ENSF 614 QUIZ 3 – FALL 2021
SOLUTIONS

SOLUTION for QUESTION 1:

```
// 2 marks for correct and perfect solution - 1 mark deducted per error
Broadcaster::Broadcaster(string news): new_news(news){ }


/ 2 marks for correct and perfect solution - 1 mark deducted per error
void Broadcaster::add(Viewer& v) {
    viewers.push_back(&v);
}


/ 2 marks for correct and perfect solution - 1 mark deducted per error
void Broadcaster::remove (Viewer& v){
    for(int i=0; i < viewers.size(); i++){
        if(viewers.at(i) == &v){
            viewers.at(i) = nullptr;
            break;
        }
    }
}


/ 4 marks for correct and perfect solution - 1 mark deducted per error
void Broadcaster::notifyAllCustomers(){
    for(int i = 0; i < viewers.size(); i++){
        if(viewers.at(i) != nullptr)
            viewers[i]->update(new_news);
    }
}
```

SOLUTION for QUESTION 2:

```
class Matrix {
public:
    static Matrix* get_only_instance(int row, int column);        // 1 mark
    int& at(const int& row, const int& column);
    void display();

private:
    Matrix(int row, int column);              // 1 mark if under private
    static Matrix* only_instance;             // 1 mark if under private
    Matrix& operator= (const Matrix& rhs);    // 1 mark if under private
    Matrix(const Matrix& src);                // 1 mark if under private
    matrix storageM;

};



// 1 mark, OK if not initialized by nullptr.
Matrix* Matrix::only_instance = nullptr;

Matrix* Matrix::get_only_instance(int row, int column){// 1  mark for correct heading
    if(only_instance == nullptr){                       // 1  mark for correct if
        only_instance = new Matrix(row, column);       // 1 mark for memory allocation
    }
    return only_instance;                               // 1 marks for correct return

}
```