UNIVERSITI SAINS MALAYSIA

Supplementary Semester Examination
Academic Session 2005/2006

June 2006

IUK 105E – Computer Applications In Industry
[Aplikasi Komputer Perindustrian]

Duration: 3 hours
[Masa: 3 jam]

Please check that this examination paper consists of <u>TWENTY FOUR</u> pages of printed material before you begin the examination.

Answer <u>ALL</u> questions. Questions in Section B and C can be answered either in Bahasa Malaysia <u>OR</u> English.

Sila pastikan bahawa kertas peperiksaan ini mengandungi <u>DUA PULUH EMPAT</u> muka surat yang bercetak sebelum anda memulakan peperiksaan ini.

Jawab <u>SEMUA</u> soalan. Soalan di Bahagian B dan C boleh dijawab samada dalam Bahasa Malaysia <u>ATAU</u> Bahasa Inggeris.

SECTION A
Each question is worth 1 mark

1.1   The step by step directions given to a computer is called _____

    (a) loop
    (b) sequence
    (c) program
    (d) command

1.2   Which of the following is a program that translates high-level instructions in machine code

    (a) translator
    (b) compiler
    (c) assembler
    (d) source program

1.3   Suppose x, y, and sum are int variables and z is a double variable. What value is assigned to each variable after the statements execute? Suppose x= 3, y= 5, and z = 14.1.

$$z \mathrel{/=} x ;$$
$$y \mathrel{+=} z - x;$$
$$x \mathrel{*=} 2 * y + z;$$

    (a)   x= 3,   y = 5,   z = 14.1
    (b)   x = 50, y = 6,   z = 4.7
    (c)   x = 3,   y = 16.1, z = 4.7
    (d)   x = 50, y = 5,   z = 4.7

1.4 What type of input does the following program require, and in what order does the input need to be provided?

```cpp
#include <iostream>
using namespace std;
int main()
{
   int x,y;
   char ch;
   cin >> x ;
   cin >> ch >> y ;
   return 0 ;
}
```

 (a) character number number
 (b) number character number
 (c) number number character
 (d) character character number

1.5 What is the C++ statement that uses the manipulator setfill to output a line containing 35 stars, as in the following
     ****

 (a) cout << setw(35) << '* ' << setfill ('*') << endl;
 (b) cout << setfill ('*') << setw(35) << '*' << endl;
 (c) cout << ' ' << setfill ('*') << setw(35) << endl;
 (d) cout << setfill ('*') << ' ' << setw(35) << endl;

1.6 Suppose that age is a variable of the int type and name is the variable of the type string. What are the values of age and name after the following input statement executes
   cin >> age;
   getline (cin, name);

   if the input is:
   36
   Anna Lara

 (a) name = "Anna Lara", age = 36
 (b) name = ' ' , age = 36
 (c) age = 36, name = "Anna Lara"
 (d) name = " ", age = 36

1.10 Suppose the input is 38 45 71 4 -1. What is the output of the following code? Assume all the variables are properly declared.

```
cin >> sum;
cin >> num;
while (num != -1)
{
    sum = sum + num;
    cin >> num;
}
    cout << " Sum =  " << sum << endl;
```

(a) Sum = 156
(b) Sum = 157
(c) Sum = 158
(d) Sum = 159

1.11 What is the output of the following C++ code?

```
if ( 5 < 3)
    cout << " * ";
else
    if ( 7 == 8)
    cout << " & ";
    else
cout << " $ ";
```

(a) *
(b) &
(c) $
(d) none of the above

1.12 Which of the following will correctly update the accumulator variable named total?

(a) total = 0;
(b) total = total + total;
(c) total = total + sales;
(d) total = total + 1;

1.13   Use the following switch statement to answer the question

```
switch (id)
{
case 1:   cout << "Janet" << endl;
          break;
case 2:   cout << "Paul" << endl;
          break;
case 3:
case 5:   cout << "Jerry" << endl;
          break;
default:  cout << "Sue" << endl;
} //end switch
```

What will the preceding switch statement display if the id variable contains the number 2?

(a)   Jerry
(b)   Paul
(c)   Sue
(d)   Nothing

1.14   The function header for a C++ void function is named calcTaxes.The function will be passed the value of the main function's gross variable, and the addresses of the main function's federal and state variables. The three variables have data type float.Use the names pay, fedTax, and stateTax for the formal parameters. Write the function prototype for the calcTaxes function.

(a)   void calcTaxes (&float, &float, float);
(b)   void calcTaxes (gross, float federal, float state);
(c)   void calcTaxes (float, float &, float &);
(d)   void calcTaxes (float pay, float fedTax, float stateTax);

1.15   To determine whether an item is being passed *by value* or *by reference,* you will need to examine either the _____ or the _____.

(a)   function call, function header
(b)   function call, function prototype
(c)   function header, function prototype
(d)   function header, function body

1.16 Assume a variable named beginBalance appears in a function's *parameterList*. Which of the following statements are true?

(a) The beginBalance variable will remain in memory until the computer encounters the function's return statement
(b) The beginBalance variable is called a functional variable.
(c) The beginBalance variable can be used anywhere in the program
(d) Both a and b

1.17 Which of the following C++ statements displays a random number in the range 3 through 9?

(a) 1 + rand ( ) % (9 - 3 + 1)
(b) 3 + rand ( ) % (9 - 3 + 1)
(c) 3 + rand ( ) % (9 + 3 - 1)
(d) 9 + rand ( ) % (9 + 1 - 3)

1.18 Which of the following *while* clauses will stop the loop when the value in the *age* variable less than the number 0?

(a) while (age < 0)
(b) while age >= 0;
(c) while (age >= 0);
(d) while (age >= 0)

1.19 If the *selectorExpression* used in the switch statement is the char variable code, which of the following case clauses is valid?

(a) case "3" :
(b) case ' 3 ' :
(c) case 3 ;
(d) case = 3

SECTION B

2. Write a program that converts a temperature from degrees Fahrenheit to degrees centigrade. Use the given statement to convert the temperature from degrees Fahrenheit to degrees centigrade :
centigrade = static_cast<int>((5.0 / 9.0) * (fahrenheit - 32));
The program should output the temperature both in degrees Fahrenheit and degrees centigrade.

(10 marks)

3. In the following code , correct any errors that would prevent the program from compiling. Rewrite the program and highlight your answers.

```
include <iostream>

main ()
{
 int a, b;
 bool found;
 cout << "Enter two integers: ;
 cin >> a >> b;

 if a > a*b && 10 < b
    found = 2 * a > b;
 else
 {
    found = 2 * a < b;
    if found
       a = 3;
       c = 15;
    if b
    {
        b = 0;
       a = 1;
    }
 }
```

(10 marks)

4. The cost of an international call from New York to New Delhi is calculated as follows:

Connection fee, $1.99; $2.00 for the first three minutes; and $0.45 for each additional minute.

Write a program that prompts the user to enter the number of minutes the call lasted and outputs the amount due. Format your output with two decimal places.

Use the if /else form.

(10 marks)

5. Write the C++ if statement that compares the contents of the quantity variable to the number 10. If the quantity variable contains the number that is equal to 10, display the string "Equal". If the quantity variable contains a number that is greater than 10, display the string "Over 10". If the quantity variable contains a number that is less than 10, display the string "Not over 10".

(10 marks)

SECTION C

6. Create a program that displays an employees name and gross pay. The program contains five program-defined value-returning functions : main, getName, getHoursWorked, getPayRate, and calcGross. For the calcGross, assume everyone works 40 or fewer hours per week. The hours worked and rate of pay may contain a decimal place.

(10 marks)

7. Create a program that displays the numbers of vacation weeks due to an employee. The number of vacation weeks is based on the numbers of years the employee has been with the company, as shown in the following table.

Years with the company	Weeks of vacation
0	0
1 – 5	1
6 – 10	2
11 and over	3

If the users enter a negative number of years, the program should display an "Invalid years" message.

(10 marks)

8. Write a program based on the IPO (Input Processing Output) chart given below to calculate the grade in a Programming Class. You will use two program-defined value returning function named getPointsEarned and assignGrade.   (10 marks)

main function

Input	Processing	Output
total points earned grade	Processing items : none Algorithm: 1.total points earned = getPointsEarned() 2.grade = assignGrade(total points earned) 3.display the grade	grade

getPointsEarned function

Input	Processing	Output

project or test score	Processing items : none
	
	Algorithm:
	1.enter the first project or test score
	2.repeat while (the project or test score
	  is greater than or equal to 0)
	    add the project or test score to the total points earned
	
	    enter the next project or test score
	  end repeat while
	
	3.return the total points earned
		total points earned

assignGrade Function

Input	Processing	Output

total points earned	Processing items : none
	
	Algorithm:
	1.if (the total points earned >= 360)
	    assign A to grade
	  else if (the total points earned >= 320)
	    assign B to grade
	  else if (the total points earned >= 280)
	    assign C to grade
	  else if (the total points earned >= 240)
	    assign D to grade
	  else assign F to grade
	2. return grade
		grade

9. Write a program that will calculate and display the price of an order, based on the number of units ordered and the customer's status, (either 1 for wholesaler or 2 for retailer). The price per unit is as follows:

Wholesaler		Retailer	
Number of units	Price per unit($)	Number of units	Price per unit ($)
1 – 4	10	1 – 3	15
5 and over	9	4 – 8	14
		9 and over	12

Use the switch statement to determine the customer's status. If the user enters a status other than 1 or 2, display an appropriate error message. Use the if statement to determine the price per unit. If the user enters an invalid number of units (a negative number or zero), display an appropriate error message.

(10 marks)

BAHAGIAN A
Setiap soalan bernilai 1 markah

1.1 *Arahan langkah-langkah yang diberi kepada computer dinamakan* _____

    (a) *gelung*
    (b) *jujukan*
    (c) *atur cara*
    (d) *perintah*

1.2 *Yang manakah antara berikut ialah atur cara yang menterjemahkan bahasa peringkat tinggi kepada kod mesin*

    (a) *penterjemah*
    (b) *pengkompil*
    (c) *pemasang*
    (d) *atur cara sumber*

1.3 *Katakan x, y dan jumlah adalah pemboleh ubah int dan z ialah pemboleh ubah double. Apakah nilai yang sepatut diberi kepada setiap pemboleh ubah apabila kenyataan berikut dilaksanakan? Jika x= 3, y= 5, dan z = 14.1*

$$z /= x ;$$
$$y += z - x;$$
$$x *= 2 * y + z;$$

    (a) $x= 3,$ $y = 5,$ $z = 14.1$
    (b) $x = 50, y = 6,$ $z = 4.7$
    (c) $x = 3,$ $y = 16.1,$ $z = 4.7$
    (d) $x = 50, y = 5,$ $z = 4.7$

1.4 *Apakah jenis input yang diperlukan oleh atur cara berikut, dan didalam susunan apakah input diperlukan*

```
#include <iostream>
using namespace std;
int main()
{
   int x,y;
   char ch;
   cin >> x ;
   cin >> ch >> y ;
   return 0 ;
}
```

(a) aksara nombor nombor
(b) nombor aksara nombor
(c) nombor nombor aksara
(d) aksara aksara nombor

1.5 Apakah kenyataan C++ yang menggunakan pengolahan setfill untuk mengeluarkan output yang mengandungi 35 bintang, yang ditunjukkan dibawah
****

(a) cout << setw(35) << '*' << setfill ('*') << endl;
(b) cout << setfill ('*') << setw(35) << '* ' << endl;
(c) cout << ' ' << setfill ('*') << setw(35) << endl;
(d) cout << setfill ('*') << ' ' << setw(35) << endl;

1.6 Katakan age adalah pemboleh ubah jenis int dan name adalah pemboleh ubah jenis string. Apakah nilai bagi age dan name setelah kenyataan input dilaksanakan

```
cin >> age;
getline (cin, name);
```

if the input is:
36
Anna Lara

(a) name = "Anna Lara", age = 36
(b) name = ' ',   age = 36
(c) age = 36, name = "Anna Lara"
(d) name = " ", age = 36

1.7 Apakah output bagi kod C++ berikut ?

```
x= 100;
y = 200;
if ( x > 100 && y <= 200)
   cout  << x  << " " << y << " " << x + y << endl ;
else
   cout << x << " " << y << " " << 2 * x – y << endl ;
```

(a) 200 100 0
(b) 100 0 200
(c) 100 200 0
(d) 200 0 100

1.11   Apakah output bagi kod C++ berikut

```
if ( 5 < 3)
  cout << " * ";
else
  if ( 7 == 8)
    cout << " & ";
  else
    cout << " $ ";
```

(a)   *
(b)   &
(c) $
(d)   Tiada diatas

1.12   Manakah yang akan menghimpun pemboleh ubah total dengan betul?

(a)   total = 0;
(b)   total = total + total;
(c)   total = total + sales;
(d)   total = total + 1;

1.13   Gunakan kenyataan switch untuk menjawab soalan berikut.

```
switch (id)
{
case 1:   cout << "Janet" << endl;
          break;
case 2:   cout << "Paul" << endl;
          break;
case 3:
case 5:   cout << "Jerry" << endl;
          break;
default:  cout << "Sue" << endl;
} //end switch
```

Apakah yang akan dipamirkan sebelum kenyataan switch jika pemboleh ubah id mengandungi nombor 2?

(a)   Jerry
(b)   Paul
(c)   Sue
(d)   Tiada apa-apa

1.14   Pengepala fungsi dalam C++ bagi fungsi void dinamakan calcTaxes. Fungsi ini akan diberi nilai fungsi main pemboleh ubah gross, dan alamat fungsi main pemboleh ubah federal and state. Ketiga-tiga pemboleh ubah adalah jenis data float. Guna nama pay, fedTax, and stateTax untuk parameter formal.
Tuliskan fungsi prototaip bagi fungsi calcTaxes.

(a)   void calcTaxes (&float, &float, float);
(b)   void calcTaxes (gross, float federal, float state);
(c)   void calcTaxes (float, float &, float &);
(d)   void calcTaxes (float pay, float fedTax, float stateTax);

1.15   Untuk menentukan sama ada suatu butir itu dihantar melalui value atau by reference, anda perlu perhatikan _____ atau _____

(a)   panggilan fungsi, pengepala fungsi
(b)   panggilan fungsi, fungsi prototaip
(c)   pengepala fungsi, fungsi prototaip
(d)   pengepala fungsi, fungsi badan

1.16   Andaikan pemboleh ubah bernama beginBalance muncul dalam fungsi parameterList. Pernyataan manakah yang benar?

(a)   pemboleh ubah beginBalance berada dalam memori sehingga komputer menemui fungsi kenyataan return
(b)   pemboleh ubah beginBalance ialah pemboleh ubah functional
(c)   pemboleh ubah beginBalance boleh digunakan dimana-mana dalam atur cara
(d)   kedua- dua a dan b

1.17   Yang manakah kenyataan C++ yang memamirkan nombor rawak dalam julat 3 hingga 9?

(a)   1 + rand () % (9 - 3 + 1)
(b)   3 + rand () % (9 - 3 + 1)
(c)   3 + rand () % (9 + 3 - 1)
(d)   9 + rand () % (9 + 1 - 3)

1.18   Yang manakah fasal while yang akan berhentikan gelung apabila nilai dalam pemboleh ubah age kurang dar nombor 0?

(a)   while (age < 0)
(b)   while age >= 0 ;
(c)   while (age >= 0);
(d)   while (age >= 0)

BAHAGIAN B

2. *Tulis satu atur cara yang akan menukar suhu daripada darjah Fahrenheit kepada darjah centigrade. Guna kenyataan diberi untuk menukar suhu daripada darjah Fahrenheit kepada darjah centigrade:*
*centigrade = static_cast<int>((5.0 / 9.0) * (fahrenheit - 32));*
Atur cara akan mengeluarkan output suhu dalam darjah Fahrenheit dan darjah centigrade.

(10 markah)

3. *Bagi kod berikut, perbetulkan sebarang ralat yang boleh menghalang atur cara daripada pengkompilan. Tulis semula atur cara dan highlight jawapan anda.*

```
include <iostream>

main ()
{
  int a, b;
  bool found;
  cout << "Enter two integers: ;
  cin >> a >> b;

  if a > a*b && 10 < b
    found = 2 * a > b;
  else
  {
    found = 2 * a < b;
    if found
      a = 3;
      c = 15;
    if b
    {
      b = 0;
      a = 1;
    }
  }
}
```

(10 markah)

4. Kos suatu panggilan antarabangsa dari New York ke New Delhi dikira seperti berikut:

Bayaran sambungan, $1.99; $2.00 bagi minit pertama; dan $ 0.45 bagi setiap minit tambahan.

Tulis satu atur cara yang menyuruh pengguna memasukkan bilangan minit yang digunakan dan output bayaran yang dikenakan. Format output anda kepada dua tempat perpuluhan Guna bentuk if/else.

(10 markah)

5. Tulis kenyataan C++ yang membandingkan isi bagi pemboleh ubah quantity kepada nombor 10. Jika pemboleh ubah quantity mengandungi nombor sama dengan 10, pamirkan string "Equal". Jika pemboleh ubah quantity mengandungi nombor lebih daripada 10, pamirkan string "Over 10". Jika pemboleh ubah quantity mengandungi nombor kurang daripada 10, pamirkan string " Not Over 10".

(10 markah)

BAHAGIAN C

6. Bina satu atur cara yang mempamirkan nama dan gaji kasar pekerja. Atur cara tersebut mempunyai lima program-defined value-returning functions : main, getName, getHoursWorked, getPayRate, and calcGross. Bagi calcGross, andaikan semua pekerja bekerja 40 atau kurang jam setiap minggu. Bilangan jam bekerja dan kadar bayaran mungkin mempunyai tempat perpuluhan.

(10 markah)

7. Bina satu atur cara yang mempamirkan bilangan minggu percutian yang diberi kepada seseorang pekerja. Bilangan minggu percutian itu berdasarkan kepada berapa lama beliau bekerja dengan syarikat itu, seperti yang ditunjukkan dalam jadual dibawah.

Years with the company	Weeks of vacation
0	0
1 – 5	1
6 – 10	2
11 and over	3

Jika pengguna memasukkah nombor negative bagi tahun, atur cara akan mempamirkan mesej "Invalid years".

(10 markah)

8. Tuliskan satu atur cara berdasarkan IPO (Input Processing Output) yang diberi untuk mengira gred dalam satu kelas Programming. Anda akan menggunakan dua program-defined value returning functions, getPointsEarned and assignGrade.

main function

Input	Processing	Output
total points earned grade	Processing items : none Algorithm: 1.total points earned = getPointsEarned() 2.grade = assignGrade(total points earned) 3.display the grade	grade

getPointsEarned function

Input	Processing	Output
project or test score	Processing items : none Algorithm: 1.enter the first project or test score 2.repeat while (the project or test score is greater than or equal to 0) add the project or test score to the total points earned enter the next project or test score end repeat while 3.return the total points earned	total points earned

assignGrade Function

Input	Processing	Output
total points earned	Processing items : none Algorithm: 1.if (the total points earned >= 360) assign A to grade else if (the total points earned >= 320) assign B to grade else if (the total points earned >= 280) assign C to grade else if (the total points earned >= 240) assign D to grade else assign F to grade 2. return grade	grade

(10 markah)

9. *Bina satu atur cara yang akan mengira dan pamirkan harga sesuatu pesanan, berdasarkan bilangan unit yang dipesan, dan status pengguna (1 untuk pemborong dan 2 untuk peruncit). Harga satu unit adalah seperti berikut:*

Wholesaler		Retailer	
Number of units	Price per unit($)	Number of units	Price per unit ($)
1 – 4	10	1 – 3	15
5 and over	9	4 – 8	14
		9 and over	12

Guna kenyataan switch untuk menentukan status pengguna. Jika pengguna memasukkan status selain 1 atau 2, pamirkan mesej ralat yang sesuai. Guna kenyataan if untuk menentukan harga seunit. Jika pengguna memasukkan bilangan unit yang tidak sah (nombor negatif atau 0), pamirkan mesej ralat yang sesuai.

(10 markah)

-ooo000ooo-