Air University
Mid Semester Examinations: Spring 2025

Student ID: _____

Subject: OOP Lab
Class: BYCYS - F24ev
Section(s): A, B
Course Code: CS112L

Time Allowed: 60 Minutes
Max Marks: 50
FM's Name: Iram Fatima Hashmi
FM's Signature:

INSTRUCTIONS

- All questions must be attempted.
- This examination carries 15% weight towards the final grade.
- Submit code in word file in text form (no screenshots). And submit output screenshot of entire screen as shared in lab in same file.

Q. No. 1 (CLO 1)	**A car rental company needs a system to manage vehicle records. Design a Car class based on the following requirements:** **a)** Implement a Car class having following data members: modelName, registrationNumber, engineCapacity (as a pointer), rentPerDay, and totalCars. **b)** Create a constructor with initializer list to the class Car to initialize the data members of object. Also, create a copy constructor to create copy of objects. **c)** Create getter and setter functions. Also, create a member function calculateRent() that calculates the rent for certain number of days. **d)** Use your understanding of static and constant keyword to make the members constant and static. **e)** In main function perform the following: i. Create a dynamic array of 5 objects and assign them values. ii. Create a pointer type object and point it to first object of array created in part i. Traverse the pointer through array and call getter function to display data for each member. iii. Create an object that is copy of 3rd object created in part i. Mention if it's shallow copy or deep copy.	**Marks (30)** 5+5+5+5+10
Q. No. 2 (CLO 1)	**Below is the code for Rectangle class having two data members width and height. Main function is also provided.** class Rectangle { int width;	**Marks (20)** 15+5

```
        int height;
public:
        Rectangle(int width, int height) : width(10), height(10) {
        }
        void setHeight(int height) {

        height = height;
        }
        void setWidth(int width) {

        width = width;
        }
        void getWidth() {

        cout << "Width= " << width << endl;
        }
        void getHeight() const {

        cout << "Height= " << height << endl;
        }
};
int main() {
        Rectangle rect(20, 30);
        rect.setWidth(30);
        rect.setHeight(40);
        rect.getHeight();
        rect.getWidth();
        Rectangle* rect2 = &rect;
        rect2->setWidth(60);
        rect.setWidth(50);
        rect2->getWidth();
```

	rect.getWidth();
	
	}
	
	a) Run the above code and identify the logical issues in the program. Update the code to fix the issue.
	
	b) Create a flow showing how the code was working before fixing the issue and after fixing the issue.	