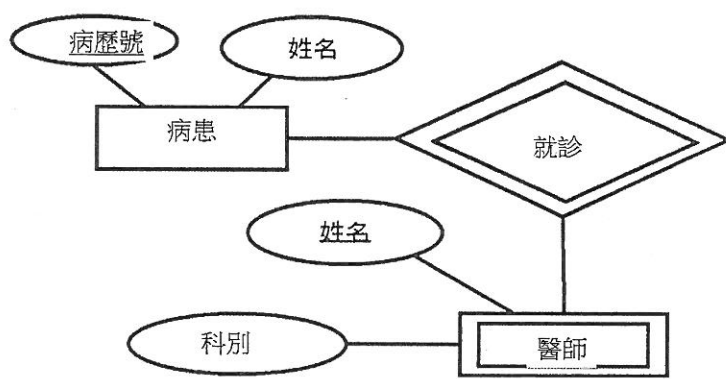1. Briefly describe the following terms occurring in Database (20% (4% for each))
   a. two-phase locking
   b. lock compatible table
   c. update anomaly
   d. concurrent control
   e. Rollback

2. (a) For the following E-R diagram, please design the database schema for it. We assume a patient can visit the doctors many times, and a doctor can care many patients. The attributes in circles with underline means the primary key. (b) What is the problem that the name (姓名) for the 醫師 is set as a primary key? (20%)

3. The following is the course-student-teacher tables, containing the student number, student's birthday, student name, course number, course name, credit of the course, number of students for the course, student's score for the course, and the class room with the teaching time for a course. Please transform the unnormalized table into the 3NF table through 1NF, and 2NF Tables. (20%)

Stud ent#	Birth Date	Name	Course #	Course name	Teacher	Cred it	# of students	Score	Class room
14	12/6	Lee	mis38	DB	John	3	2	90	MB101 (3 hours)
14	12/6	Lee	mis40	MIS	Mary	2	1	80	MB349(1 hour), MB102(1 hour)
15	1/6	Pat	mis38	DB	John	3	2	70	MB101(3 hours)

4. For a DBA, he/she may use the ER-model to model the world; but for a programmer, he/she may use objects and classes to model the world. (a) What is the difference between the ER-model and object diagrams? (b) If you get the ER-model and object diagrams for a same project to be coded, how do you merge the two models for programming? (20%)

5. For the following two tables of a bank, please write the (standard) SQL statements for the following assertions.

Staff

staffNo	sName	position	salary	branchNo
SL21	John White	Manager	30000	B005
SG37	Ann Beech	Assistant	12000	B003
SG14	David Ford	Supervisor	18000	B003
SA9	Mary Howe	Assistant	9000	B007
SG5	Susan Brand	Manager	24000	B003
SL41	Julie Lee	Assistant	9000	B005

Branch

branchNo	bAddress
B005	22 Deer Rd, London
B007	16 Argyll St, Aberdeen
B003	163 Main St, Glasgow

a. show the staff's name and position if his/her salary is over 10000;
b. find the staff (name) if he/she work in London
c. Update the branch B007's address to "168 university RD, Chia-Yi"
d. Find all the branch's staffs, please group by the branch and sort them by their salary from high to low.
   (20% (5% for each))