UNIVERSITI TUN HUSSEIN ONN MALAYSIA

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JANGKA MASA	:	3 JAM
ARAHAN	:	JAWAB **SEMUA** SOALAN.

KERTAS SOALAN INI MENGANDUNGI DUA PULUH TIGA (23) MUKA SURAT

SECTION A

Instruction: State whether each of the following statement is **TRUE** or **FALSE**.

Q1 All C++ programs must have `main()` function.

Q2 Variables are expressions with a fixed value.

Q3 Given the code segment below, the output that will be displayed on the screen is 50.

```
int a, b, c;
b = 8 ;
c = 16 ;
a = 100 * b % c;
cout << a ;
```

Q4 The `do-while` loop will execute at least once even if condition is never fulfilled.

Q5 The `default` statement in the `switch` statement is compulsory.

Q6 The `next` and `repeat` statements are iteration control structures in C++.

Q7 A function is a group of statements that executed when it is called from some point of the program.

Q8 In order for a variable declared within a function to be used outside the function, it must be declared as global type.

Q9 Given code segment below, the arguments passed to the function is passed by reference.

```
void calculate (int& a, int& b, int& c)
    {
            a*=2;
            b*=3;
            c*=4;
    }
```

Q10   Given the code segment below, the array `mynumber` size would be 5.

```
int mynumber [] = { 5, 19, 2, 93, 70, 123 };
```

(10 marks)

SECTION B

Instruction: Answer **ALL** questions.

Q11   When a number gets assigned to a variable that already has a value _____.

    A.   the new number overwrites the previous value at that memory location.
    B.   the new number gets assigned to a neighboring memory location.
    C.   the computer issues an error.
    D.   the new value is destroyed and the old value remains.

Q12   Syntax errors in a C++ application _____.

    A.   can cause subtle error when the application runs.
    B.   are ignored by the compiler.
    C.   prevent the application from compiling correctly.
    D.   are detected after the application has been completed.

Q13   What is the output of the following program segment?

```
int x, y, z;
x=5;
y=3;

cout<< x/y << " ";
x = x * 10;
y = y * y;
z = 10 * y % x;
cout << z;
```

    A.   2 1
    B.   2 40
    C.   1 40
    D.   1 1

Q14   Which of the following data types can be used to represent the conditional expression of the `switch` statement?

    i.   `int`
    ii.   `double`
    iii.   `float`
    iv.   `char`

A. i only.
B. i, iv.
C. ii, iii.
D. i, ii, iii, iv.

Q15 What is the output of the C++ code below?

```
int y = 10;

if(y < 10)
        cout << " Slow ";
        cout << " Medium ";
cout << Fast ";
```

A. Fast
B. Medium
C. Medium Fast
D. Slow Medium Fast

Q16 What is the output of the C++ code below?

```
int x = 1;
do
{
        cout << " X "<<"   " ;
        x-- ;
}while (x > 0);

cout « endl;
```

A. 1
B. X
C. X 1
D. 1 0

Q17 Which of the following statements is **FALSE**?

A. An infinite loop is a loop that continues endlessly.
B. A do while statement will be executed at least once.
C. A w h i l e statement tests the condition before entering the body of the loop.

D.   In a sentinel-controlled loop, the input value should always be evaluated after being processed.

Q18   Suppose j, sum, and num are int variables, and the input values are 26, 34, 61, 4, and -1. What is the output of the code below?

```
sum = 0;
cin >> num;

for(j=1;j<=4; j++)
{
        sum = sum + num;
        cin >> num;
}
cout << sum << endl;
```

A.   124
B.   125
C.   126
D.   127

Q19
```
double mySqrt(int x);
```

Based on code segment above, function prototype is _____.

A.   declares a function called mySqrt which takes an integer as an argument and returns a double.
B.   defines a function called double which calculates square roots.
C.   defines a function called mySqrt which takes an argument of type x and returns a double.
D.   declares a function called mySqrt which takes a double as an argument and returns an integer.

Q20 Given the following statements:

```
cin » num;
cout « FindXY(12, 2.5, num);
```

Choose the **CORRECT** function prototype for function `FindXY`.

i.   `int FindXY (int, float, int&);`
ii.   `float FindXY (char, float, int);`
iii.   `int FindXY (int, float, int);`
iv.   `void FindXY (int, float, float);`

A.   i, ii.
B.   i, iii.
C.   i, ii, iii.
D.   i, ii, iii, iv.

(10 marks)

SECTION C

Instruction: Answer **ALL** questions.

Q21   Write the appropriate statements that match the following comments:

(a)   Declare firstNum, secondNum and sum variables.

(3 marks)

(b)   Prompt the user to input two integers: firstNum and secondNum

(4 marks)

(c)   Output all odd numbers between firstNum and secondNum inclusively

(4 marks)

(d)   Output the sum of all even numbers between firstNum and secondNum inclusively

(4 marks)

Q22 Given the following program:

```
void main()
{
int a, b, c;
cin >> a;
b = a;
c = b + a;
do{
if (a > b)
b = a;
else
if (a < c)
c = a;
cin >> a;
}while (a!= -99);
cout << "Message1 " << b << endl;
cout << "Message2 " << c << endl;
}
```

(a) Correct the indentation to make the program more readable.

(4 marks)

(b) Give the output for the following input data:
100, 4, 65, 125, 52, -99

(4 marks)

(c) Give more suitable name for variables b and c.

(2 marks)

(d) Replace Message1 and Message2 with more suitable messages.

(2 marks)

(e) What is the sentinel value for this program?

(1 mark)

(f) When n numbers are input, how many times the 'do..while' statement will be executed?

(2 marks)

Q23 Please answer the following questions:

(a) Given the following declarations:

```
const double pie = 3.142;
int mynum = 9, n = 15;
```

Evaluate each the following C++ expression:

(i)   `3 * pie + mynum / n`
(ii) `4 * mynum % n + p i e`
(iii) `1 - (mynum / 2) * 3`

(3 marks)

(b) Write the code for C++ function given the following function prototypes and definitions:

(i)   `int calcSum(int, int);`

This function receives two values through its parameters. This function then adds the received values and returns the sum.

(3 marks)

(ii) `void findHighest (char, int, char&, int&);`

This function receives two codes and two values associated with the codes respectively through its parameters. This function then finds the higher value and passes the value with its code through the parameters.

(4 marks)

(c) Given following C++ program, determine the output:

```
int myarray [] = {16, 2, 77, 40, 12071};
int n, result=0;

void main ()
{
        for (n = 0; n < 5; n++ )
        {
          result += myarray[n];
```

```
    }
      cout << result;
  }
```

(2 marks)

(d)   Given following C++ program, determine the output:

```
void main ()
{
  int firstvalue = 5, secondvalue = 15;
  int * p1, * p2;

  p1 = &firstvalue;
  p2 = &secondvalue;
  *p1 = 10;
  *p2 = *p1;
  p1 = p2;
  *p1 = 20;

  cout << "firstvalue is " << firstvalue << endl;
  cout << "secondvalue is " << secondvalue << endl;

}
```

(3 marks)

Q24 As a programmer in Al-Amin Bank Berhad, you are required to write a program for Auto Teller Machine (ATM) application. This program must perform balance enquiry (display the *account balance*), deposit (input the *deposit amount* before increasing the *account balance*), and withdraw (input the *withdraw amount* before reducing *account balance*).

Before any transaction can be done, the customer should enter an integer *password* as input. The *password* will be validated by calling function `int validatePassword(int)`. This function will return a value '1' if the *password* is correct and '0' otherwise. The program will allow up to **THREE (3)** attempts if the customer enters a wrong *password* before it displays an appropriate message and terminate if the third attempt failed. Once the *password* is correct, the program will display the following menu:

```
Al-Amin Bank Berhad
Main Menu
1 - Balance Enquiry
2 - Deposit
3 - Withdrawal
4 - Quit
```

Your program must allow the customer to perform any transactions repetitively until the customer decided to exit the program by entering an *option* number 4. Call the function `double getBalance()` to return the customer's *account balance*. Call the function `void Deposit(double)` and `void Withdrawal(double)` do deposit and withdrawal activity. Assume the initial balance amount in the account is RM1000.00. Display an appropriate message if the customer enters an invalid *option*.

(15 marks)

BAHAGIAN A

Arahan: Nyatakan samada pernyataan yang diberikan **BENAR** atau **SALAH**.

S1   Semua aturcara C++ mesti mempunyai fungsi `main()`.

S2   Pembolehubah ialah ungkapan yang mempunyai nilai tetap.

S3   Diberi keratan aturcara di bawah, nilai yang akan dipaparkan di skrin ialah 50.

```
int a, b, c;
b = 8 ;
c = 16 ;
a = 100 * b % c;
cout << a ;
```

S4   Gelung `do-while` akan dilaksanakan sekurang-kurangnya sekali walaupun syarat gelung langsung tidak dipenuhi.

S5   Pernyataan `default` dalam pernyataan `switch` adalah diwajibkan.

S6   Pernyataan `next` dan `repeat` merupakan struktur kawalan pengulangan dalam C++.

S7   Function merupakan sekumpulan pernyataan yang dilaksanakan apabila dipanggil daripada beberapa tempat di dalam aturcara.

S8   Untuk membolehkan pembolehubah yang diisytiharkan didalam fungsi digunakan diluar daripada fungsi, ia mestilah diisytiharkan sebagai jenis global.

S9 Rujuk keratan aturcara dibawah, penghantaran arguments ke fungsi dikenali sebagai penghantaran dengan rujukan (passed by reference).

```
void calculate (int& a, int& b, int& c)
        {
                a*=2;
                b*=3;
                c*=4;
        }
```

S10 Diberi keratan aturcara seperti di bawah, tatasusunan *mynumber* mempunyai saiz 5.

```
int mynumber [] = { 5, 19, 2, 93, 70, 123 };
```

(10 markah)

BAHAGIAN B

Arahan: Jawab **SEMUA** soalan.

S11 Apabila sesuatu nombor diumpukkan kepada sesuatu pembolehubah yang mempunyai sesuatu nilai,

    A. nombor yang baru tersebut akan menggantikan nilai yang lama pada alamat lokasi pembolehubah itu.

    B. nombor yang baru tersebut akan diletakkan di alamat lokasi yang bersebelahan.

    C. komputer akan mengeluarkan ralat.

    D. nilai yang baru tersebut akan dihapuskan dan nilai yang lama akan dikekalkan.

S12 Ralat syntax dalam aturcara C++ adalah _____ .

    A. boleh menyebabkan ralat yang tidak langsung apabila aturcara dilaksanakan.

    B. diabaikan oleh penghimpun (*compiler*).

    C. menyebabkan aturcara tidak dapat dihimpunkan dengan betul.

    D. dikesan selepas aturcara selesai dilaksanankan.

S13 Apakah paparan yang akan dihasilkan oleh keratan aturcara di bawah?

```
int x, y, z;
x=5;
y=3;

cout<< x/y << " ";
x = x * 10;
y = y * y;
z = 10 * y % x;
cout << z;
```

    A. 2 1

    B. 2 40

    C. 1 40

    D. 1 1

S14 Jenis data di bawah yang mana yang boleh digunakan dalam pernyataan bersyarat `switch`?

i.   `int`
ii.   `double`
iii.   `float`
iv.   `char`

A.   i only.
B.   i, iv.
C.   ii.iii.
D.   i, ii, iii, iv.

S15 Apakah hasil paparan keratan aturcara C++ di bawah?

```
int y = 10;

if(y < 10)
      cout << " Slow ";
      cout << " Medium ";
cout << Fast ";
```

A.   Fast
B.   Medium
C.   Medium Fast
D.   Slow Medium Fast

S16 Apakah hasil paparan keratan aturcara C++ di bawah?

```
int x = 1;
do
{
      cout << " X "<<" " ;
      x-- ;
}while (x > 0);

cout « endl;
```

A.   1
B.   X
C.   X 1
D.   1 0

16

S17   Pernyataan yang manakah **SALAH**?

    A.   Gelung tak terhingga (*infinite loop*) ialah gelung yang tidak berkesudahan.
    B.   Pernyataan `do-while` akan dilaksanakan sekurang-kurangnya sekali.
    C.   Pernyataan `while` menguji syarat sebelum memasuki pernyataan dalam gelung.
    D.   Dalam gelung kawalan *sentinel*, nilai masukan(*input*) akan dinilai selepas diproses.

S18   Andaikan `j`, `sum`, dan `num` adalah pembolehubah berjenis *int*, dan nilai masukan(*input*) adalah 26, 34, 61, 4, dan -1. Apakah hasil paparan bagi keratan aturcara di bawah?

```
sum = 0;
cin >> num;

for(j=1;j<=4;  j++)
{
        sum = sum + num;
        cin >> num;
}
cout << sum << endl;
```

    A.   124
    B.   125
    C.   126
    D.   127

S19
```
double mySqrt(int x);
```

Berdasarkan kod segmen di atas, prototaip fungsi adalah _____ .

    A.   mentakrifkan fungsi `mySqrt` yang menerima nilai berjenis `integer` sebagai satu *argument* dan memulangkan satu nilai berjenis `double`.
    B.   mentakrifkan satu fungsi bernama `double` yang mengira `square roots`.
    C.   mentakrifkan satu fungsi dipanggil `mySqrt` yang menerima `argument` berjenis `x` dan memulangkan nilai berjenis `double`.
    D.   mentakrifkan satu fungsi bernama `mySqrt` yang menerima satu nilai berjenis `double` sebagai `argument` dan memulangkan satu nilai berjenis `integer`.

S20   Diberi pernyataan seperti di bawah:

```
cin >> num;
cout << FindXY(12, 2.5, num);
```

Pilih prototaip fungsi yang **BETUL** untuk fungsi `FindXY`.

i. `int FindXY (int, float, int&);`
ii. `float FindXY (char, float, int);`
iii. `int FindXY (int, float, int);`
iv. `void FindXY (int, float, float);`

A.   i, ii.
B.   i, iii.
C.   i, ii, iii.
D.   i, ii, iii, iv.

(10 markah)

BAHAGIAN C

Arahan: Jawab **SEMUA** soalan.

S21   Tulis pernyataan yang sesuai dengan komen yang diberikan:

(a)   Isytihar pembolehubah `firstNum`, `secondNum` dan `sum`.

(3 markah)

(b)   Meminta pengguna memasukkan dua nilai berjenis *integer*: `firstNum` dan `secondNum`.

(4 markah)

(c)   Paparkan semua nombor ganjil yang berada di antara `firstNum` dan `secondNum` termasuk `firstNum` dan `secondNum`.

(4 markah)

(d)   Paparkan kesemua nombor genap yang berada di antara `firstNum` dan `secondNum` termasuh `firstNum` dan `secondNum`.

(4 markah)

S22   Diberi aturcara seperti di bawah:

```
void main()
{
int a, b, c;
cin » a;
b = a;
c = b + a;
do{
if (a > b)
b = a;
else
if (a < c)
c = a;
cin » a;
}while (a!= -99);
cout « "Message1 " « b « endl;
cout « "Message2 " « c « endl;
}
```

(a)   Betulkan *indentation* aturcara di atas supaya lebih senang dibaca.

(4 markah)

(b)   Beri hasil paparan untuk nilai masukan(*input*) seperti di bawah:
         100, 4, 65, 125, 52, -99

(4 markah)

(c)   Beri nama yang lebih sesuai untuk pembolehubah b dan c.

(2 markah)

(d)   Gantikan Message1 dan Message2 dengan mesej yang sesuai.

(2 markah)

(e)   Apakah nilai *sentinel* untuk aturcara program ini?

(1 markah)

(f)   Apabila jumlah masukan(*input*) adalah n, kirakan berapa kalikah jumlah pernyataan do..while akan dilaksanakan?

(2 markah)

S23   Sila jawab soalan yang berikut:

(a)   Diberi pengisytiharan seperti di bawah:

```
const double pie = 3.142;
int mynum = 9, n = 15;
```

Nilaikan setiap ungkapan C++ yang berikut:

    (i)   `3 * pie + mynum / n`

    (ii)   `4 * mynum % n + p i e`

    (iii)   `1 - (mynum / 2) * 3`

                                                        (3 markah)

(b)   Tulis aturcara C++ untuk fungsi jika diberi prototaip dan penakrifan fungsi seperti yang berikut:

    (i)   `int calcSum(int, int);`

          Fungsi ini menerima dua nilai melalui *parameter*-nya. Fungsi ini menambah nilai-nilai yang diterima dan memulangkan hasil tambah kedua-duanya.

                                                         (3 markah)

    (ii)   `void findHighest (char, int, char&, int&);`

          Fungsi ini menerima dua kod dan dua nilai yang berpasangan dengan kod melalui *parameter*-nya. Fungsi ini kemudian mencari nilai yang lebih tinggi diantara dua nilai yang diterima dan menghantar nilai tersebut dan juga pasangan kodnya melalui *parameter*.

                                                          (4 markah)

c)   Diberi aturcara C++ yang berikut, tentukan hasil paparan:

```
int myarray [] = {16, 2, 77, 40, 12071};
int n, result=0;

void main ()
{
        for (n = 0; n < 5; n++ )
        {
          result += myarray[n];
    }
    cout << result;
}
```

                                                          (2 markah)

d)   Diberi aturcara C++ yang berikut, tentukan hasil paparan:

```cpp
void main ()
{
  int firstvalue = 5, secondvalue = 15;
  int * p1, * p2;

  p1 = &firstvalue;
  p2 = &secondvalue;
  *p1 = 10;
  *p2 = *p1;
  p1 = p2;
  *p1 = 20;

  cout << "firstvalue is " << firstvalue << endl;
  cout << "secondvalue is " << secondvalue << endl;

}
```

(3 markah)