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Section 2

1.

    a. No, because the sets of parentheses show that some attributes are not functionally dependent on patient_id and will have multiple values for each patient_id potentially.

    Pharmacy(<u>patient_id</u>, patient_name, address, <u>Rx_num</u>, trademark_name, generic_name, <u>filldate</u>, num_refills_left, num_refills)

    b. No, because there are redundancies that can cause update anomalies, insertion anomalies, and deletion anomalies. 2NF was violated because there are non-prime attributes that are not fully dependent on the entire primary key.

    PersonalInfo(<u>patient_id</u>, patient_name, address)
    Prescription(<u>patient_id</u>, <u>Rx_num</u>, trademark_name, generic_name)
    PrescriptionRefills(<u>Rx_name</u>, num_refills)
    RefillsLeft(<u>Rx_num</u>, <u>filldate</u>, num_refills_left)

    c. Yes.

2.

    a. No, because again, the set of parentheses show that not all attributes are functionally dependent on EmpID and some values are not atomic.

    Company(<u>EmpID</u>, EmpName, EmpAddr, <u>ProjID</u>, ProjName, MgrID, MgrName, HoursWorked)

    b. No, because there are redundancies that cause anomalies and there are non-prime attributes that are not fully dependent.

    Company(<u>EmpID</u>, <u>ProjID</u>, HoursWorked)
    Employee(<u>EmpID</u>, EmpName, EmpAddr)
    Projects(<u>ProjID</u>, ProjName, MgrID, MgrName)

    c. No, because there's a non-prime attribute that functionally determines another non-prime attribute, which violates 3NF.

    Company(<u>EmpID</u>, <u>ProjID</u>, HoursWorked)
    Employees(<u>EmpID</u>, EmpName, EmpAddr)
    Projects(<u>ProjID</u>, ProjName, MgrID)
    Managers(<u>MgrID</u>, MgrName)

3.

    a. No, there are attributes that are not atomic, and there is no proper primary key that is chosen.

       Property(<u>id</u>, county, lotNum, lotArea, price, taxRate, <u>datePaid</u>, amount)

    b. No, there are redundancies present. Since we have primary key (id, datePaid), the non-prime attributes that are only dependent on id are violating 2NF.

       Payment(<u>id</u>, <u>datePaid</u>, amount)
       Property(<u>id</u>, county, lotNum, lotArea, price, taxRate)

    c. No, there are a lot of non-prime attributes that functionally determine other non-prime attributes.

       Payment(<u>id</u>, datePaid, amount)
       Property(<u>id</u>, county, lotArea)
       Price(<u>lotArea</u>, price)
       Taxes(<u>county</u>, taxRate)

4.

    a. Yes

    b. No, there are some redundancies. All attributes need to depend on Symbol and Date.

       StockExchange(Company, <u>Symbol</u>, HQ, <u>Date</u>, ClosePrice)

    c. Yes.