



**FINAL EXAM / PEPERIKSAAN AKHIR
SEMESTER II – SESSION 2020 / 20121
PROGRAM KERJASAMA**

COURSE CODE : DDWD1603 / DDWC1603 / DDPC 1603
KOD KURSUS

COURSE NAME : C++ PROGRAMMING
NAMA KURSUS PENGATURCARAAN C++

YEAR / PROGRAMME : 1 DDWD / DDWC / DDWZ
TAHUN / PROGRAM

COLLEGE :
KOLEJ

DURATION : 3 HOURS (INCLUDING SUBMISSION HOUR)
TEMPOH 3 JAM (TERMASUK MASA PENGHANTARAN)

DATE : APRIL / MAY 2021
TARIKH

INSTRUCTION / ARAHAN

1. The question paper consists of 4 sections: A, B, C and D.
Kertas soalan terdiri daripada 4 bahagian: A, B, C dan D.
2. Answer **ALL** questions and write your answer on the answer sheet.
*Jawab **SEMUA** soalan dan tulis jawapan anda pada kertas jawapan.*
3. Write your name, matric no., identity card no. , course code, course name, section no. and lecturer's name on the first page (in the upper left corner) and every page thereafter on the answer sheet.
Tulis nama anda, no. matrik, no. kad pengenalan, kod kursus, nama kursus, no. seksyen dan nama pensyarah pada muka surat pertama (penjuru kiri atas) kertas jawapan dan pada setiap muka surat jawapan.
4. Each answer sheet must have a page number written at the bottom right corner.
Setiap helai kertas jawapan mesti ditulis nombor muka surat pada bahagian bawah penjuru kanan.
5. Answers should be handwriting, neat and clear.
Jawapan hendaklah ditulis tangan, kemas dan jelas menggunakan huruf cerai.

WARNING / AMARAN

Students caught copying / cheating during the examination will be liable for disciplinary actions and the faculty may recommend the student to be expelled from sitting for exam.
Pelajar yang ditangkap meniru / menipu semasa peperiksaan akan dikenakan tindakan disiplin dan pihak fakulti boleh mengesyorkan pelajar diusir dari menduduki peperiksaan.

This examination paper consists of 14 pages including the cover
Kertas soalan ini mengandungi 14 muka surat termasuk kulit hadapan

ONLINE EXAMINATION RULES AND REGULATIONS

PERATURAN PEPERIKSAAN SECARA DALAM TALIAN

1. Student must carefully listen and follow instructions provided by invigilator.
Pelajar mesti mendengar dan mengikuti arahan yang diberikan oleh pengawas peperiksaan dengan teliti.
2. Student is allowed to start examination only after confirmation of invigilator if all needed conditions are implemented.
Pelajar dibenarkan memulakan peperiksaan hanya setelah pengesahan pengawas peperiksaan sekiranya semua syarat yang diperlukan telah dilaksanakan.
3. During all examination session student has to ensure, that he is alone in the room.
Semasa semua sesi peperiksaan pelajar harus memastikan bahawa dia bersendirian di dalam bilik.
4. During all examination session student is not allowed to use any other devices, applications except other sites permitted by course lecturer.
Sepanjang sesi peperiksaan pelajar tidak dibenarkan menggunakan peranti dan aplikasi lain kecuali yang dibenarkan oleh pensyarah kursus.
5. After completing the exam student must inform invigilator via the set communication platform (eg. WhatsApp etc.) about completion of exam and after invigilator's confirmation leave examination session.
Selepas peperiksaan selesai, pelajar mesti memaklumkan kepada pengawas peperiksaan melalui platform komunikasi yang ditetapkan (contoh: Whatsapp dan lain-lain) mengenai peperiksaan yang telah selesai dan meninggalkan sesi peperiksaan selepas mendapat pengesahan daripada pengawas peperiksaan.
6. Any technical issues in submitting answers online have to be informed to respective lecturer within the given 30 minutes. Request for re-examination or appeal will not be entertain if complains are not made by students to their lecturers within the given 30 minutes.
Sebarang masalah teknikal dalam menghantar jawapan secara dalam talian perlu dimaklumkan kepada pensyarah masing-masing dalam masa 30 minit yang diberikan. Permintaan untuk pemeriksaan semula atau rayuan tidak akan dilayan sekiranya aduan tidak dibuat oleh pelajar kepada pensyarah mereka dalam masa 30 minit yang diberikan.
7. During online examination, the integrity and honesty of the student is also tested. At any circumstances student is not allowed to cheat during examination session. If any kind of cheating behaviour is observed, UTM have a right to follow related terms and provisions stated in the respective Academic Regulations and apply needed measures.
Semasa peperiksaan dalam talian, integriti dan kejujuran pelajar juga diuji. Walau apa pun keadaan pelajar tidak dibenarkan menipu semasa sesi peperiksaan. Sekiranya terdapat sebarang salah laku, UTM berhak untuk mengikuti terma yang dinyatakan dalam Peraturan Akademik.

Excerpts from online final exam guidelines

Petikan daripada panduan peperiksaan akhir dalam talian

Universiti Teknologi Malaysia

SECTION A: TRUE/FALSE [10 MARKS]

BAHAGIAN A: BENAR/SALAH [10 MARKAH]

Instruction: Write your answers in the spaces provided in attachment answer script.

Arahan: Tuliskan jawapan di ruang yang disediakan di dalam kertas jawapan yang di lampirkan.

1. C Identifier name as VAR_1234 is invalid in C++?
Nama pengecam sebagai VAR_1234 tidak sah dalam C ++?
2. A paragraph comment need to begins with */** and end with */**.
Satu komen perenggan hendaklah bermula dengan / dan diakhiri dengan /*.*
3. A variable can store only one value at a time.
Satu pembolehubah boleh menyimpan satu nilai pada satu masa.
4. If an expression contains more than one operator having the same priority, those operators are evaluated from left to right.
Sekiranya ungkapan mengandungi lebih daripada satu operator yang mempunyai keutamaan yang sama, operator tersebut dinilai dari kiri ke kanan.
5. Statement **getSum (int area, int quantity);** is a legal function call.
*Penyataan **getSum (int area, int quantity);** adalah satu panggilan fungsi yang sah.*
6. Depending on the result of the evaluation, the instructions in a while loop maybe will not implement. never be processed.
Bergantung pada hasil penilaian, arahan di dalam satu gelung while berkemungkinan tidak akan dilaksanakan.
7. In for loop statement, braces { } must be included even when the loop body contains only one statement.
Dalam pernyataan gelung for, pendakap { } mesti dimasukkan walaupun badan gelung mengandungi hanya satu pernyataan.
8. Repetition structure directs the computer to repeat one or more instructions until some condition is met.
Dalam struktur ulangan mengarahkan komputer mengulang satu atau lebih arahan sehingga beberapa syarat dipenuhi.
9. Passing a variable's address to a function is referred to as passing by address.
Menghantar alamat pembolehubah kepada fungsi dirujuk sebagai pehantaran alamat.
10. A local variable can be used only within the statement block in which it is declared.
Pembolehubah tempatan boleh digunakan hanya dalam blok pernyataan di mana ia dinyatakan.

SECTION B: OBJECTIVE [30 MARKS]

BAHAGIAN B: OBJEKTIF [30 MARKAH]

Instruction: Write your answers in the spaces provided in attachment answer script.

Arahan: Tuliskan jawapan di ruang yang disediakan di dalam kertas jawapan yang di lampirkan.

1. Which of the following is the correct syntax of including a user defined header files in C++?
Antara berikut yang manakah sintaks yang betul termasuk memasukkan fail tajuk yang ditentukan pengguna dalam C ++?

A. #include <userdefined>
B. #include "userdefined.h"
C. #include <userdefined.h>
D. #include [userdefined]

2. Which is the TRUE calling function to calculate $4 * 4 * 4$?
*Manakah panggilan fungsi yang BENAR untuk mengira $4 * 4 * 4$?*

A. pow (4.0, 3.0)
B. pow (3.0, 4.0)
C. power (3.0, 4.0)
D. power (4.0, 3.0)

3. When $a=6$ and $c=a++$ what is the value of c ?
Apabila $a = 6$ dan $c = a ++$ berapakah nilai c ?

A. 5
B. 6
C. 7
D. 8

4. What is the output of this program?
Apakah output aturcara ini?

```
#include <iostream>
using namespace std;
int main()
{
    int num = 6;
    int*p = &num;
    *p = *p + 12 / 3 ;
    cout << *p;
    return 0;
}
```

A. 4
B. 6
C. 10
D. address of num
alamat num

5. Which of the following correctly declares an array of size 9?
Yang mana satu benar berkenaan pengisytiharkan satu tatasusunan bersaiz 9?

A. int array [10];
B. int array []={1, 2, 3, 4, 5, 6, 7, 8, 9};
C. int array {10};
D. array array[9];

6. The statement `int A; b;` is invalid because _____
Penyataan `int A; b;` tidak sah kerana _____
- A. Capital A is not allowed.
Huruf besar A tidak dibenarkan.
 - B. Only one variable should be given.
Hanya satu pembolehubah sepatutnya diberi.
 - C. The data type is not correct.
Jenis data tidak benar.
 - D. Variables should be separated by Comma.
Pembolehubah sepatutnya dipisahkan dengan koma.
7. _____ are the kind of data that variables hold in C++ programming language.
_____ *adalah jenis data yang dimiliki oleh pembolehubah dalam bahasa pengaturcaraan C++.*
- A. Conditional type / *Jenis syarat*
 - B. Constant type / *Jenis pemalar*
 - C. Data type / *Jenis data*
 - D. Variable type / *Jenis pembolehubah*
8. _____ variables are sensitive to the data type they point to.
_____ *pembolehubah peka terhadap jenis data yang mereka tunding.*
- A. char
 - B. integer
 - C. pointer
 - D. boolean
9. What is the output of the following C++ code?
Apakah output kod C++ berikut?
- ```
int list[5] = {0, 5, 10, 15, 20};
int j=0;
for (j = 1; j < 5; j++)
 cout<< list[j] << " ";
cout<<endl;
```
- A. 0 1 2 3 4
  - B. 0 5 10 15
  - C. 0 5 10 15 20
  - D. 5 10 15 20
10. Which operator is suitable for the concatenation function of a string class?  
*Operator mana yang sesuai untuk fungsi gabungan kelas rentetan?*
- A. + operator
  - B. < operator
  - C. – operator
  - D. > operator

11. For finding the number of characters in the string, which function is used?

*Untuk mencari bilangan aksara dalam rentetan, fungsi mana yang digunakan?*

- A. strlen()
- B. str\_len()
- C. getlength()
- D. stringlength()

12. Which of the following is used to create a stream that performs both input and output operations?

*Antara berikut, yang manakah digunakan untuk membuat aliran yang melakukan operasi input dan output?*

- A. ofstream
- B. ifstream
- C. fstream
- D. iostream

13. What will be the output of the following C++ code in the text file?

*Apakah output kod C ++ berikut dalam fail teks?*

- A. ADC
- B. ABC
- C. ABCD
- D. ABCDE

```
#include <iostream>
using namespace std;
int main()
{
 FILE * pFile;
 char c;
 pFile = fopen("sample.txt", "wt");
 for (c = 'A'; c <= 'E'; c++)
 {
 putc (c, pFile);
 }
 fclose (pFile);

 return 0;
}
```

14. Which of the following accesses the seventh element stored in array?

*Antara berikut, yang manakah mengakses elemen ketujuh yang disimpan dalam susunan?*

- A. array;
- B. array[6];
- C. array[7];
- D. array[seven];

15. What is the output the following code?

*Apakah output kod berikut?*

- A. SUM= 15 SUM= 15
- B. SUM= 30 SUM= 30
- C. SUM= 15 SUM= 30
- D. SUM= 30 SUM=15

```
#include <iostream>
using namespace std;
int sum(int,int);
int main()
{
 int a=5, b=10, mysum;
 mysum = sum(a,b);
 cout << "SUM= " << mysum;
 cout << " SUM= " << sum(10,20);
 return 0;
}

int sum(int i, int j)
{
 return (i+j);
}
```

**ANSWER SECTION / RUANGAN JAWAPAN**

| <b>Answers for Section A [10M]</b><br><i>Jawapan untuk Bahagian A:</i> |                        |
|------------------------------------------------------------------------|------------------------|
| <b>Question / Soalan</b>                                               | <b>Answer/ Jawapan</b> |
| 1                                                                      |                        |
| 2                                                                      |                        |
| 3                                                                      |                        |
| 4                                                                      |                        |
| 5                                                                      |                        |
| 6                                                                      |                        |
| 7                                                                      |                        |
| 8                                                                      |                        |
| 9                                                                      |                        |
| 10                                                                     |                        |

| <b>Answers for Section B [30M]</b><br><i>Jawapan untuk Bahagian B:</i> |                        |
|------------------------------------------------------------------------|------------------------|
| <b>Question / Soalan</b>                                               | <b>Answer/ Jawapan</b> |
| 1                                                                      |                        |
| 2                                                                      |                        |
| 3                                                                      |                        |
| 4                                                                      |                        |
| 5                                                                      |                        |
| 6                                                                      |                        |
| 7                                                                      |                        |
| 8                                                                      |                        |
| 9                                                                      |                        |
| 10                                                                     |                        |
| 11                                                                     |                        |
| 12                                                                     |                        |
| 13                                                                     |                        |
| 14                                                                     |                        |
| 15                                                                     |                        |

SECTION C: STRUCTURE [45 MARKS]

BAHAGIAN C: STRUKTUR [45 MARKAH]

Instruction: Write your answers in the spaces provided in attachment answer script.

Arahan: Tuliskan jawapan di ruang yang disediakan di dalam kertas jawapan yang di lampirkan.

QUESTION 1 / SOALAN 1

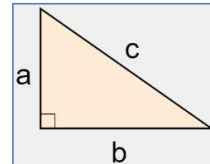
a) Base on the given instruction, write the suitable C++ statements.

[5M]

The **hypotenuse** is opposite the right angle and can be solved by using the Pythagorean Theorem where the formula to find the hypotenuse is

Berdasarkan pada arahan yang diberi, tulis pernyataan C++ yang sesuai.

Hipotenus berlawanan dengan sudut kanan dan dapat diselesaikan dengan menggunakan Teorem Pythagoras di mana formula untuk mencari hipotenus adalah



$$c = \sqrt{a^2 + b^2}$$

```

//*****
// Program to calculate the hypotenuse of a triangle. User
// have to input the height and base of the triangle and
// use the theorem Pythagoreen to display the value of hypotenuse.
//*****

#include <iostream>
#include <math.h>
using namespace std;

int main ()
{
//define a to store integer value for height,
//b to store integer value for base and
//c to store integer value for hypotenuse

i

cout << "Enter triangle height: ";
// read user input and store in a

ii

cout << "Enter triangle base: ";
// read user input and store in b

iii

//calculate c, refer to formula to find the hypotenuse

iv

//display "Triangle with height a and base b, the hypotenuse is c

v

return 0;
}

```

b) What is the output when the following code fragment is executed?

[2M]

Apakah output apabila keratan kod berikut dilaksanakan?

```

int i = 18, j = 7, k = 3, n = 4;
cout << (i + j / k - k * n) << endl;
cout << (j % n / 2) << endl;

```



**QUESTION 2 / SOALAN 2**

- a) Using **for** loop please write code fragment produce output as below: A list of even number start from 4 until 10 that added each of it with 3. [3M]

*Menggunakan gelung **for** sila tuliskan keratan kod yang menghasilkan keluaran seperti di bawah:*

*Senarai nombor genap bermula dari 4 hingga 10 yang ditambahkan masing-masing dengan 3.*

Output / Keluaran

7 9 11 13

- b) Identify TWO (2) errors in the **if** statement below and make correction on the indicated statements. [2M]

*Kenalpasti DUA (2) kesalahan di dalam pernyataan **if** di bawah dan lakukan pembetulan ke atas pernyataan yang dimaksudkan.*

```
int i = 3, j = 5;
if (i = j)
 cout << "Same ";
 cout << "people.";
else
 cout << "Different ";
 cout << "person.";
```

- c) What output will be produced by the following code? [2M]

*Apakah output yang akan dihasilkan oleh kod berikut?*

```
int x=10, y=0;
if (x > 0)
 y = y + 1;
else if (x < 0)
 y = y + 2;
else
 y = y + 5;
cout << x << " " << y;
```

- d) Transform the **if** statement program below into a **switch** statement. [3M]

*Tukarkan pernyataan **if** di dalam program di bawah kepada pernyataan **switch**.*

```
#include <iostream>
using namespace std;
int main () {

// local variable declaration:
char grade = 'D';

if ((grade=='A') || (grade=='a'))
{ cout << "Excellent!" << endl; }

if (((grade=='B') || (grade=='b')) || ((grade=='C') || (grade=='c')))
{ cout << "Well done" << endl; }

if ((grade=='D') || (grade=='d'))
{ cout << "You passed" << endl; }

if ((grade=='F') || (grade=='f'))
{ cout << "Better try again" << endl; }

else
{ cout << "Invalid grade" << endl; }

cout << "Your grade is " << grade << endl;
return 0; }
```

e) What output will be produced by the following code?

[5M]

Apakah output yang akan dihasilkan oleh kod berikut?

```
int i = 32;
while (i<60){
 i=i+3;
 if (i==47)
 continue;
 if (i==53)
 break;
 cout << i << endl;
}
```

### QUESTION 3 / SOALAN 3

a) Given the following function.

Diberi fungsi berikut.

```
int fungsi(int p, int q, char c){
 int n=0, i, j=1;
 switch(c){
 case '+': for (i=p; i<=q; i++)
 n+=q;
 return n;
 case '*': for (i=p; i<=q; i++)
 j*=i;
 return j;
 case '^': for (i=0; i<q; i++)
 j = j*p;
 return j;
 }
 return -1;
}
```

What output will be produced by the following code?

[6M]

Apakah output yang akan dihasilkan oleh kod berikut?

i. cout << fungsi(5, 5, '^');

ii. cout << fungsi(12, 14, '+');

iii. cout << fungsi(2, 6, '\*');

- b) What will be the output produced by the following code?

[3M]

*Apakah output yang akan dihasilkan oleh kod berikut?*

```
int main(){
 float a=3.5, b=6.1, c=8.2;
 calculation(a,b,c);
 c=c*10;
 cout << "a=" << a << " b=" << b << " c=" << c;
 return 0;
}

void calculation(float m, float &n, float &p){
 p = m + n;
}
```

- c) What output will be produced by the following code?

[2M]

*Apakah output yang akan dihasilkan oleh kod berikut?*

```
cout << myFunction(7);
```

```
int myFunction(int n){
 int sum=0, i=n;
 while (i > 3){
 sum = sum + i;
 i = i - 3;
 }
 return sum;
}
```

#### QUESTION 4 / SOALAN 4

- a) Declare an array type **double** named **temperature** to store five element value where the input values in the array is 36.8, 35.2, 38, 36.5, 37.9 [1M]

*Isytiharkan satu tatasusunan berjenis **double** bernama **temperature** untuk menyimpan lima nilai elemen dimana nilai input dalam tatasusunan 36.8, 35.2, 38, 36.5, 37.9*

- b) Write statements to display the average value in array **temperature** above. [4M]

*Tulis pernyataan-pernyataan untuk memaparkan nilai purata dalam tatasusunan **temperature** di atas.*

- c) Refer to above array **temperature**, write a statements to switch between third and fifth item value in array. (where the fifth element will be 38 and the third element will be 37.9) [3M]

*Rujuk pada tatasusunan **temperature** di atas, tulis pernyataan untuk menukar antara nilai item ketiga dan kelima dalam susunan. (di mana elemen kelima akan menjadi 38 dan elemen ketiga adalah 37.9)*

d) Write the output of the program fragment below:

[2M]

*Tuliskan output keratan aturcara di bawah:.*

```
enum week {SUN, MON, TUE=4, WED, THU, FRI, SAT};
enum week day1, day2;
day1 = FRI;
day2 = MON;

cout << day1 << " " << day2;
```

e) Write the output of the program fragment below:

[2M]

*Tuliskan output keratan aturcara di bawah:.*

```
int i=10, j=8;
int *p, *q;
p=&i;
*p=*p+3;
q=p;
*p=*p+j;
p=&j;
cout << *p << " " << *q;
```

**SECTION D: PROGRAMMING [15 MARKS]**

**BAHAGIAN D: PENGATURCARAAN [15 MARKAH]**

**Instruction: Write your answers in the spaces provided in attachment answer script.**

**Arahan: Tuliskan jawapan di ruang yang disediakan di dalam kertas jawapan yang di lampirkan.**

---

Write a complete program.

*Tuliskan satu aturcara lengkap.*

**PROGRAM 1 / ATURCARA 1**

**[10M]**

Write a complete program for **Pau Ahmad**. Based on the pricing schedule below, this program is required to accept a selection of types of packages to buy. The program should take orders as long as it is needed. This program will reflect the number of purchases you have made. Discount 10 percent will be given for purchases over RM10. Display output as below.

*Tulis aturcara lengkap untuk **Pau Ahmad**. Berdasarkan jadual harga pau di bawah, aturcara ini dikehendaki menerima pilihan jenis pau yang hendak dibeli. Aturcara perlulah mengambil pesanan selagi ia diperlukan. Aturcara ini akan menggira jumlah pembelian yang telah dibuat. Diskaun sebanyak 10 peratus akan diberi untuk pembelian yang melebihi rm10. Paparkan keluaran seperti di bawah.*

| Type of Pau<br>Jenis Pau | Price / Harga<br>(RM) |
|--------------------------|-----------------------|
| A – Chicken Pau          | 3.00                  |
| B – Meat Pau             | 3.20                  |
| C – Kaya Pau             | 1.80                  |
| D – Red Bean Pau         | 2.50                  |

Table 2 / Jadual 2

**OUTPUT**

```
****Welcome To Pau Ahmad****
Type of Pau:
 A – Chicken Pau
 B – Meat Pau
 C – Kaya Pau
 D – Red Bean Pau
*You will get 10% discount for every purchase more than RM10
Insert your choice (A/B/C/D): A
Insert quantity: 4
Want to add another order? (y=yes/n=no): y

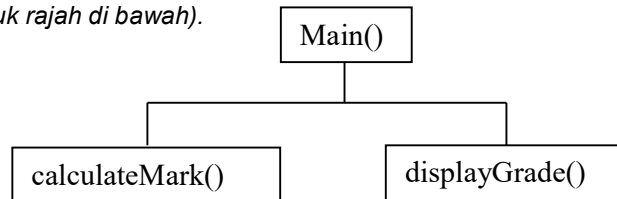
****Welcome To Pau Ahmad****
Type of Pau:
 A – Chicken Pau
 B – Meat Pau
 C – Kaya Pau
 D – Red Bean Pau
*You will get 10% discount for every purchase more than RM10
Insert your choice (A/B/C/D): d
Insert quantity: 2
Want to add another order? (y=yes/n=no): N
```

**PROGRAM 2 / ATURCARA 2**

**[5M]**

Write a complete program to calculate mark and display grade of students. Your program must involve functions (refer the diagram below).

*Tulis program lengkap untuk mengira markah dan memaparkan gred pelajar. Aturcara anda mesti melibatkan fungsi (rujuk rajah di bawah).*



Function **main()** will ask user to read carry mark and final mark (valid value for carry mark and final mark is between range 0 to 50). Both of the value will be sent to **calculateMark()** where inside this function both of the value will be add and statement passed will be display if the total mark is more or equal than 60 or else it will display failed. Function **calculateMark()** will return total mark.

After receive total mark from **calculateMark()**, the total mark will be sent to **displayGrade()**. In function **displayGrade()**, grade will be display based on the table below.

*Fungsi **main()** akan meminta pengguna membaca markah kerja kursus dan markah akhir (nilai sah untuk markah kerja kursus dan markah akhir adalah antara julat 0 hingga 50). Kedua-dua nilai akan dihantar kepada **calculateMark()** di mana dalam fungsi ini kedua-dua nilai akan ditambahkan dan pernyataan yang lulus akan dipaparkan jika jumlah markah lebih atau sama dengan 60 atau sebaliknya akan dipaparkan gagal. Fungsi **calculateMark()** akan mengembalikan jumlah markah.*

*Setelah menerima jumlah markah dari **calculateMark()**, jumlah markah akan dihantar ke **displayGrade()**. Dalam fungsi **displayGrade()**, gred akan dipaparkan berdasarkan jadual di bawah..*

| Total Mark<br>Jumlah Markah | Grade<br>Gred |
|-----------------------------|---------------|
| > = 85                      | A             |
| 70 - 84                     | B             |
| 60 - 69                     | C             |
| < 60                        | E             |

Example Output:

```
Insert carry mark: 24
Insert final mark: 60
Insert final mark: 35
 Result : FAILED
 Grade : E
Exit Program?(0=yes, 1=no): 1

Insert carry mark: 45
Insert final mark: 32
 Result : PASSED
 Grade : B
Exit Program?(0=yes, 1=no): 0

```

**- END OF QUESTIONS/ SOALAN TAMAT-**