Part B

5. Answer the following questions using Object Oriented Concepts

    a. Differentiate the terms 'Class' and 'Object'

    b. What is meant by method abstraction?

    c. Explain how does polymorphism can be gained with method
        overloading and method overriding?

    d. Describe what is meant by an inherited class?

6. The Motor Vehicle Branch administers driving tests and issues driver's licenses.
    Any person who wants a driver's license must first take a learner's exam at any
    Motor Vehicle Branch in the province. If he/she fails the exam, he can take the
    exam again any time after a week of the failed exam date, at any branch. If he
    passes the exam, he is issued a license (type = learner's) with a unique license
    number. The person may take his driver's exam at any branch any time before
    the learner's license expiry date (which is usually set at six months after the
    license issue date). If he passes the exam, the branch issues him a driver's
    license.

    Design an E-R diagram by following these steps.

    a. Find out the entities in the spec.
    b. Find out the relationships among the entities.
    c. Figure out attributes of the entities and (if any) of the relationships.
    d. Figure out constraints between entities and relationships.
    e. Check to see if you miss anything in spec.

7. Answer the following questions using SQL knowledge.

    a. What is the difference between DELETE and TRUNCATE commands? Explain with usage and examples.

    b. What is the advantage of having a NOT NULL constraint?

    c. Provide queries using the following schema

        Sailors (sid, sname, rating, age)

        Boats (bid, bname, colour)

        Reserves (sid, bid, day)

    1. Find all sailors who are teens (show all information).

    2. Find the names of sailors who have reserved at least one boat.

    3. Find the colors of boats reserved by 'dustin'.

    4. Find the sailor IDs of all sailors who have reserved red boats but not blue boats.

8. Answer the following questions using Python programming language.

    a. Write a program to meet the following requirements
        Description
            The computer will pick a number between 1 and 100. (You can choose any high number you want.) The purpose of the game is to guess the number the computer picked in as few guesses as possible.
        Input
            The user will enter his or her guess until the correct number is guessed.
        Output
            The program will keep asking the user to guess until he or she gets the number correct. Then the program will print how many guesses were required.

    b. Given an array of integers, return True if 6 appears as either the first or last element in the array. The array will be length 1 or more.