CONFIDENTIAL

SCHOOL OF COMPUTING
Faculty of Engineering

UNIVERSITI TEKNOLOGI MALAYSIA

FINAL EXAMINATION (WRITTEN)

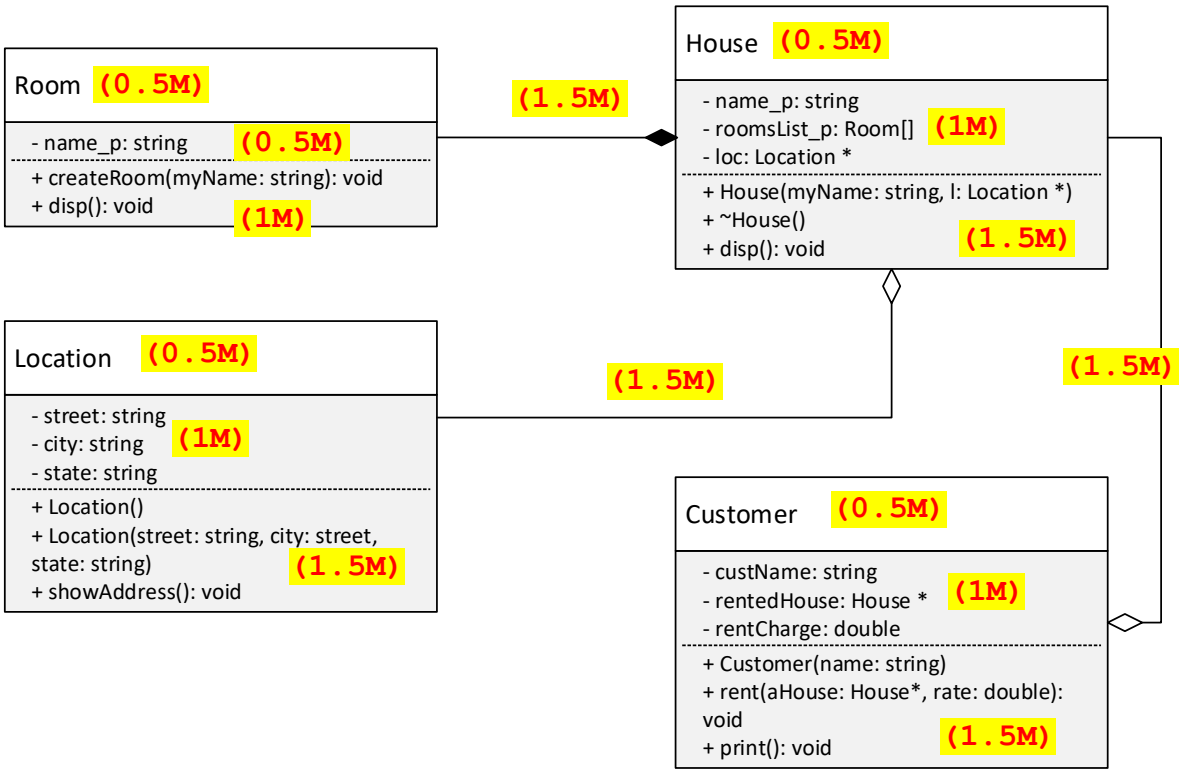
SEMESTER II 2018/2019

SUBJECT CODE : **SCSJ1023**
SUBJECT NAME : **PROGRAMMING TECHNIQUE II**

SOLUTIONS

Question 1 **[29 marks]**

a) Draw the UML class diagram that shows the relationship between classes. [16.5 marks]



Note: *Relationship (1.5 marks) – use correct relationship/ symbol (composition) = 1M, show correct direction = 0.5M*

b) [12.5 marks]

Table 1: Expected Output of Program 1

Lines	Expected Output
111	Name of the House: Jungwoo Villa (1M) Address 121, Orchid Garden Johor Bahru Johor (1M) Rooms details... (0.5M) Kitchen (1M) BedRoom (1M) Drawing Room (1M)
114	Hafizi rents Jungwoo Villa (1M) Rent Charges : 2500 (1M)
115	Deleting House... (1M) Delete all the Rooms... (1M) Kitchen is deleted. (1M) BedRoom is deleted. (1M) Drawing Room is deleted. (1M)

Question 2 **[21 marks]**

a) [12 marks]

(i)

```
Mammal(string name, double weight, string hairColor)
{
        _name = name; (1M)
        _weight = weight; (1M)
        _hairColor = hairColor; (1M)
}
```

(ii) **~Mammal() (1M)**

(iii) **~WingedAnimal() (1M)**

(iv) **class Bat: public Mammal, public WingedAnimal (6M)**
(2M) (2M) (2M)

(v) **~Bat() (1M)**

b) [9 marks]

Mammals are vertebrates in the Mammalia class. (1M)
This black cow weights 500 pounds. (1M)
Mammals can give direct birth. (1M)
Winged animal can flap. (1M)
Bat is a mammal. (1M)
Bat is destroyed. (1M)
Winged animal is destroyed. (1M)
Mammal is destroyed. (1M)
Mammal is destroyed. (1M)

Question 3 **[21 marks]**

a) [3 marks]

Line 52-53 (1M) : Error because of the base class default constructor is undefined ⇨ If you do not explicitly initialize a base class constructors by calling a constructor, the compiler automatically initializes the base class with a default constructor **(2M).**

b) [4 marks]

```
HybridCar(int p = 50000, int b = 1, int d = 2000, string s="")
: NormalCar(d, s), ElectricCar(b, s)
```
(2M) (2M)

c) [5 marks]

Car (1M)
Normal car (1M)

```
Car (1M)
Electric car (1M)
Price: RM65000 (1M)
```

d) [9 marks]

Table 2: Modification of Program 3

Lines	Modified Program	Action (Add/ Delete/ Update)
30 (1M)	`Car::show();` (2M)	Add (0.5M)
58 (1M)	`NormalCar::show();` (2M) `ElectricCar::show();` (2M)	Add (0.5M)

Question 4 **[29 marks]**

a) [19 marks]

i) (6 marks)
```
class DivisionByZero{}; //2M
class InvalidSequence{}; //2M
class NegativeValue{}; //2M
```

ii) (2 marks)
```
throw DivisionByZero(); //2M
```

iii) (2 marks)
```
throw InvalidSequence(); //2M
```

iv) (3 marks)
```
throw Operation::NegativeValue(); //3M
```

v) (2 marks)
```
(Operation::NegativeValue) //2M
```

vi) (2 marks)
```
(Operation::DivisionByZero) //2M
```

vii) (2 marks)
```
(Operation::InvalidSequence) //2M
```

b) [10 marks]

i) (1 mark)
```
Error! Division by zero.
```

ii) (2 marks)
```
Division = 0
Error! Invalid sequence.
```

iii) (2 marks)
```
Division = 0
Error! Invalid sequence.
```

iv) (1 mark)
```
Error! You have entered a negative value.
```

v) (3 marks)
```
Division = 4
In descending order = 6 4 2 0 //2M
```

vi) (1 mark)
```
Error! You have entered a negative value.
```