



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2012/2013**

COURSE NAME : COMPUTER PROGRAMMING

COURSE CODE : BEC 10102

PROGRAMME : BEC/BEB/BEH/BED/BEF/BEU

EXAMINATION DATE : JUNE 2013

DURATION : 2 HOURS

INSTRUCTIONS :

- 1. ANSWER ALL QUESTIONS IN SECTION A AND ONE (1) QUESTION IN SECTION B.**
- 2. ANY ANSWER WRITTEN IN PENCIL WILL NOT BE EVALUATED.**
- 3. STUDENT IS NOT ALLOWED TO BRING OUT THE QUESTION PAPER.**

THIS QUESTION PAPER CONSISTS OF NINE (9) PAGES

SECTION A (50 MARKS)

INSTRUCTION: Answer ALL questions. Any answer written in pencil will not be evaluated.

Q1 (a) Answer (i) to (iv) based on the following structure declaration.

```
struct s{
    int t;
    float m;
    char j;
}arr[100];
```

Give your answer for the following statement in terms of true or false. If your answer is false, provide a reason.

- (i) The given C++ statement defines the *s* structure has three (3) members.
- (ii) A dot (.) operator is use to access value holds by member of the structure.
- (iii) A user-defined function named *functionName* receives the value of fifth element of *t* and *m* from a caller function. The *functionName* returns *char* type data to the caller function to be stored in the fifth element of *j* of the *s* structure.

Therefore, a C++ statement of function call for the description is as follows.

```
arr[4].j = functionName (arr[4].t, arr[4].m);
```

- (iv) C++ statement of function prototype for the description in Q1(a)(iii) is as follows.

```
char functionName (int arr[4].t, float arr[4].m);
```

(5 marks)

- (b) Given a structure definition as follows.

```
struct student{
    char name[30];
    int totalscore;
    char grade;
} nStud [N];
```

Construct C++ fragment code based on the following description.

- (i) Store all inputs that was keyed in by a user to its structure's member.

(5 marks)

- (ii) Determine a grade for each student as follows.

totalscore	Grade
$80 < \text{totalscore} \leq 100$	A
$60 < \text{totalscore} \leq 80$	B
$0 < \text{totalscore} \leq 60$	C

then store it in its structure member named *grade*.

(8 marks)

- (iii) Display all information stored in the structure.

(7 marks)

Q2 (a) Determine whether True or False for statements in (i) to (v).

- (i) A variable name indirectly references a value, whereas a pointer directly references a value.
- (ii) The * operator is referred as dereferencing operator.
- (iii) A pointer can be initialised using 0, NULL or an address.
- (iv) The && operator returns the memory address of its operand.
- (v) `void Display (int *sum)` shows the `Display` function is called using pass-by-reference mechanism.

(5 marks)

(b) Given a complete program named *Program Q2b* to answer (i) and (ii). (Note that line numbers have been added to you identify certain parts of the program.)

```

1.  /*Program Q2b*/
2.  #include <iostream>
3.  using namespace std;
4.
5.  void main()
6.  {
7.      int firstvalue, secondvalue;
8.      int *mypointer;
9.
10.     mypointer = &firstvalue;
11.     *mypointer = 10;
12.     mypointer = &secondvalue;
13.     *mypointer = 20;
14.
15.     cout << "firstvalue is " << firstvalue << endl;
16.     cout << "secondvalue is " << secondvalue << endl;
17. }
```

- (i) Assume memory location 1773, 1778, and 1990 are assigned to variable *firstvalue*, *secondvalue* and *mypointer* respectively. Draw a memory snapshot of the instruction at line 7 to 8 and line 10 to 13.
- (ii) Determine the output of the program.

(10 marks)

(c) Construct C++ statement(s) that has the same meaning as the following statement in (i) to (iv). (*Note: Each question is related to each other.*)

- (i) Declare two integer variables named *res* and *cur*. Initialize the value of *res* with 5.
- (ii) Declare an integer pointer type identifier named *g*.
- (iii) Assign the *g* to the address of *res*.
- (iv) Call a user-defined function named *desc* and transfer two (2) parameters; the *g* and the address of *cur*.

(10 marks)

SECTION B (10 MARKS)

INSTRUCTION: Answer ONE question only. Any answer written in pencil will not be evaluated.

Q3 Analyse the following program of *Program Q3*. (Note that line numbers have been added to you identify certain parts of the program.)

```

1.  /*Program Q3*/
2.  #include <iostream>
3.  using namespace std;
4.
5.  void main(){
6.      float x=0.0,
           y=0.0,
           z=0.0;
7.      //Read two float numbers
8.      cout<< "Enter first number >> ";
9.      cin>>x;
10.     cout<< "Enter second number >> ";
11.     cin>>y;
12.
13.     /*Determine whether y is 0 or not. If no, find and
14.     display the division result using (x/y). If yes,
15.     display an error message.*/
16.     If(y!=0);
17.     z=x/y
18.     cout<< "The quotient of "<< x << " over " << y
           << " is " << z;
19.     cout<< "\n";
20.     cout<< "Cannot execute the division operation."<<endl;
21. }

```

- (a) The given *Program Q3* cannot be executed because it has syntax errors. Without changing the given code, point out any syntax error(s) by stating the line number and describe a reason(s) of error occurs at the pointed line.

(5 marks)

- (b) Now, assume all the syntax errors in the *Program Q3* have been identified and corrected. Let's say a user enters 2 and 0 for x and y respectively. Based on the description in line 12 of the program, supposedly the expected output of the program is shown in Figure 1.

```

Enter first number >> 2
Enter second number >> 0
Cannot execute the division operation.
Press any key to continue

```

Figure 1: Expected output of Program Q3

However, instead of producing the above output, the corrected program produced the output as in Figure 2.

```

Enter first number >> 2
Enter second number >> 0
The quotient of 2 over 0 is 1.#INF
Cannot execute the division operation.
Press any key to continue

```

Figure 2: Output of Corrected Program Q3

- (i) If all the syntax errors in the given program have been corrected, why the output differs from expectation?
- (ii) Recommend one solution for *Program Q3* so that the program is able to display the output as shown in Figure 1 and suitable with the description at line 12. The recommendation should clearly state the line number that should be corrected along with correct C++ statement for that particular line.

(5 marks)

Q4

Analyse the program of *Program Q4*. (Note that line numbers have been added to you identify certain parts of the program.)

```
1.  /*Program Q4*/
2.  #include <iostream>
3.  using namespace std;
4.
5.  int fun (int x, int* y);
6.
7.  void main () {
8.      int a, b, c;
9.      a = 9;
10.     c = fun(a, &b);
11.     cout << "a=" << a
12.         << " b=" << b
13.         << " c=" << c << ".\n";
14. }
15.
16. int fun (int x, int* y) {
17.     *y = x/2;
18.     x = 13;
19.     cout << "x=" << x << " y=" << *y << ".\n";
20.     return (*y - x);
21. }
```

- (a) Investigate the output of the program. Use block diagram to show how the output is obtained.

(5 marks)

(b) Given the following segment code.

```
1. int i;  
2. cout << "i = ";  
3. for (i=0; i<=20; i+=5) ;  
4.     cout <<i << " ";  
5. cout << endl<<"y = "<<i<<endl;
```

Decide whether the given code is able to produce the following output or not.

<pre>i = 0 5 10 15 20 y = 25</pre>
--

Figure 3: Output

If yes, prove it using a tracing table. If no, explain a reason then recommend a solution. The recommendation should clearly state the line number that should be corrected along with correct C++ statement for that particular line.

(5 marks)

- END OF QUESTION -