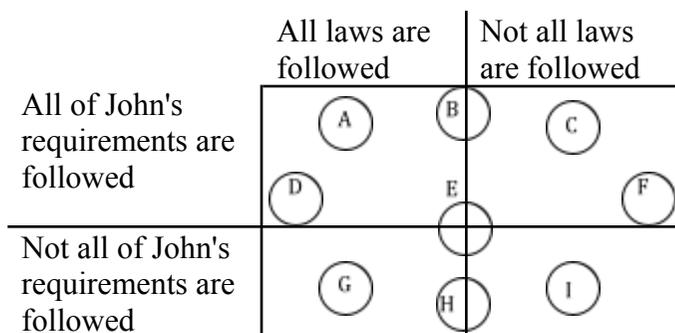1. For each of the modal statements below, is the underlined modal is being used as a deontic modal, an epistemic modal, a teleological modal, or an ability modal? In each case, give a justification for your answer.

    a. I just heard a knock at the door. That <u>might</u> be Bill. As far as I know he's still around.
    b. All passengers on this flight <u>may</u> now unfasten their seatbelts and move around the cabin.
    c. For two numbers x and y, if x is bigger than y, then y <u>cannot</u> be smaller than x.
    d. We haven't had rain for a few days now. The rainy season <u>may</u> be over.
    e. To get good grades, you <u>might</u> try studying.
    f. If you worked out for a month, you <u>could</u> easily lift 40kg.

2. You are at an intersection. The law requires you to either go straight, turn left or turn right. There are no other laws. John insists that you go straight. He has no other requirements. Considering only the law and John's requirements, are the following sentences True, False, or either? In each case, justify your answer.

    a. You can go straight.
    b. You can turn right.
    c. You may make a U-turn.

3. The situation in question 2 can be illustrated with the diagram below, where the largest box represents the set of all possible worlds.

	All laws are followed	Not all laws are followed
All of John's requirements are followed	A B	C
	D E	F
Not all of John's requirements are followed	G H	I

    a. Which circles in the diagram could represent a set of worlds in all of which you go straight?
    b. Which circles in the diagram could represent a set of worlds in all of which you turn right?

4. Suppose there is an additional law that seat belts must be worn.

   a. Which circles in the diagram in question 3 could represent a set of worlds in all of which you go straight?
   b. Which circles in the diagram in question 3 could represent a set of worlds in all of which you turn right?

5. What are the following? Assume that subscripts identify modal flavors as follows: e = epistemic, d = deontic, t = teleological, a = ability.

   Use: E for $\exists$

                 A for $\forall$

                 L for λ

                 /= for $\neq$

                 i for ι

                 w_@ for $w_@$

   a. ||John can$_a$ swim||
   b. ||Mary may$_d$ leave|| (Speaker's permission)
   c. ||Bill might$_e$ win|| (Speaker's knowledge)
   d. ||To arrive first, you could$_t$ run||