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Q1) Relational model

PK
Applicant(user-id, gender, region, city, country, email, Date of birth, Phone-num, First-Name, Middle-Name, Last-Name)

PK
College(Name, city, country, ranking)

⇒ written as college-id in ERD by mistake.
Faculty(college-name, faculty-id, First-Name, Last-Name,
FK(College)
PK
tenure, Num_of_Pub)

Publications(College-name, faculty-id, Publication-title)
FK(College), FK(faculty)
PK

Application(Application-Num, Semester, user-id, Year, GPA,
FK(Applicant)
PK
App-Date, ref 1, ref 2, ref 3)

Q2) Branch (Branch-id, Branch-name, location)
PK

Book (ISBN, title, Copy-Num, Publisher, Category)
PK FK(Publisher)

Publisher (Name, Address, email)
PK

PublisherNums (Number, Name)
FK(Publisher)

Buyer (email, Name, Gender)
PK

Book-Copies (Copy-Number, branch-id, num-of-copies)
FK(book) FK(branch)
PK

Transactions (Ref-id, user-id, book-ISBN, email, branch-id,
PK FK(Buyer) FK(Book) FK(Buyer) FK(branch)
transaction-date)

Authors (Author-name, Book-ISBN)
FK(Book)
PK

Q3) Department (Dep-id, Name, Chairman)
PK

Doctor (Synd-id, First-Name, Last-Name, status, specialization,
PK
Dep-id)
FK(Department)

Lab (lab-id, lab-name, manager)
PK

Services (service-name, cost, lab-id, lab-name)
PK FK(Lab)

Patient(National-id, First-Name, Last-Name, Phone #, Address,
PK
dep-id)
FK(Department)

Lab tests (National-id, service-name)
FK(Patient) FK(services)
PK

Supervision (Synd-id, National-id)
FK(Doctor) FK(Patient)
PK

Bed (Assigned-num, dep-id, category-name, National-id)
FK (Department) FK (Bed-category) FK (Patient)

PK

Bed-Category (Category-name, cost)
PK

Q4) Flight (Flight-Num, operation-days)
PK

Airport (Code, name, city)
PK

Airplane-types (type-name, manufacturer)
PK

SeatNums (Airplane-type-name, Fare-type, seat-num)
FK (Airplane-types) FK (Fares)
PK

Airplane (Airplane-Num, Airplane-type-name, status)
FK (Airplane-types)
PK

Allowed-types (Airport-code, Airport-Name, Airplane-type)
FK(Airport) FK(Airplane-types)

PK

Flight-leg (Flight-Num, number, dep-airport-id,
FK(Flight) FK(Airport)

PK

arrival-airport-id, scheduled-dep-time, scheduled-
FK(Airport)
arrival-time)

leg-instance (Flight-leg, day, actual-dep, actual-arrival,
FK(Flight-leg)

PK

Airplane)
FK(Airplane)

Fares (Flight-Num, number, type, price)
FK(Flight-leg)

PK