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ASSIGNMENT 4

PART B (MODULE III)			
		15 Marks Questions *Each question can have maximum four sub division* ***(Prepare maximum Questions possible, covering all areas of the modules assigned)***	Marks
1	(a)	Consider an EMPLOYEE file with 10000 records where each record is of size 80 bytes. The file is sorted on employee number (15 bytes long), which is the primary key. Assuming un-spanned organization, block size of 512 bytes and block pointer size of 5 bytes, compute the number of block accesses needed for retrieving an employee record based on employee number if (i) No index is used (ii)Multi-level primary index is used	( )

2		Consider a file with 2,00,000 records stored in a disk with fixed length blocks of size 256 bytes. Each record is of size 50 bytes. The primary key is 4 bytes and block pointer is 6 bytes. Compute the following, assuming that multi-level primary index is used as access path: (10) (i) Blocking factor for data records (ii) Blocking factor for index records (iii) Number of data blocks (iv) Number of First level index blocks (v) Number of levels of multi level index	( )
3		Suppose that we have an ordered file with 400,000 records stored on a disk with block size 4,096 bytes. File records are of fixed size and are unspanned,with record length 200 bytes. 1. How many blocks are needed for the file? 2. Approximately, how many block accesses are required for a binary search in this file? On an average, how many block accesses are required for a linear search, if the file is nonordered Based on question give an example to illustrate that indexing can improve the search time.	
4		Consider a file with 450000 records . Each record size is 125 bytes and block is 1000 bytes. The primary key of the file is 10 bytes and record pointer size is 6 bytes. 1). Calculate number of index block required in case of primary indexing 2) Calculate number of index blocks required in case of multilevel indexing	
5		Suppose that we have an ordered file with r=30000 records stored on a disk with block size B =1024 bytes. File records are of fixed length and are un-spanned with record length R =100 bytes. Assume that the file is ordered on the attribute V of length 9 bytes and the block pointer length P= 6 bytes. Compute the number of block access for the file i. Binary search (no index)	

		ii. Search a record using Primary index	
6		There are 12000 records in a data file. Each record in the file is of 75 bytes. Compute the number of block accesses if (i) Single level secondary index is available on a field of size 15 bytes. (ii) Multilevel index is available on the same field. Assume that the block size is 394 bytes, that un-spanned organization is used and that block and record pointers are 5 and 7 bytes, respectively	
7		Consider the following schema and write SQL queries to find: STUDENT (rollNo, name, degree, year, sex, deptNo, advisor) DEPARTMENT (deptId, name, hod, phone) PROFESSOR (empId, name, sex, startYear, deptNo, phone) COURSE (courseId, cname, credits, deptNo) ENROLLMENT (rollNo, courseId, sem, year, grade) TEACHING (empId, courseId, sem, year, classRoom) PREREQ(preCourseId, courseId) i. Get the employee Id, name and phone number of professors in the CS dept (deptNo= 3) who have joined after 1999. ii. Get the rollNo, name of students in the CSE dept (deptNo= 3) along with their advisor’s name and phone number.	( )

		iii. Get the rollNo, name of students who have a lady professor as their advisor. iv. Get the roll number and name of students whose gender is same as their advisor's.	
8		Consider the schema given below. person (driver-id, name, address) car (reg-no, model, year, driver-id) accident (report-number, date, location) participated (driver-id, reg-no, report-number, damage-amount) Write SQL queries for the following a. Find the name of driver, who is drives the car with reg-no='AABB2000'. Find the total number of people who were involved in car accidents in 01-01-1989. c. Find the number of accidents in which the cars belonging to "John Smith" were involved. d. Update the damage amount for the car with reg-no "AABB2000"in the accident with report number "AR2197" to $3000	( )
9		Consider the following relations for bank database (Primary keys are underlined): Customer (customer-name, customer-street, customer-city) Branch (branch-name, branch-city, assets) Account (account-number, branch-name, balance) Depositor (customer-name, account-number) Loan (loan-number, branch-name, amount)	

		Answer the following in SQL: i) Create tables with primary keys and foreign keys ii) Create an assertion for the sum of all loan amounts for each branch must be less than the sum of all account balances at the branch	
10		In the following tables ADVISOR and TAUGHTBYare foreign keyd referring to the table PROFESSOR. ROLLNO and COURSEID in ENROLLMENT refer to tables with primary keys of the same name. STUDENT(ROLLNO, NAME, AGE, GENDER, ADDRESS, ADVISOR) COURSE(COURSEID, CNAME, TAUGHTBY, CREDITS) PROFESSOR(PROFID,PNAME, PHONE) ENROLLMENT(ROLLNO, COURSEID, GRADE) Write SQL expressions for the following queries: (i) Names of courses taught by ‘Prof. Raju’. (ii) Names of students who have not enrolled for any course taught by ‘Prof. Ganapathy’. (iii) For each course, name of the course and number of students enrolled for the course.	
11		Consider the following relations: FACULTY(FNO, NAME, GENDER, AGE, SALARY, DNUM) DEPARTMENT(DNO, DNAME, DPHONE) COURSE(CNO, CNAME, CREDITS, ODNO) TEACHING(FNO, CNO, SEMESTER)	

		DNUM is a foreign key that identifies the department to which a faculty belongs. ODNO is a foreign key identifying the department that offers a course. Write SQL expressions for the following queries: a) Course numbers and names of 3-credit courses offered by ‘CS’ department b) Names of faculty members teaching maximum3 courses c) Names of departments along with number of courses offered by each of them, in the increas-ing order of number of courses; exclude departments which do not offer any course	
12		Consider two tables STUDENT(ENROLLMENT(ROLLNO,COURSENAME ENROLLMENT is a foreign key referring to every time a STUDENT tuple is deleted, all the ENROLLMENT tuples referring to the deleted STUDENT tuple are also deleted. Write SQL statements to specify this foreign key requirement	
13		Write SQL DDL commands to construct the 'Catalog' table in the following relations Suppliers(sid: integer, sname: string, address: string) Parts(pid: integer, pname: string, color: string) Catalog(sid: integer, pid: integer, cost: real)	( )

		Include the primary key and referential integrity constraints in the table.	
14		Given two tables STUDENT(ENROLLMENT(ROLLNO,COURSENAME refers to STUDENT, what does the following SQL statement return? SELECT COURSENAME FROM ENROLLMENT WHERE ROLLNO = ALL (SELECT ROLLNO FROM STUDENT)	( )
15		Consider the following relations: FACULTY(FNO, NAME, GENDER, AGE, SALARY, DNUM) DEPARTMENT(DNO, DNAME, DPHONE) COURSE(CNO, CNAME, CREDITS, ODNO) TEACHING(FNO, CNO, SEMESTER) DNUM is a foreign key that identifies the department to which a faculty belongs. ODNO is a foreign key identifying the department that offers a course.Write SQL expressions for the following queries: (a) Names and department names of faculty members. (b) Names of faculty members not offering any course. (c) Names of departments offering more than three courses, in alphabetic order.	( )