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Database Management System (See- A) **Marks-15**

CT-1 **Time: 45 Mins**

A **Smart Hospital Information System (SHIS)** manages patients, doctors, treatments, and hospital resources. Each **Patient** is uniquely identified by **patientID** and has attributes **name, dateOfBirth, gender, bloodGroup,** and **contactNumber**. Each **Doctor** has a unique **doctorID, name, specialization,** and **designation**. Doctors may work in **multiple departments**. Each **Department** has a **departmentID, departmentName,** and **floorNumber**. Patients are admitted to the hospital through **Admissions**. An **Admission** records **admissionDate, dischargeDate,** and **admissionType** (emergency/regular). An admission **cannot exist without a patient,** and a patient may have **multiple admissions** over time. During an admission, patients are assigned to **Rooms**. Each **Room** is identified by **roomNumber** and has attributes **roomType** and **dailyCharge**. A room can accommodate **multiple patients over time, but only one patient at a time**. Patients receive **Treatments** during an admission. Each treatment has a **treatmentID, treatmentName,** and **cost**. A patient may receive multiple treatments, and the same treatment may be given to many patients. Doctors **prescribe treatments** to patients during an admission. A prescription records **prescriptionDate, dosage,** and **duration**.

1. **Draw the ER Diagram (ERD)** for the SHIS scenario. 6
   - Show **all entities and attributes**
   - Clearly mark **primary keys and foreign keys**
   - Show **relationships** with correct **cardinality and participation constraints**

2. Identify all **strong and weak entities** in the system and **justify** your choices. 2

3. Justify the **cardinality and participation constraints** between: 2
   - Patient and Admission
   - Admission and Room
   - Doctor and Treatment

4. Justify the need for **associative entities** in this ERD. 1

5. Distinguish between DDL and DML. Give an example from the above scenario. 4