Faculty of
Computing

UNIVERSITI PENYELIDIKAN

UNIVERSITI TEKNOLOGI MALAYSIA
SEMESTER I, 2017 / 2018

PROGRAMMING TECHNIQUE II (SCSJ1023)

PAPER II (THEORY)

SOLUTION

Question 1   **[25 Marks]**

a.   (4 marks)

Answer:

Composition is a type of an aggregation (i.e., a "has-a" relationship), but it is more strict whereby the objects of the participating classes are dependent to each other. One object (contained object) becomes part of the other object (the container). Deleting the container will also delete the containee object (2m)

Example: Body and heart (2m). Body needs heart to live, and heart must have a body to function. (2m)

b.   (4 marks)

In aggregation, the existence of the participating objects are independent (2m). For example, destroying an object will not be destroying the other object. Only the link/pointing to the object is disconnected (2m).

c.   (17 marks)

Answer:

```
class Classroom{
    public:
            Subject subject;   // i. (2m)

            Classroom(){}
};

class Teacher{
    private:
            string name;

            Contact contact; // ii. (2m)
            Department *department; // 2.5m
            Classroom *classroom; // 2.5m

    public:
            Teacher(string n=""){name=n;}

            void print() const{
                    string dept = department->getName(); //iii.  2.5m
                    string phone= contact.getPhone();  //iv.  (2.5m)
                    string subj = classroom->subject.getName(); //v. 3m

                    cout << "Teacher's name : " << name  << endl;
                    cout << "Department    : " << dept  << endl;
                    cout << "Phone number  : " << phone << endl;
                    cout << "Subject taught : " << subj  << endl;
            }
```
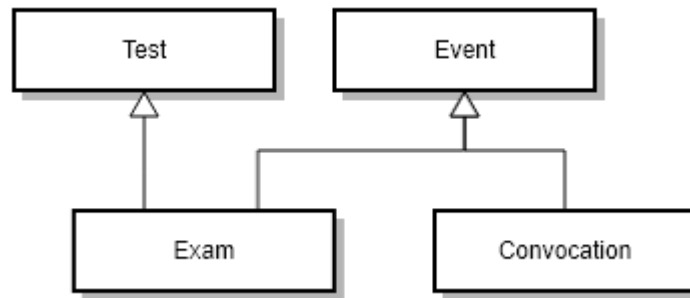
```
    };
```

Question 2 [35 marks]

a. (14 marks)

Answer: (12 marks) class 2m each (x 4), relationship 2m each (x 3)

b. (12 marks)

C++ statement	Output (Answer) *(12 marks) 2m each line with correct order*
Test t;	Test
Convocation c;	Event Convo
Exam xm;	Test Event Exam

c. 9 marks. *1.5m each.*

	venue	year	Score
xm owns	Y	N	Y
xm can access	Y	N	N

Question 3 [22 marks]

(22 marks). 1.5m each line unless stated.

	C++ code	Output (Answer)
a)	```cout <<"English: " << f1.englishName() << endl; cout <<"Malay: " << f1.malayName() << endl;```	English: Fruit Malay : Buah-buahan
b)	```cout <<"English: " << f2.englishName() << endl; cout <<"Malay: " << f2.malayName() << endl;```	English: Banana Malay : Buah-buahan
c)	```cout <<"English: " << b.englishName() << endl; cout <<"Malay: " << b.malayName() << endl;```	English: Banana Malay : Pisang
d)	```f2->showBenefit();```	Banana Good for diet
e)	```b->showBenefit();```	Banana Good for diet Pisang High vitamins
f)	```delete f2;```	Remove Banana //2 m Remove Fruit // 2m

Question 4 [18 marks]

(18 marks). 1.5m each line

No	User Input (n1, n2, choice)	Answer (Screen Output)
a)	**D 8 2**	Division: 4 Numbers are 8 and 2
b)	**X 3 1**	Invalid Operation
c)	**D 5 0**	Unknown Error
d)	**S 1 9**	Number: 1 Number: 3 Number: 5 Number: 7 Numerical Error: 9
e)	**S 7 5**	Invalid Sequence
f)	**D 4 -2**	Numerical Error: -2
g)	**S -3 1**	Numerical Error: -3