the variable y after the following piece of C++ is executed?

```
y = 5;
if (y > 0)
  y += 2;
else
  y = 3;
```

6. What would be output by the following segment of C++?

```
int i;
for (i=1; i<20; i = i+3)
cout << i << endl;
```

7. What would be output by the following segment of C++?

```
int i;
for ( i = 1; i <= 10; i *= 2 )
cout << (i+2) << endl;
```

8. Write the following mathematical expressions in C++ using the math function from the **math.h** library.

$$z = \frac{4+\sqrt{(a+b)}}{\frac{e}{5}+(c+d)^8}$$

9. What is the final value of x if initially x has a value of 1?

```
x = 1;
if (x >= 0)
x += 5;
else if (x >=5)
x +=2;
```

10. What is the last value of i output by this loop?

```
int n = 27;
int i = 0;
for( i = 0; i <= n; i += 2 ) {
  cout << i << endl;
}
```

Section C:
 Section B contains **TWO** questions. Candidates should answer **ALL** the questions.

1. Write the C++ source code using the *for* statement and appropriate equations to generate the following sequential numbers: **(10 marks)**

   Output
   2, 8, 4, 16, 6, 24, 8, 32

2. The following algorithm is designed to determine whether a student grade is Pass or Fail for a particular subject. There are total of 4 scores (quiz -10, assignment-20%, mid-term-30, and final examination – 40%) being used to determine the grade of a student.

   Algorithms
   Step 1: Input the Student's ID that is in the alphanumerical form. (i.e. DEE0340001)

   Step 2: Input the student's quiz score (i.e. 8)

   Step 3: If the quiz score is not greater than 10, output "Invalid Input!" and repeat Step 2.

   Step 4: Input the student's mid-term exam score (i.e. 26)

   Step 5: If the mid-term score is greater than 30, output "Invalid Input!" and repeat the Step 4

   Step 6: Input the student's final exam score (i.e. 37)

   Step 7: If the mid-term score is greater than 40, output "Invalid Input!" and repeat the Step 6

   Step 8: Output "PASS" if the total score (quiz + assignment + mid-term + final) is greater than 55, otherwise output "FAIL"

   Step 9: end of program

   (a) Contruct the flowchart based on the algorithm as stated above. **(10 marks)**

   (b) Write the C++ source code that based on the above algorithm that would generate the output as follows. **(20 marks)**

   Example Output
   Enter the Student ID: DEE0340001
   Enter the Quiz Score: 12 Invalid Input!
   Enter the Quiz Score: 8
   Enter the Mid-Term Score: 26
   Enter the Final Score: 37
   Student Grade: PASS