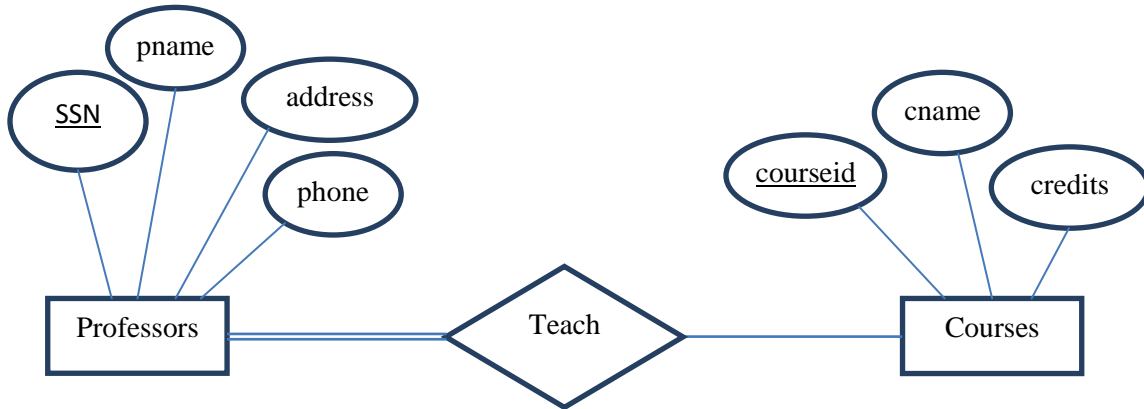


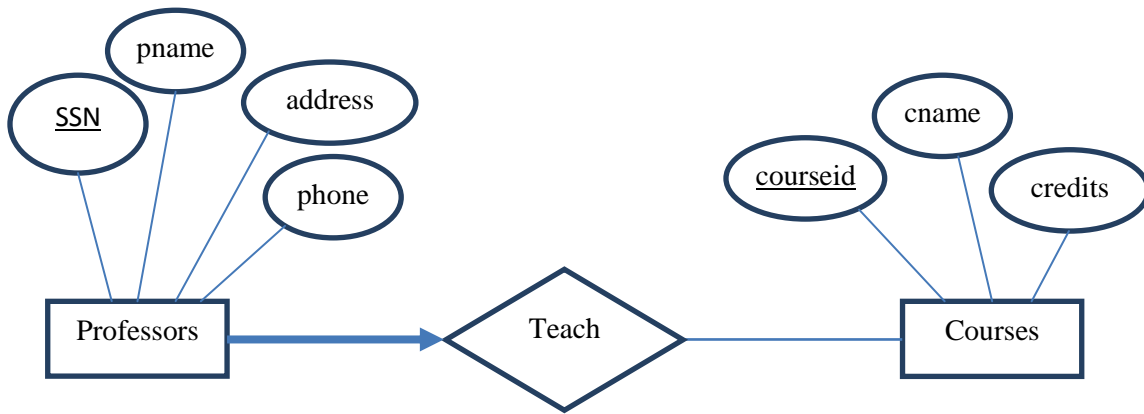
A university database contains information about professors (identified by social security number SSN) and courses (identified by courseid). Professors also have a name, an address and a phone number. Courses have a name and a number of credits. Professors teach courses. For each of the following situations, draw an ER diagram that describes it (assuming no further constraints hold).

- (a) Every professor must teach some course.
- (b) Every professor teaches exactly one course (no more, no less).
- (c) Every professor teaches exactly one course (no more, no less), and every course must be taught by some professor.
- (d) [630 students only] Modify the diagram from (a) such that a professor can have a set of addresses (which are street-city-state triples) and a set of phones. Recall that in the E/R model there can be only primitive data types (no sets).
- (e) [630 students only] Modify the diagram from (d) such that professors can have a set of addresses, and at each address there is a set of phones.

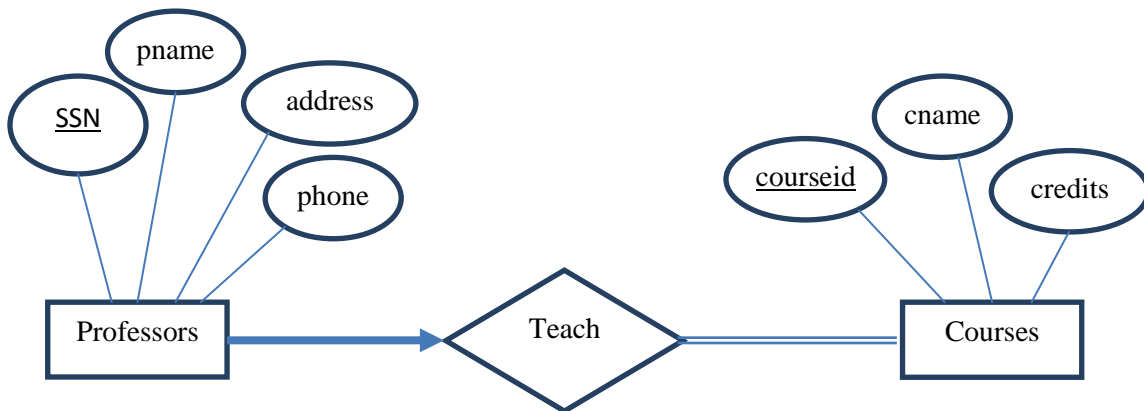
a)



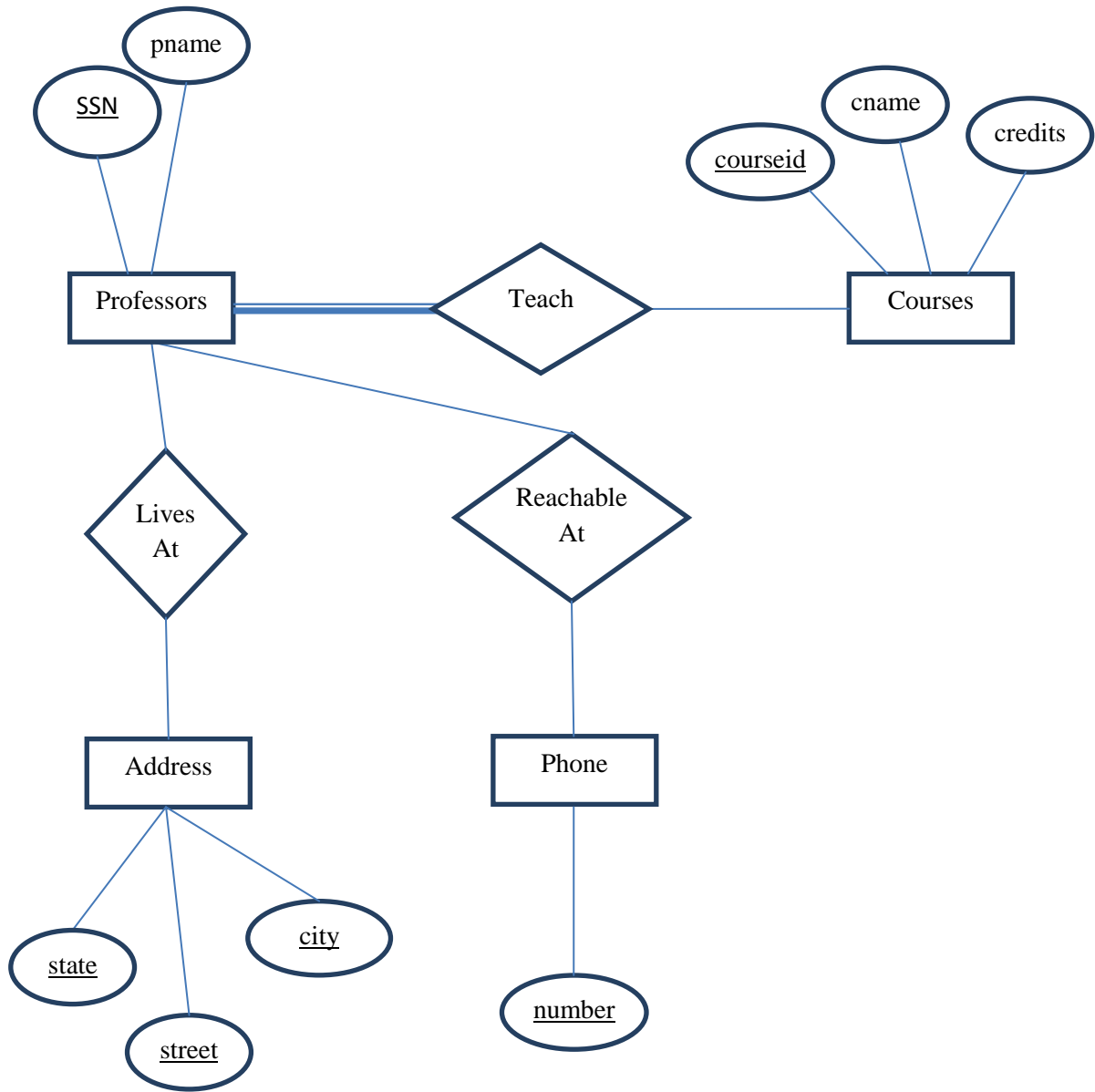
b)



c)



d)



e)

