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 EmplID (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 2x4=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