بسمه تعالی

	پاسخ تمرین اول درس اصول و طراحی پایگاه داده دکتر ممتازی ترم پائیز ۱۳۹۹ – دانشکده کامپیوتر، دانشگاه صنعتی امیرکبیر

(1)

a) نادرست
b) درست
c) نادرست
d) درست
e) درست
f) درست

(2)

a) $\pi_{Year, Title}(Books)$

b) $\sigma_{Field = "Computer\ Engineering"}(STUDENTS)$

c) $\sigma_{Publisher = "AUT" \wedge Year < 1398}(Books)$

d) $\pi_{AName}(\sigma_{city = "Tehran"}(AUTHORS))$

e) $\pi_{stName}(\sigma_{Age > 25}(STUDENTS)) - \pi_{stName}(\sigma_{Field = "computer\ Engineering"}(STUDENTS))$

f) $\pi_{Title}(\sigma_{Field = "CE"}(BORROWS \bowtie STUDENTS \bowtie Books))$

g) $\pi_{title}(\sigma_{AName = "Harrison}(HAS\_WRITTEN \bowtie Books)$

h) $\pi_{stName, Age}(\sigma_{Field = "CE"}(STUDENTS)) -$

$$\pi_{s_1.stName, s_1.Age}(\sigma_{s_1.Field = "CE" \wedge s_2.Field = "CE" \wedge s_1.Age > s_2.Age}(\rho_{s_1}(STUDENTS) \times \rho_{s_2}(STUDENTS)))$$

i) $\pi_{AName}(\sigma_{stName = "carlos"}(STUDENTS \bowtie BORROWS \bowtie HASWRRITTEN))$

(۳)

a) $\pi_{NationalID}(\sigma_{birth\ city = "Tehran"}(People)) \cup \pi_{NationalID}(\sigma_{birth\ city = "Shiraz"}(People))$

b) $\pi_{Name}(\sigma_{birth\ city = "Tabriz" \wedge Birth\ Date = 1377}(People))$

c) $\pi_{NationalID}(\sigma_{Birth\ Date < 1377}(people))$

d) $\pi_{Name, BirthDate}(\sigma_{FatherID = 1061426286}(People)) \cup \pi_{Name, BirthDate}(\sigma_{mother\ ID = 1061426286}(People))$

e) $\pi_{Name}(\sigma_{NationalID = 0826241601}(\sigma_{P_1.FatherID = P_2.FatherID} \wedge P_1.motherID = P_2.motherID (\rho_{P_1}(People) \times \rho_{P_2}(People))))$

f) $\pi_{P_1.NationalID}(\sigma_{P_1.FatherID = P_2.NationalID} \wedge P_1.city = P_2.city \wedge P_1.motherID = P_3.NationalID \wedge P_1.city = P_3.city (\rho_{P_1}(People) \times \rho_{P_2}(People) \times \rho_{P_3}(People)))$

g) $\pi_{P_1.Name, P_1.NationalID}(\sigma_{P_1.FatherID = P_2.FatherID} \wedge P_1.motherID = P_2.motherID \wedge P_1.BirthDate > P_2.BirthDate (\rho_{P_1}(People) \times \rho_{P_2}(People)))$

h) $\rho_{father} : (\pi_{fatherID}(\sigma_{NationalID = 1061426286}(People)))$

$\rho_{grandfather} : (\pi_{P_1.fatherID}(\sigma_{P_1.NationalID = father.NationalID}(\rho_{P_1}(People) \times father)))$

$\pi_{P_2.Name, P_2.NationalID}(\sigma_{P_2.fatherID = grandfather.NationalID} \wedge P_2.NationalID \neq father.NationalID$

i) $\pi_{P_1.Name}\left(\sigma_{\substack{P_1.motherID=P_2.motherID \\ \wedge P_1.FatherID=P_2.motherID \\ \wedge P_1.BirthDate=P_2.BirthDate \\ \wedge P_1.NationalID \neq P_2.NationalID}}\left(\rho_{P_1}(People) \times \rho_{P_2}(People)\right)\right)$

(۴)

a) لیست اجناسی که تاریخ خرید آن‌ها قبل از سال ۲۰۲۰ است.

b) نام مشتریانی که در سال ۲۰۲۰ خرید داشته اند.

c) نام مشتریانی که خریدی نداشته اند.