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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

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

COURSE NAME : OBJECT-ORIENTED PROGRAMMING
COURSE CODE : BIT 20603
PROGRAMME CODE : BIT
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 **TWELVE (12)** PAGES

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Q1 (a) Give the definition of the following object-oriented concept;

(i) Encapsulation

(2 marks)

Answer:

(ii) Inheritance

(2 marks)

Answer:

(iii) Polymorphism

(2 marks)

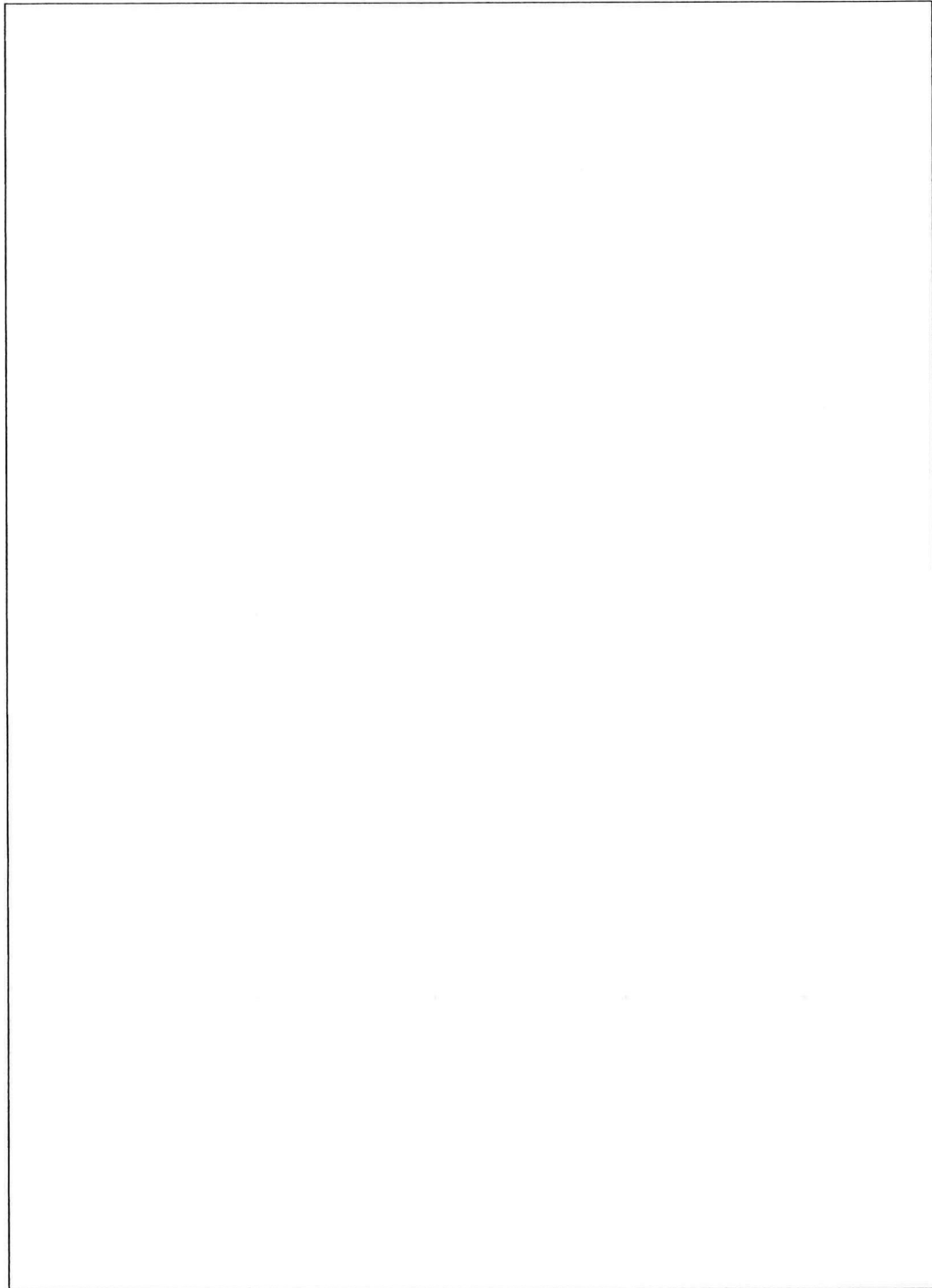
Answer:

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- (b) By giving appropriate examples, explain **TWO (2)** categories of Inheritance.

(12 marks)

Answer:

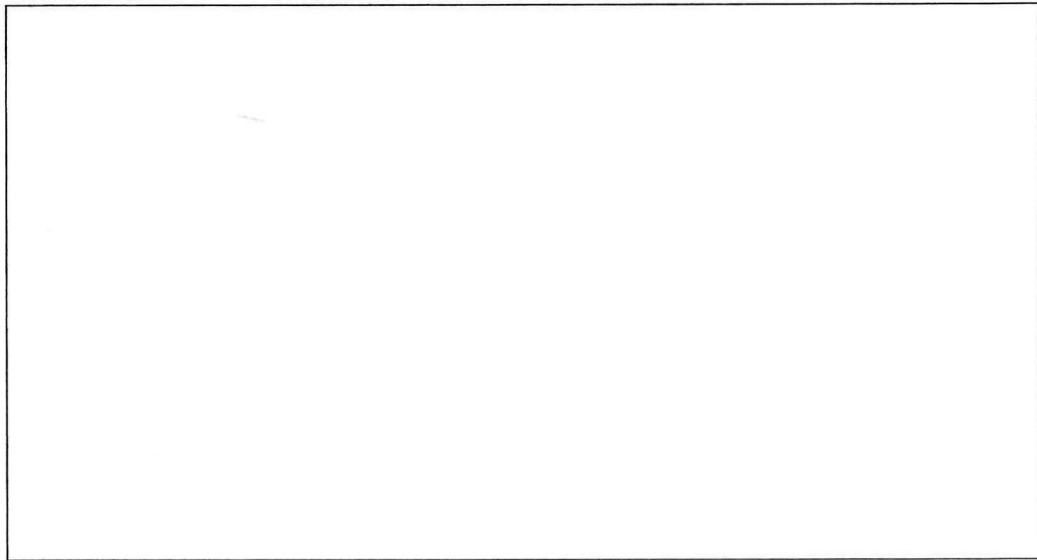


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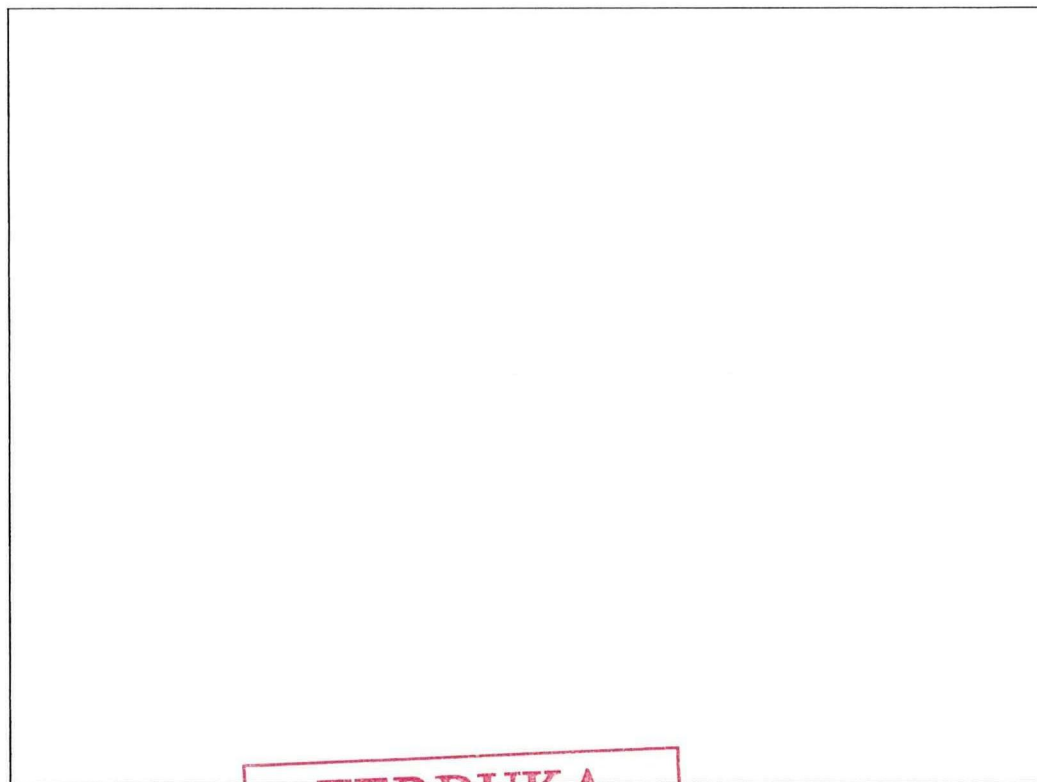
- (c) Explain **THREE (3)** differences between constructor and destructor. (6 marks)

Answer:



- (d) Discuss **THREE (3)** advantages of object-oriented approach. (6 marks)

Answer:



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Q2 Answer Q2(a) – Q2(c) based on Figure Q2.

```
class Count{
    private:
        int num[10];

    public:
        void setInput();
        void displayOutput();
};
```

FIGURE Q2

- (a) Implement method `setInput()` outside class `Count`. Apply appropriate control structure to allow user to enter 10 integer values into array `num`.
(12 marks)

Answer:

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- (b) Implement method `displayOutput()` outside class `Count`. Apply appropriate control structure to determine maximum value from the array and display the maximum value.

(15 marks)

Answer:

- (c) Write a driver file (`main`) to instantiate objects from `Count`. Invoke the required methods to receive input and display the maximum integer value stored from the array.

(3 marks)

Answer:

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Q3 Answer **Q3(a)** based on Figure **Q3(a)** , **Q3(b)** and **Q3(c)**.

```
//Filename: Sum.cpp
#include <iostream>
using namespace std;

class Sum{
    public:
        int sum2no(int no1, int no2);
        void displayDetails(int x, int y);
};

int Sum::sum2no(int no1, int no2){
    return no1+no2;
}

void Sum::displayDetails(int x, int y){
    cout<<"The sum of "<<x<<"and the sum of "<<y;
    cout<<"are "<<sum2no(x,y)<<endl;
}
```

FIGURE Q3(a)

```
//Filename: Student.cpp
#include <iostream>
using namespace std;

class Student{
    private: char name[25];
    public : void setName();
            void getName();
};

void Student::setName(){
    cout<<"enter name ";
    cin>>name;
}

void Student::getName(){
    cout<<"Name: "<<name<<endl;
}
```

FIGURE Q3(b)

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```
//Filename: Test.cpp
#include <iostream>
#include "Sum.cpp"
#include "Student.cpp"
using namespace std;

class Test: public Student, public Sum{
private: int result;
public : Test();
        void setResult();
        void getResult();
};

Test::Test(){
    result=0;
}

void Test::setResult(){
    int mark1, mark2;
    cout<<"Enter first mark: ";
    cin>>mark1;
    cout<<"Enter second mark: ";
    cin>>mark2;
    result=sum2no(mark1, mark2);
}

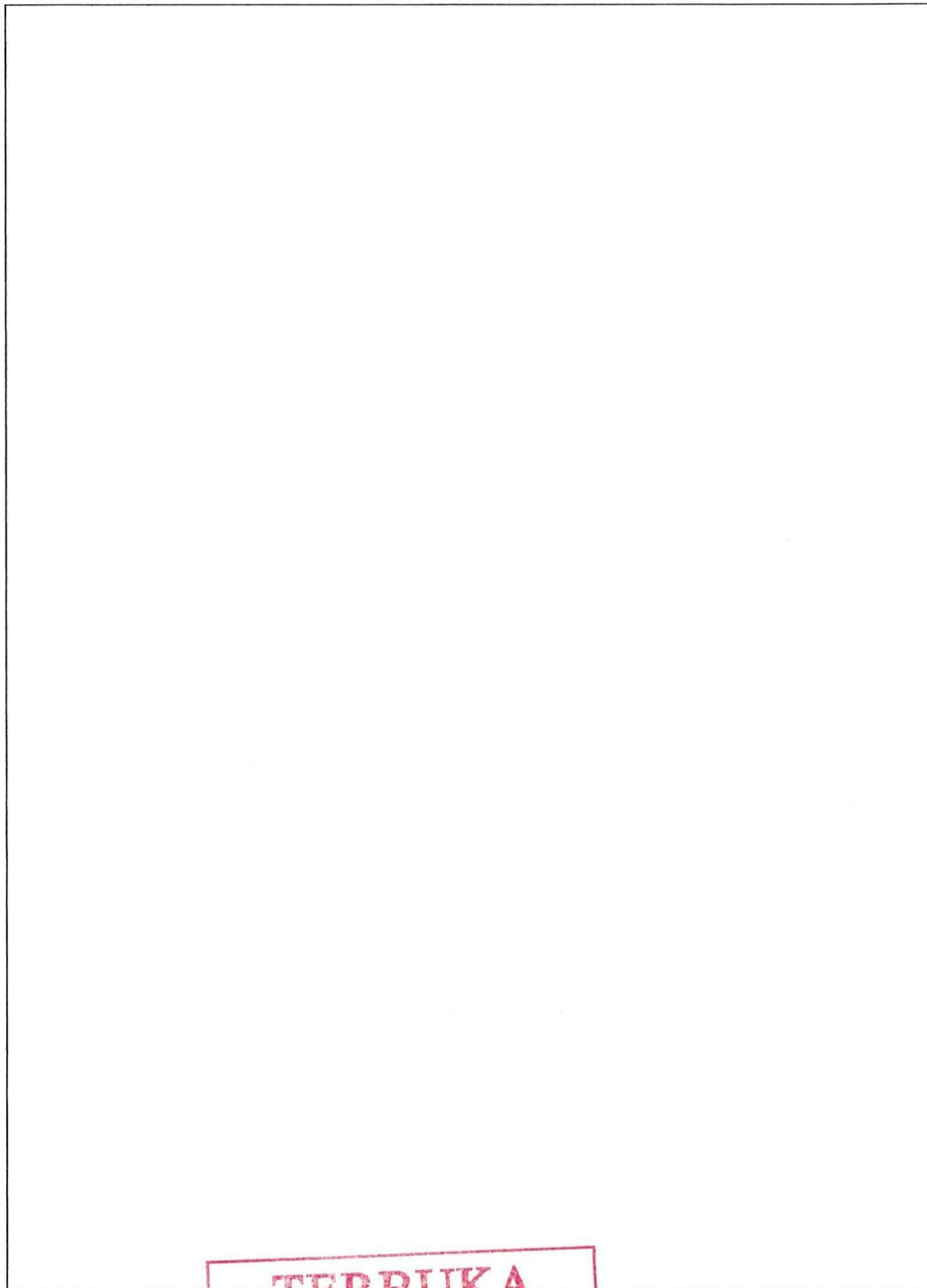
void Test::getResult(){
    cout<<"Result: "<<result<<endl;
}
```

FIGURE Q3(c)**TERBUKA**

- (a) Draw a complete UML diagram and show the relationship between classes.

(14 marks)

Answer:



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- (b) Identify all methods that can be invoked by an object instantiated from class Test.

(6 marks)

Answer:

Q4 Answer Q4(a) – Q4(b) based on Figure Q4(a).

```
class CustomerList {
private:
    struct ListNode {
        Customer acustomer;
        ListNode *next;
    };
    ListNode *head;
public:
    CustomerList();
    int IsEmpty();
    void Add(Customer newCustomer);
    void Remove();
    void DisplayList();
};

int CustomerList::IsEmpty() {
    if (head == NULL) return 0;
    else return 1;
} // method IsEmpty
```

FIGURE Q4(a)

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- (a) Implement the constructor for the class. In the constructor assign pointer head with null.

(5 marks)

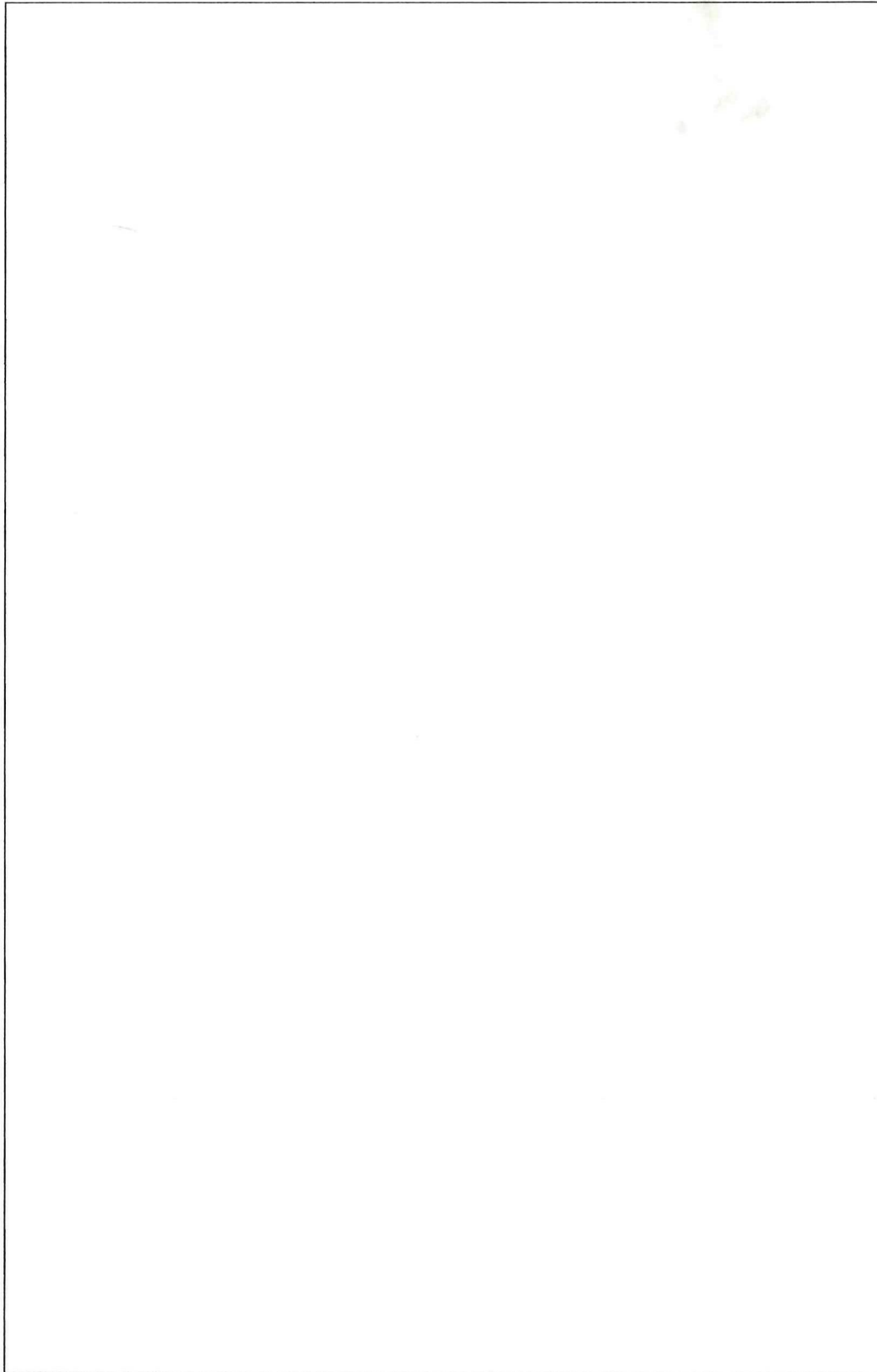
Answer:

- (b) Implement method `Add(Customer newCustomer)` to add new instance at the end of the linked list for the class in **Figure Q4(a)**.

(15 marks)

Answer:

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- END OF QUESTIONS -

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