UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2011/2012

COURSE NAME	:	COMPUTER PROGRAMMING
COURSE CODE	:	BEC 10102 / BEX 10302 / BEE 1212
PROGRAMME	:	BEF / BEH / BEE
EXAMINATION DATE	:	JUNE 2012
DURATION	:	2 HOURS 30 MINUTES
INSTRUCTIONS	:	PLEASE ANSWER :
		• **ALL** QUESTIONS IN **PART A** AND **PART B**; AND
		• ANY **ONE (1)** QUESTION IN **PART C**

THIS PAPER CONSISTS OF **THIRTEEN** (13) PAGES

PART A: QUESTION 01 (10 marks)

Q1. In Table Q1, for each term in the column on the left, write the corresponding letter for the description that best matches it from the column on the right.

(10 marks)

Table Q1

Term	Description
(1) Stream insertion operator	(a) Used to choose among alternative courses of action.
(2) Selection structure	(b) "Manufacturing" section of a computer. Performs calculations.
(3) Sentinel	(c) "Administrative" of computers.
(4) Dereferencing operator	(d) Invokes a function.
(5) High-level language	(e) Among popular sorting techniques but run slowly with large arrays.
(6) CPU	(f) *
(7) ALU	(g) >>
(8) Repetition structure	(h) Allows programmers to specify an action to be repeated while some condition is true.
(9) Bubble sort	(i) Programming language, like C and C++, in which simple statements accomplish substantial task.
(10) Function call	(j) Special value which indicates the end of data entry.

PART B: QUESTION 02 - 20 (30 marks)

Q2.   There are six (6) steps to be executed in the software development method (SDM) as follows:

Requirement specification → (2) → (3) → (4) → (5) → (6)

What are the processes for → (2) → (3) → (4) → (5) → (6)?

(1 mark)

A.   → (design) → (analysis) → (implementation) → (testing) → (verification)
B.   → (analysis) → (design) → (implementation) → (testing) → (verification)
C.   → (research) → (design) → (implementation) → (testing) → (verification)
D.   → (design) → (analysis) → (implementation) → (testing) → (verification)

Q3.   As a programmer, you are required to solve three (3) types of errors. Recognise these three (3) errors.
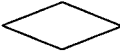
i.   Typical error
ii.   Logical error
iii.   Runtime error
iv.   Notation error
v.   Syntax error
vi.   Compilation error

(1 mark)

A.   i, ii and iii
B.   ii, iii and iv
C.   ii, iii and v
D.   iv, v and vi

Q4.   Choose the symbol that indicates the initial, final and increment values of a loop.

(1 mark)

A.
B.
C.
D.

Q5. Comments are for the reader, not for the compiler. Identify the best description related with comments.

    i.   to identify the authors of the program
    ii.   to accelerate the process of compilation
    iii. to give a brief explanation of the program
    iv. to explain the meaning of key statements in a program

(1 mark)

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

Q6. What are the description of single line comments?

    i.   begin with // and can placed anywhere in the line
    ii.   begin with /* and can placed anywhere in the line
    iii. everything encountered in that line after // is ignored by the compiler
    iv. everything encountered in that line after /* is ignored by the compiler

(1 mark)

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

Q7. Which of the following is a legal C++ identifier?

(1 mark)

    A. UTHM_Johor
    B. UTHM-Johor
    C. UTHM Johor
    D. _UTHM Johor

Q8. Which of the following program segment that describes the process to turn on LED when LDR reading is equal to 0?

(2 marks)

```
A.  cin >> LDR;        B.  cin >> LDR;
    if (LDR = 0)           if (LDR == 0)
          LED = 1;               LED = 1;


C.  cin << LDR;        D.  Cin >> LDR;
    if (LDR = 0)           if (LDR == 0);
          LED = 1;               LED=1;
```

Q9. Suggest the program segment to generate the following output.

```
C++ is fun.
The output of
a+b is 13.
Press any key to continue
```

```
i.   int a=5, b=8;
     cout << "C++ is fun." << endl;
     cout << "The output of" << endl;
     cout << "a+b is" << a+b << '.' << endl;


ii.  int a=5, b=8;
     cout << "C++ is fun. \n";
     cout << "The output of ";
     cout << "a+b is " << a+b << '.';


iii. int a=5, b=8;
     cout << "C++ is fun. " << endl;
     cout << "The output of a+b is " << a+b << '.' << endl;


iv.  int a=5, b=8;
     cout << "C++ is fun. \n ";
     cout << "The output of a+b is " << a+b << '.' << endl;
```

(2 marks)

A. i and ii
B. ii and iii
C. i, iii and iv
D. All of the above

Q10. If x = 6, which statement that can update the value of x to 9?

(2 marks)

    A.   `x *= 3;`
    B.   `x += 3;`
    C.   `x =+ 3;`
    D.   `x + 3 = x;`

Q11. Predict the output of a and b for the following program.

```
#include <iostream>
using namespace std;
main()
{
int x = 10, y = 15, a, b;
a = x++;
b= ++y;
cout << a;
cout << b;
}
```

(2 marks)

    A.   a = 11, b = 15
    B.   a = 10, b = 16
    C.   a = 11, b = 16
    D.   a = 11, b = 15

Q12. What is the selection structure in the following program?

```
#include <iostream>
using namespace std;
void main()
{
        int choice;
        int x = 1;

        /* get input from the user */
        cout<<"Please type a number < 1 to 10 >: ";
        cin>>choice;

//determine the x value
if (choice <= 3 )
        x += 5;
else if (choice <= 5 )
        x += 10;
else if (choice <= 7 )
        x += 15;
else
        x += 20;

//display the current value of x
cout<<"Current value of x is "<< x;
}
```

(2 marks)

    A.   `if` selection (single-selection structure)
    B.   `if-else` (single-selection structure)
    C.   `if-else` selection (multiple-selection structure)
    D.   `switch` selection (single-selection structure)

Q13. Recommend the accurate transformation from `switch` to `if-else` statement selection structure for the following program segment.

```
switch (x)
{
  case 'a':
    cout<<"x is a";
    break;
  case 'b':
    cout<<"x is b";
    break;
  default:
    cout<<"value of x is unknown";
}
```

(2 marks)

```
A.  if (x == 'a')
        cout<<"x is a";
    else if (x == 'b')
        cout<<"x is b";
    else
        cout<<"value of x is unknown";


B.  if (x == "a")
        cout<<"x is a";
    else if (x == "b")
        cout<<"x is b";
    else
        cout<<"value of x is unknown";


C.  if (x == 'b');
        cout<<"x is b";
    else if (x == 'a');
        cout<<"x is b";
    else;
        cout<<"value of x is unknown";


D.  if (x == 'a')
        cout<<"x is a"
    else if (x == 'b')
        cout<<"x is b"
    else
        cout<<"value of x is unknown"
```

Q14. What are the expected results for X, Y and Z in the following program segments?

Program segment	`i=0;`
	`while (i<=20)`
	`{`
	`    cout << i << " ";`
	`    i += 5;`
	`}`
	`cout << endl;`
		`i=0;`
		`while (i<=20)`
		`{`
		`    i += 5;`
		`    cout << i << " ";`
		`}`
		`cout << endl;`
			`i=0;`
			`while (i<=20);`
			`{`
			`    cout << i << " ";`
			`    i += 5;`
			`}`
			`cout << endl;`

Output	X	Y	Z

(2 marks)

	X	Y	Z
A.	5 10 15 20 25	5 10 15 20 25	
B.		5 10 15 20	5 10 15 20 25
C.	0 5 10 15 20	5 10 15 20 25	
D.	0 5 10 15 20	5 10 15 20 25	5 10 15 20 25 30

Q15. For the following function definition, predict the return value returns by `calculateA` when it receives value of 2 from the caller function.

```
int calculateA (int y) {
        y = y + 1;
        y = calculateB(y);
        return y;
}

int calculateB(int x) {

        x = pow(x,3);
        return x;
}
```

(2 marks)

A. 6
B. 8
C. 25
D. 27

Q16. Evaluate the following program and suggest the library function needed to execute this program properly.

```
#include <iostream>
using namespace std;
void a_character(char ac);
void main() {
char a_char;

cout << "Enter a character:";
cin >> a_char;
a_character(a_char);
cout<< "Thank you." << endl;
}

void a_character(char ac) {
ac = tolower (ac);
if (ac == 'b')
cout<< setw(7) << ac << "is b"<<endl;
else
exit(1);
}
```

i.   #include <ccytpe>
ii. #include <cstdlib>
iii. #include <iomanip>
iv. #include <cstring>

(2 marks)

A.   i and ii
B.   i, ii and iii
C.   ii, iii and iv
D.   All of the above

Q17. What are the procedures involve for file I/O operations?

i.   create a file
ii. write data to file
iii. read data from file
iv. analyse data from the file

(1 mark)

A.   i and ii
B.   i, ii and iii
C.   ii, iii and iv
D.   All of the above

Q18. What are the steps required to work with file?

    i.   declare input/output file stream variable
    ii. create file using `fopen()` function
    iii. perform I/O operation
    iv. close data file using `fclose()` function

                                                           (1 mark)

    A. i and ii
    B. i, ii and iii
    C. ii, iii and iv
    D. All of the above

Q19. Choose the correct array declaration format.

    i.   `int noOFdata[];`
    ii. `char bedNo[10], carNo[10];`
    iii. `double sectionMarks[]={60.9, 70.4, 90};`
    iv. `float test1Mark[9]; test2Mark[9]; finalMark[9];`

                                                           (2 marks)

    A. i and ii
    B. i, ii and iii
    C. ii, iii and iv
    D. None of the above

Q20. For the following definition, identify the size of array b.

```
int b[]={'D', 'E', 'C', '\0'};
```

                                                           (2 marks)

    A. Unspecified
    B. 4
    C. 5
    D. Invalid array declaration

PART C: QUESTION 21 - 22 (40 marks)

Q21 (a)   Briefly comment what each line of the following code does.
         (i)   `int a[4] = {10, 20, 30, 40};`
         (ii)   `int* p; int * q;`
         (iii) `p = new int;`
         (iv)   `*p = 55;`
         (v)   `q = a;`

(10 marks)

   (b)   For each of the following library, give a brief description of the library and its function. Then give an example of a function in the library and what it does.
         (i)   `<cmath>`
         (ii)   `<iostream>`

(6 marks)

   (c)   The following program segment contains an error. Correct the error.

```
int size = 20;
char letters [size];
for (int i=0; i<size; i++)
letters[i] = 'J';
```

(4 marks)

   (d)   Write a full program, starting from `#include`, that gets the name of a text file from the user. The program then reports the longest and shortest word in the file. In the case when there is a tie for the shortest/longest word, report the word that occurs first. You may assume that punctuation contributes to the length of the word, so that "hi!!!!!!" is a longer word than "hello". Your output should shows double quotes " " around the word. Your answer should not require arrays or vectors.

A sample run is shown as follows for the given input file `input.txt` at right.

```
Enter file name: input.txt
The longest word is "destinations!!!".
The shortest word is "a".
```

(20 marks)

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Q22 (a) Briefly comment what each line of the following code does.

(i) `int x = 2;`

(ii) `int *p;`

(iii) `p = &x;`

(iv) `*p = 4;`

(v) `cout << p;`

(10 marks)

(b) For each of the following library, give a brief description of the library and its function. Then give an example of a function in the library and what it does.

(i) `<string>`

(ii) `<iomanip>`

(6 marks)

(c) Each of the following program segments contains an error. Correct the error.

```
int x;
cout << "Enter a number: ";
cin << x;
cout << "Your number is " << x;
```

(4 marks)

(c) Write a full program, starting from #include, that gets the name of a text file from the user. The program then counts the number of words and lines in the file. You may assume the user's file exists and contains only words, no numbers or isolated punctuation marks. You may also assume that all line breaks occur immediately after a word and there are no blank lines.

A sample run is shown as follows for the given input file `input.txt` at right.

```
Enter file name: input.txt
# of words = 15
# lines = 3
```

(20 marks)