

**UNIVERSITI TUN HUSSEIN ONN MALAYSIA****FINAL EXAMINATION  
SEMESTER II  
SESSION 2016/2017**

COURSE NAME : COMPUTER PROGRAMMING  
COURSE CODE : BNR 20803  
PROGRAMME CODE : BND / BNF  
EXAMINATION DATE : JUNE 2017  
DURATION : 3 HOURS  
INSTRUCTION : ANSWER ALL QUESTIONS

THIS PAPER CONSISTS OF SIX (6) PAGES

- Q1 (a) Computer can be categorized into personal computer and embedded computer system. A computer works by manipulating data based on a list of instruction.
- (i) Explain the differences between personal computer and embedded computer. (2 marks)
  - (ii) Outline **TWO (2)** examples for each categories. (4 marks)
  - (iii) Explain the function of register in CPU (4 marks)
- (b) Design a pseudocode for smart car assistant program that are able to measure or sense a car speed in miles per hour (mph). Then, program will convert the speed in mph to kilometer per hour (kph). The program also should display the speed in kph. If the driver exceed the speed limit of 110kph, program will warn the driver through the display with the message "please reduce speed". (6 marks)
- (c) Illustrate the display output for the main() function given below.

```
#include <iostream>
using namespace std;
int main()
{
    int x=7,y=5;
    cout<< x++ <<endl;
    cout<< ++x <<endl;
    cout<< --y <<endl;
    cout<< y <<endl;
}
```

(4 marks)

**Q2** (a) Identifier are the symbol or variable name that will be used in a programs to identify various entities such as integer, floating point number, character and many more. State whether below identifier are valid identifier or not. Provide the reason for your answer.

(i) `_60Speed`

(2 marks)

(ii) `Your step`

(2 marks)

(b) Preprocessor works to modify text of the source code before compiler starts. In a program, this take place before the `main()` function. Discuss the definition of the preprocessor and its purposes.

(4 marks)

(c) The following program has errors.

```
/This program will calculate voltage, resistance, and current using Ohm's law.
```

```
#includes<iostraem>
```

```
Using namespace std;
```

```
int main()
```

```
{
```

```
    doubles voltage, resistance, current;
```

```
    cout <<"This part of the program will calculate voltage"<<endl;
```

```
    resistance = 8;
```

```
    current = 4;
```

```
    cout <<"The voltage is "<<resistance*current<<" volts"<<endl;
```

```
    cout <<"This part of the program will calculate resistance"<<endl;
```

```
    voltage = 32;
```

```
    cout >>"The resistance is "<<voltage/current<<" ohms"<<endl;
```

```
    cout <"This part of the program will calculate current"<<endl;
```

```
    cout <<"The current is "<<voltage/resistance<<" amperes"<<endl;
```

```
    return 0;
```

```
}
```

Identify the errors and rewrite the correct program code.

(12 marks)

- Q3 (a) Operator is needed for calculation and selection (logic decision) as well as condition. Operator can be defined as expression or evaluation of certain value or condition to achieve final value. Discuss the differences between assignment operator and arithmetic operator. (4 marks)
- (b) A function is a group of statement that is used to perform a task. Every C++ program has at least one function, which is main(), and all the most trivial program can define additional function. Discuss the categories of function in C++ programming. (4 marks)
- (c) C++ program below runs a mathematical operation. Determine the value of a, b, c, d and sum by showing step by step estimation for every line involved. Illustrate the exact display output screen based on above C++ program.

```
#include <iostream>
using namespace std;
int main()
{
    int a=2, b=1, c=4, d=6, sum=12;
    b -= a * c;
    d = c %= 2;
    sum += 7 % a-- + --c / ++d;
    cout << "\nthe sum is \t" << sum << endl;
    cout << "\nValue a =\t" <<a;
    cout << "\nValue b =\t" <<b;
    cout << "\nValue c =\t" <<c;
    cout << "\nValue d =\t" <<d<<"\n";
    return 0;
}
```

(12 marks)

- Q4** As a software engineer, you are assigned to develop a program for your company, which is to design and manufacture an air conditioning (air-cond) product. The product will operate with the functions as described below;
- Able to receive input of desired temperature ( $T_d$ ) from user.
  - Product will repeatedly sense room temperature ( $T_r$ ) automatically during power ON (power = 1) and adjust the blower function accordingly.
  - If  $T_r > T_d$ , air-cond will blow cold air to reduce the temperature in the room.
  - Air-cond will stop blowing cold air if  $T_r \leq T_d$ .
  - Assume blower = 1 as an air-cond blowing cold air.

Based on the functionality mentioned above, provide your solution as on the question below;

- (a) Determine input, output and process required for the above program (problem definition). (3 marks)
- (b) Design and propose the algorithm that represent above function (7 marks)
- (c) Based on your solution in **Q4(b)**, Write C++ program. (10 marks)



- Q5 (a) Outline the advantages and disadvantages of an arrays compared to variables without the use of an arrays. (6 marks)
- (b) Write C++ program that can accept any, n number of score. Then, program will display average score at the end. Your input score should be stored using array function. (8 marks)
- (c) Pointer is a variable that hold a memory address. Based on the given program below, predict the display output when program were executed in the computer. Your solution should include the steps how you get the answer.

```
#include <iostream>
using namespace std;
int main()
{
    int a1 = 25,a2=10;
    int *b1, *b2;

    b1=&a1; //address for a1 = 0x28ff04
    b2=&a2; //address for a2 = 0x28ff00

    *b1=10;
    b1=b2;
    *b1=25;

    cout << "\nvalue a1 : " << a1;
    cout << "\nvalue a2 : " << a2;
    return 0;
}
```

(6 marks)

- END OF QUESTIONS -