

**School of Information Technology
IIT Kharagpur**

Course Id: IT60113 Advanced Database Systems

Class Test 1

Date: August 18, 2010

Total Time: 1 Hour

Max. Marks: 30

Clearly write any reasonable assumption that you make

1. Consider the following database application.

A hospital needs to store information about its patients (identified by PatID with Patient-Name, Address, Disease and Medicines_prescribed as attributes). A patient may be prescribed multiple medicines but can have only one disease. A patient is admitted to a ward and is assigned to a bed. A hospital can have several wards (identified by ward_No, with ward_name as a second attribute) and each ward has a number of beds. The attributes of a Doctor are EmpID (unique), Doctor_Name and specialization. A doctor may be attached to multiple wards and several patients may be under his care. A ward can have multiple doctors attached to it. When a patient is admitted, information about the date of admission, the ward_No, Bed_No (unique within a ward but not across all wards), and the doctor who would be attending the patient are also maintained. The number of available beds in a ward has to be suitably maintained, which is modified when a patient is admitted or released from the ward.

- (a) Draw an ER diagram that can represent the above information. **10**
- (b) Derive a relational model from the ER model. The number of relations should be minimized. Clearly identify primary and foreign keys. **8**
- (c) Based on the relations, express the following queries using SQL **2×4=8**
- i. Find the patients who are under Dr. A Basu (Doctor's name) along with their ward name and bed number.
 - ii. Find the names of doctors attached to more than one ward.
 - iii. Find the wards in which no bed is currently available.
 - iv. Find the number of patients in each ward (Mention ward_name and NOT ward_No.).
- (d) Express query numbers i and iii of (c) above using relational algebra. **2+2=4**