



**UTHM**

Universiti Tun Hussein Onn Malaysia

**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAM  
SEMESTER I  
SESSION 2019/2020**

COURSE NAME : OBJECT-ORIENTED  
PROGRAMMING  
COURSE CODE : BIC 20904  
PROGRAMME CODE : BIS / BIP / BIW / BIM  
EXAMINATION DATE : DECEMBER 2019/ JANUARY 2020  
DURATION : 3 HOURS  
INSTRUCTION : A) ANSWER ALL QUESTIONS  
B) PLEASE WRITE YOUR  
ANSWERS IN THIS QUESTION  
BOOKLET

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THIS QUESTION PAPER CONSISTS OF TEN (10) PAGES

Q1 Answer questions Q1(a)-Q1(b) based on the program given in Figure Q1.

```
//Filename: finalQ1a.cpp

class finalQ1a{

    private:
        int p, q;

    public:
        int r;
        void m1(int a, int b);
        int m2();

    private:
        int makeP();
};

void finalQ1a::m1(int a, int b)
{
    p = b;
    q = a;
};

int finalQ1a::m2()
{
    return 100+100*p+q;
};

int finalQ1a::m2()
{
    return -100*p;
};

//Filename: finalQ1b.cpp

#include <iostream.h>
#include "finalQ1a.cpp"

class finalQ1b{

    private:
        finalQ1a test;
        int m6();

    public:
        void m3();
        int m4();
        int m5(); };

void finalQ1b::m3()
{
    int n1, n2;

    cout <<"\n Enter first value:";
    cin >> n1;
    cout <<"\n Enter second value:";
    cin >> n2;
```

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```

    test.m1(n1,n2);
};

int finalQ1b::m4()
{
    return test.m2();
};

int finalQ1b::m5()
{
    return test.m2();
};

int finalQ1b::m6()
{
    return 10;};

//Filename: finalQ1c.cpp

#include <iostream.h>
#include "finalQ1b.cpp"

int main()
{
    finalQ1b MyM1, MyM2[5], *MyP1;
    finalQ1a MyM3, MyM4[3], *MyP2;
}

```

**Figure Q1**

- (a) Determine whether each of the following statements is **TRUE** or **FALSE** based on the information presented in **Figure Q1**. (10 marks)

Statements	Answer
MyM1 and MyM2 are methods of the main program.	
MyM1 is an example of a class with a single attribute.	
MyM3 is an instance of finalQ1a with a single attribute.	
test is an instance of finalQ1b.	
All of the methods in finalQ1a can be invoked from finalQ1b and main().	
All of the methods in finalQ1b can be invoked from finalQ1a and main().	
MyM1 is an instance with a single attribute.	
MyM3 is an instance with three attributes.	

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All private properties must be declared before public properties in a class.	
MyM4 contains three instances of finalQ1a.	

- (b) Determine whether each of the following programming statements is **VALID** or **INVALID** if it is implemented in the main program given in **Figure Q1**.

(20 marks)

Programming statements	Answer
MyP2->r = 280; cout<<MyP2->r;	
MyM4[0].m1(-10,25*2);	
cout<<MyM1.m2();	
cout<<MyP2->makeP();	
MyP1->m3();	
MyM2[3].m3();	
int num = MyP1->m4()+MyP1->m5();	
cout<<MyM2[5].m4();	
test.r = 1000;	
MyM4[1].p = 5000;	

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**Q2** Answer **Q2(a)**-**Q2(b)** based on the program given in **Figure Q2**.

```
//Filename: finalQ2a.cpp
class finalQ2a{
    private:
        double num1, num2;
        char alpha1, alpha2;
        int value1, value2; };

//Filename: finalQ2aMain.cpp
#include "finalQ2a.cpp"
int main()
{
    finalQ2a V1(10.5,20.8);
    finalQ2a V2('A','Z');
    finalQ2a V3(100,200);
    finalQ2a V4('X',250,3.14);

    return 0;
}
```

**Figure Q2**

- (a) Declare all of the constructors for `finalQ2a` based on the information in **Figure Q2**.

(10 marks)

**Answer:**

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- (b) Implement all of the constructors for `finalQ2a`.

(20 marks)

**Answer:**

- Q3** Figure Q3 presents a program with linked list application. Answer Q3(a)-Q3(c) based on the information given in Figure Q3.

```
//Filename:Book.cpp
#include <iostream.h>

class Book{
private:
    struct BookData{
        char title[20];
        int quantity;
        double price;
    }bookInfo;

public:
    void setBookData();
    void getBookData();
};

void Book::setBookData()
{
    cin>>bookInfo.title;
    cin>>bookInfo.quantity;
    cin>>bookInfo.price;
};
```

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```
void Book::getBookData()
{
    cout<<bookInfo.title<<"\n";
    cout<<bookInfo.quantity<<"\n";
    cout<<bookInfo.price<<"\n";
};

#include <iostream.h>
#include "Book.cpp"

class BookList{

    private:
        struct BookNode{
            Book myBook;
            BookNode *next;
        }bookInfo;

        BookNode* head;

    public:
        BookList();
        int IsEmpty();
        void Insert(Book newBook);
        void Delete();
        void ShowBookList();
};

BookList::BookList(){
    head = NULL;};

int BookList::IsEmpty()
{ if(head == NULL)
    return 0;
  else
    return 1;};

void BookList::ShowBookList(){
    BookNode *cur = head;

    if (IsEmpty() == 0)
        cout << "\nNo books in the list.";
    else
    {
        while(cur!=NULL){
            cur->myBook.getBookData();
            cur = cur ->next;
        }
        cout<<"\n";
    }
};
```

Figure Q3

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- (a) The `BookList` has missing method, namely `Insert`. Write the `Insert` method to add new book information at the end of the linked list.

(15 marks)

**Answer:**

- (b) The `BookList` has missing method, namely `Delete`. Write the `Delete` method to remove existing book information from the beginning of linked list.

(10 marks)

**Answer:**

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(c) Determine the output for each of the following code.

(5 marks)

Code	Output
<pre>//Filename:Q3a.cpp #include &lt;iostream.h&gt;  class First{     protected:         int a;     public:         First(int x = 1)             { a = x;};          int getVal()             { return a;} };  class Second:public First {     private:         int b;      public:         Second(int y = 5)             { b = y;};          int getVal()             { return b;}; };  int main() {     First sample1;     Second sample2;     cout &lt;&lt; sample1.getVal()&lt;&lt;endl;     cout &lt;&lt; sample2.getVal()&lt;&lt;endl;     return 0; }</pre>	

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```
//Filename:Q3b.cpp
#include <iostream.h>
class First{
    protected:
        int a;
    public:
        First(int x = 1)
            { a = x;};

        void twist()
            { a*=2;};

        int getVal()
            { twist(); return a;}
};

class Second:public First
{
    private:
        int b;

    public:
        Second(int y = 5)
            { b = y;};
        void twist()
            { b *= 10;};
};

int main()
{
    First sample1;
    Second sample2;

    cout << sample1.getVal()<<endl;
    cout << sample2.getVal()<<endl;
    return 0;
}
```

- END OF QUESTIONS -

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