6. a) What is PL/SQL in oracle? 4
   b) What is single row select statement? 4
   c) Consider the relations : SUBJECT (**SCODE**, SNAME) and RESULT (**SCODE, Roll,** MARKS)
   Write a PL/SQL block to display SNAME and Roll of the student(s) with highest marks in each subject. In a subject, more than one student may score highest marks. 7
   d) What is a trigger? How do you specify that when it will be fired? 5
7. a) Two-phose locking protocol is not deadlock free discuss with example. 5
   b) What is a recoverable schedule? 4
   c) In a concurrent schedule, what is non conflicting swap? 4
   d) Discuss checkpoint based recovery scheme in a concurrent environment? 7
8. Write short notes on the following :
   a) Various states of a transaction.
   b) Security features in DBMS
   c) Functional components of DBMS
   d) Weak entity set. 5x4

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BACHELOR OF COMPUTER SC. ENGG. EXAMINATION, 2010

(3rd Year, 1st Semester)

DATABASE MANAGEMENT SYSTEM

Time : Three hours Full Marks : 100

Attempt any ***five*** Questions

1. a) What is candidate key? How do you select PK? 4
   b) What is data redundancy? Why do we try to remove it? 4
   c) What is foreign key? How does it influence DML operation? 6
   d) What are dangling tuples and spurious tuples? 6
2. a) What is ER diagram? In designing the database, how will you realize the relations in ER diagram? 6
   b) Consider the system described below. In a hospital, various units are there. Each doctor is associated with one unit. A partient gets enrolled into a unit under one of the doctors in the unit. It required, he may be treated by other doctors of same /different units also. Doctors suggests vorious tests for the patients, those are noted along with their reports. System also keeps

the details of units, doctors, patient, enrolled under whom, what tests suggested by whom ect.

Draw the ER diagram with mapping cordinality. 8

c) In a tennis tournament,organisers note the performance and personal details of each tennis players (men/ women both) for men, women and mixed doubles, the pair informations are also noted . Draw the ER diagram for the scenario. 6

3. a) What is normalization? In order to be in 3NF, a relation must be in 2NF – explain. 6

b) Consider a scheme to the store the marks in all subjects for all students. For each subject following information is stored: sub-code (unique for a subject), sub-name, full-marks, pass-marks, examiner-name, examiner-address, examiner-phone and (roll, name, marks-scored) of all students appearing in the subject. Assume, examiner-name and roll are unique for examiner and student respectively.

Normalize upto 3NF showing staps and indicating PK and FK. 10

4. Consider the following relations :

STUDENT (**Roll,** Name)

ASSIGNMENT (**ASSGN – NO,** DUE– DT, Full - Marks)

SUBMISSION (**ASSGN – No, Roll,** SUBM – DT, MARKS- SCORED).

a) Write the SQL statements for the following:

i) In SUBMISSION, set MARKS – SCORED as zero for the assignments submitted after due date. 3

ii) For each assignment, find how many have scored full marks. 4

iii) find the roll number of the students who have submitted all the assignments. 4

iv) For each student find the total Score. 3

b) Write relational Calculus and relational algebra expression to find out the roll number of the Students who have Submitted all assignments within due date. 6

5. a) 'Primary Index is a spare index'– explain. 4

b) What is the utility of secondary index? 4

c) Consider, a relation, EMP is holding the Information of all employees. Very often, we need to get the employee-into corresponding to a department asked by user. But finding out of the details corresponding to an employee code is more frequent. Propose and justify a scheme to support the query requirement. 6

d) Suppose R1 and R2 are to be joined. Join attribute is PK of Rl and FK of R2. Discuss a join Strategy. You are allowed to create necessary indices but ordering of data in the files can not be changed. Assume, site of R2 is much larger than R1. 6