MCA Semester-II
Subject: Advanced Programming Technique-I [C++]

Practical Laboratory - 2

Topic/Unit: Class, Object, access specifier

Sr.	Write?	Task

1	*	Create a file person.cpp. In that file, create a class `Person` with following characteristics (data members) :
		`char name[10]`
		`char surname[10]`
		`int age`
		`char gender`
		Add following behaviour/method (member functions) to the `Person` class.
		`void setName(char nm[]);`
		`void setSurname(char snm[]);`
		`void setName(char nm[]);`
		`void setAge(int ag);`
		`void setGender(char gen);`
		`void show();`
		
		In `main()` function, create two objects '`ram`' and '`rahim`'. Demonstrate usage of member functions on the two objects `ram` and `rahim`. Also understand the meaning of 'message passing'.

2	*	- Add a method (behaviour) to the `Person` class:
		`void setPerson(char nm[], char snm[], int ag, char gen);`
		Let the `setPerson()` method utilize the services of previously defined methods- `setName(), setSurname(), setAge() and setGender().`
		- Add a method to the Person class:
		`void printFullName();`

3	*	Create a class `Student` with data members: `rollno, name, semester, c_marks, cpp_marks, java_marks, total_marks, percentage` and `grade`.
		Add following behaviours to the `Student` class:
		`void setStudent(int rno, char nm[], int sem, float cm, float cppm, float jm);`
		`void calculateTotalMarks();`
		`void calculatePercentage();`
		`void calculateGrade();`
		`void showStudent();`
		
		Test following scenario for a Student object '`ram`':
		`Student ram;`
		`hardil.setStudent(22,"ram",2,45,46,45);`
		`hardil.calculateTotalMarks();`
		`hardil.calculatePercentage();`
		`hardil.calculateGrade();`
		`hardil.showStudent();`
		
		Test the above scenario for one more Student object '`mira`'.

4	*	Create a class `Employee` with data members: `empno`, `empname`, `gender`, `basic_salary`, `da`, `hra`, `monthly_salary`, `bonus` and `yearly_salary`. (Assume suitable datatypes for the data members)
		Add following behaviours to the `Student` class:
		`void setEmployee(int eno, char enm[], char gen, int bas_sal);`
		`void calcDa();`
		`void calcHra();`
		`void calcMonthlySalary();`
		`void calcBonus();`
		`void calcYearlySalary();`
		`void show();`
		
		Test following scenario for an Employee object '`ram`':
		`Employee krina;`
		`krina.setEmployee(19,"Krina S.",'F',20000);`
		`krina.calcDa();`
		`krina.calcHra();`
		`krina.calcMonthlySalary();`
		`krina.calcBonus();`
		`krina.calcYearlySalary();`
		`krina.show();`
		Test the above scenario for one more object '`sham`'.
		How much memory does the object `sham` occupy? How much memory does the object `ram` occupy? Why?

5	*	Test the above Q.-4 for an array of `Employees`. Guideline scenario given below:
		`const int N = 4;`
		`Employee emp_arr[N];`
		
		`for(int i=0;i<N;i++)`
		`{`
		`....`
		`emp_arr[i].setEmployee(.......);`
		`}`
		
		`for(int i=0;i<N;i++)`
		`{`
		`....`
		`emp_arr[i].calcDa();`
		`emp_arr[i].calcHra();`
		`emp_arr[i].calcMonthlySalary();`
		`emp_arr[i].calcBonus();`
		`emp_arr[i].calcYearlySalary();`
		`}`
		
		`cout<<endl<<"-----------------------------------------";`
		`cout<<endl<<"--------------EMPLOYEE-DATABASE-------------";`
		`for(int i=0;i<N;i++)`
		`{`
		`....`
		`emp_arr[i].show(); //show formatted output`

		}
6	*	Add a member function to the class `Employee`: `float getMonthlySalary();` <--- The method returns monthly salary. Using the `getMonthlySalary()`, find out the highest-earning and least-earning employees from the `emp_arr` array in the previous Q.-5.

7	*	Create a class `Date` with data members: `int dd, int mm, int yyyy`.
		Provide following member functions to the `Date` class:
		`void setDD(int d);`
		`void setMM(int m);`
		`void setYYYY(int y);`
		`void set(int d, int m, int y);` <-- let it take services of `setDD()`, `setMM()` and `setYYYY()`.
		`int getDD();`
		`int getMM();`
		`int getYYYY();`
		`void printShortDate();`
		`void printLongDate();`
		`int checkLeapYear();` //returns 1 if leap year, 0 otherwise
		`int isValidDate();` //returns 1 if date is valid, 0 otherwise