ASSIGNMENT 2 (INDIVIDUAL) – NORMALIZATION (SCHEMA)

Examine the Patient Medication Form for the Kuala Lumpur General Hospital case study as shown in the Figure below: **(20 Marks)**

Kuala Lumpur General Hospital
Patient Medication Form

Patient Number: P10034 Doctor Incharge: Dr. Gurdeep Singh (ID:681)

Full Name Robert MacDonald Ward Number Ward 11

Bed Number 84 Ward Name Orthopaedic

Drug Number	Name	Description	Dosage	Method of Admin	Units per Day	Start Date	Finish Date
10223	Morphine	Pain killer	10mg/ml	Oral	50	24-Mar-04	24-Apr-04
10334	Tetracycline	Antibiotic	0.5mg/ml	IV	10	24-Mar-04	17-Apr-04
10223	Morphine	Pain killer	10mg/ml	Oral	10	25-Apr-04	2-May-04

Questions:

(a) Identify the **functional dependencies** represented by the data shown in the form above.

Answer (6 Marks)

patientNo → fullName
doctorID → doctorIncharge
wardNo → wardName
wardName → wardNo
drugNo → name, description, dosage, methodOfAdmin
patientNo, drugNo, startDate → unitsPerDay, finishDate

The functional dependencies for **bedNo** are unclear. If **bedNo** was a unique number for the entire hospital, then could say that **bedNo** → **wardNo**. However, from further examination of the requirements specification, we can observe that **bedNo** is to do with the allocation of patients on the waiting list to beds. Meanwhile, assume one patient registered once for a day.

(b) Describe and illustrate the process of normalizing the data shown in the form to **First (1NF), Second (2NF), and Third (3NF)**.

Answer (8 Marks)

First Normal Form (1m)
patientNo, doctorID, drugNo, startDate, fullName, doctorIncharge, wardNo, wardName, bedNo, name, description, dosage, methodOfAdmin, unitsPerDay, finishDate

Second Normal Form (3m)
patientNo, drugNo, startDate → wardNo, wardName, bedNo, unitsPerDay, finish Date
drugNo → name, description, dosage, methodOfAdmin
patientNo → fullName, doctorID, doctorIncharge

Third Normal Form (4m)
patientNo, drugNo, startDate → wardNo, bedNo, unitsPerDay, finish Date
drugNo → name, description, dosage, methodOfAdmin
patientNo → fullName, doctorID
wardNo → wardName
doctorID → doctorIncharge

(c) Because every determinant in the relations is a candidate key. **(2m)**

(d) Identify the primary, alternate, and foreign keys in your 3NF relations.

Answer **(4 Marks)**

Patient (patientNo (FK), drugNo(FK), wardNo(FK), startDate, bedNo, unitsPerDay, finish Date)
Primary Composite key: {patientNo, drugNo, wardNo} (1m)

Drug (drugNo(PK), name, description, dosage, methodOfAdmin)
Primary key: drugNo (1m)

PatientName (patientNo(PK), fullName, doctorID (FK))
Primary key: patientNo (1m)

Ward (wardNo(PK), wardName)
Primary key: wardNo (0.5m)

DoctorforPatient (doctorID (PK), doctorIncharge)
Primary key: doctorID (0.5m)