Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2015/2016

COURSE NAME	:	COMPUTER PROGRAMMING
COURSE CODE	:	BFC 20802
PROGRAMME	:	BACHELOR OF CIVIL ENGINEERING WITH HONOURS
EXAMINATION DATE	:	DECEMBER 2015 / JANUARY 2016
DURATION	:	2 HOURS 30 MINUTES
INSTRUCTION	:	1. ANSWER ALL QUESTIONS IN SECTION A AND B. 2. CHOOSE ONLY **ONE (1)** QUESTION IN SECTION C 3. PROVIDE YOUR ANSWER IN THE ANSWER BOOKLET

THIS QUESTION PAPER CONSISTS OF **TEN (10)** PAGES

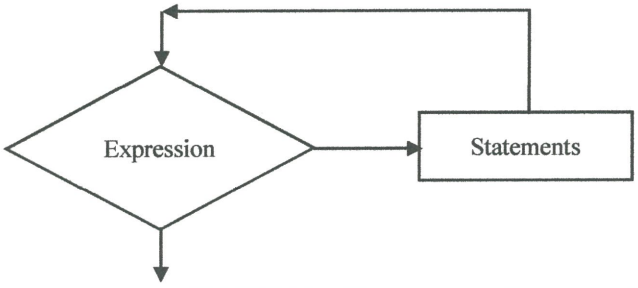
SECTION A

Instruction: Answer **T (True)** or **F (False)**.

(10 marks)

	Questions	TRUE	FALSE
a	>>, ;, <<, cout, cin are key words for a programming language.		
b	Random Access Memory (RAM) is volatile where it is erased when the program terminates		
c	The operator OR (||) is used where a new rational expression is true if both expressions are true.		
d	The following symbol is a decision symbol where it is used to represent operations in which there are two possible selections 		
e	Given x = 100, the answer to the expression x/(100/%10)+x is 100.		

f	The following code will not give an error.
	Int main ()
	{
	char name [21];
	cout << My name is;
	cin >> name;
	cout << Good day to you Mr << name << endl;
	return 0;
	}		

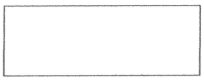
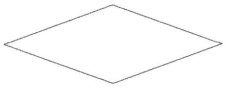
g	The flowchart of a while lope is as shown 		
h	A runtime error appears if the program produces incorrect result but it compiles fine. (FALSE)		
i	Binary numbers are 1010100001010.		
j	The 'if' statement allows statement to be conditionally executed or skipped over.		

SECTION B

Instruction: Answer **ALL** questions.

Q1 Name the symbols of the flowchart as below:

(5 marks)

Symbol	Answer
	
	
	
	
	

Q2 Write a single C++ statement or line that accomplishes each of the following:

(a) Assign the division operator of variables P and A to variable σ.

(1 mark)

(b) Print the message "Total for three digits".

(1 mark)

(c) Instead of a = a + 1, we can write using increment operator as _____.

(1 mark)

(d) Input four integer values from the keyboard into integer variables a, b, c and d.

(1 mark)

(e) Add x with 2, double it and stored into y.

(1 mark)

Q3 Explain briefly how computer run the program, in order from start to end.

(8 marks)

Q4 Label the function of each C++ statement as below:

Statement	Function
# include <iostream > using namespace std;	
/ / A typical C++ Program	
main ( )	
{ Variables declaration …….. ; Statements;	
}	

(5 marks)

Q5 Identify and correct the error(s) in each of the following:

(a)
```
int main();
{
    int a;
    cout << "Insert one integer:";
    cin>>a;
}
```
(2 marks)

(b)
```
if ( b > 0 );
{
    cout >> "The number that has been inserted is positive" << endl;
 }
```
(2 marks)

(c)
```
#include <isostream>
using namspace std;
int Main()
     {
```
(2 marks)

(d)
```
while (x < 10)
}
    cout >> "t\t" << x << "/n";
```
(2 marks)

(e)
```
for (i == 0; i <= n; i++)
{
     increment  = increment –i;
 }
```
(2 marks)

(f)
```
main (void);
{
   char a[10];
   cout << "insert your name:";
   cin >> a;
   cin.ignore();
```

(2 marks)

Q6 Write a single C++ statement or line that accomplishes each of the following:

(a) An expression that uses a relational operator to return TRUE if the variable *Ahmad* is not equal to *Ali*.

(1 mark)

(b) A WHILE loop that will display the *numbers* from 500 to 550.

(1 mark)

(c) Declare a constant YIELD_STRENGTH inside a function with value 30

(1 mark)

(d) What is the output of the following code?

```
bool even = false;
cout << (even ? "true" : "false") << endl;
```

(1 mark)

(e) Print a statement that prompt "$b^2 - 4ac$".

(1 mark)

Q7 Fill in the blank with the correct answer:

(10 marks)

```
#include <___i____>
using ____ii____ std;

int __iii___()
{
        __iv__ hours, rate, pay;
        // Get the number of hours worked.
        __v__ << "How many hours did you work? ";
        cin >> hours;

        // Get the hourly pay rate.

        cout << "How much do you get paid per hour?";

        __vi__ >> rate;

        // Calculate the pay.

        pay = hours * __vii__; // Display the pay.

        __viii__<< "You have earned $" << pay << endl;
        system ("__ix__");
        __x__ 0;
}
```

Q8 Fill in the blank with the correct answer:

(10 marks)

```
#include <___i____>
#include <___ii____>
#include <___iii____>
using namespace std;
int main()
{
        float new_sigma, new_tau, __iv__, __v__, P;
        _vi_ cos_value = cos(theta);
        float sin_value = sin(theta);

        cout<<"Enter value of P : \n";
        cin>>P;

        cout<<"Enter value of A1 : \n";
        __vii__>>A1;

        cout<<"Enter value of theta : \n";
        cin>>theta;

        new_sigma=P*cos(theta)*___viii___/A1;
        cout<<"answer, new_sigma = \n"<<new_sigma<<"\n"<<"\n";
        __ix__;

        cout<<"Enter value of P : \n";
        cin>>P;

        cout<<"Enter value of A1 : \n";
        cin>>A1;

        cout<<"Enter value of theta : \n";
        cin>>theta;

        new_tau=P*sin(theta)*cos(theta)/A1;
        __x__<<"Answer, new_tau = \n"<<new_tau<<"\n";

        System ("PAUSE");
        return 0;
}
```

SECTION C

Instruction: Choose **ONE (1)** question only.

Q1 Construct i) a **pseudocode** based on the **flowchart** (refer to Figure **Q1**) and write ii) a **complete C++ code** which will ask user to travel from Ayer Hitam to southern inbounds using the PLUS Highway. The program will display the destinations, toll rates and distances according to the selection by the user. **Example of Output:** refer to Figure **Q1**.

(30 marks)

Q2 A stone is thrown upwards with an initial velocity (u) of 30 m/s. The maximum peak the stone could reach is calculated by the following calculation and conditions. The acceleration, $a = g = -9.81$ m/s^2

The distance,
$$s = \frac{v^2 - u^2}{2a} = \frac{0^2 - 30^2}{2(-9.81)} = 45.87\,m/s \quad \text{(i)}$$

Then from the moment the stone is thrown upwards, the time needed for the stone to retouches the earth surface is calculated according to the following condition

Time needed to retouch the surface
$$t = \frac{-u \pm \sqrt{u^2 - 4as}}{a} = \frac{-30 \pm \sqrt{30^2 - 4(-9.81)(0)}}{-9.81} = 6.12s \quad \text{(ii)}$$

The total time requires for the stone to retouch the surface from the moment it is thrown upwards is given as 6.12s. Within 6 seconds, the movement of the stone is illustrated as a quadratic path and the displacement of the stone from the peak is shown in the following table.

By referring the following equation, the calculation for the displacement could be achieved by using a calculation loop.
$$s = ut + \frac{1}{2}at^2 \quad \text{(iii)}$$

The program will display the distance, time needed to reach the peak and the displacement of the stone within 6 iterations or seconds.

(a) Construct a **pseudocode** of a **flowchart**.

(b) Write a **complete C++ code** to calculate the condition as instructed in a), b) and c).

(30 marks)

-END OF QUESTION –

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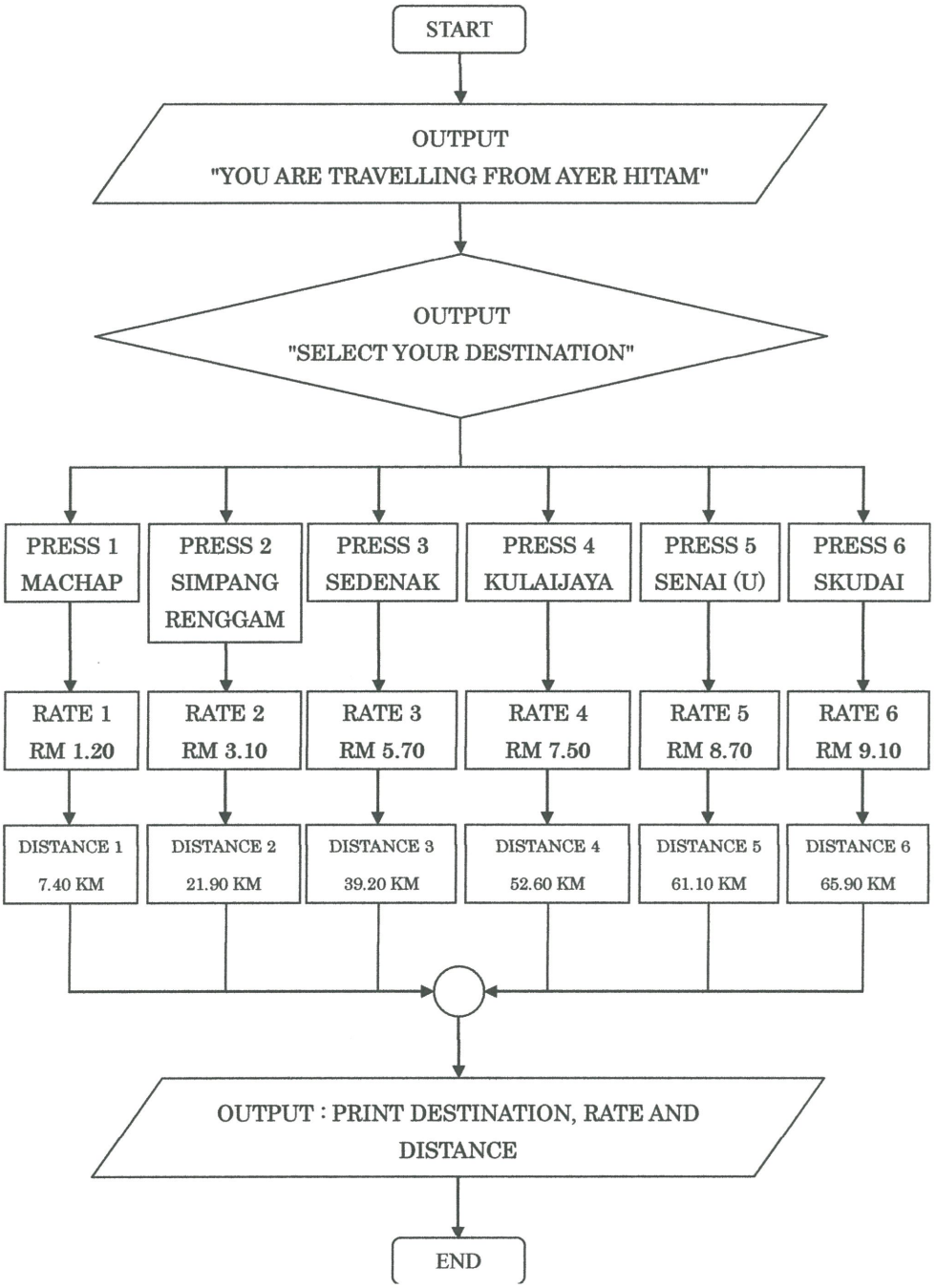

FIGURE Q1

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TABLE 1

Time (second)	Displacement (meter)
1	25.095
2	40.380
3	45.855
4	41.520
5	27.375
6	3.420

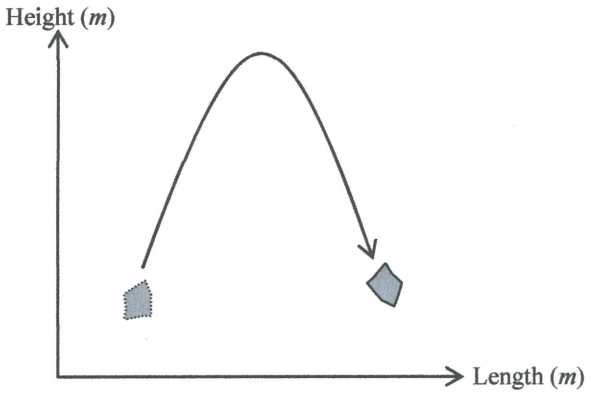

FIGURE Q2