

B.E./B.TECH. Degree Examination, December 2020
Third Semester
CS18302-DATABASE MANAGEMENT SYSTEMS
(Regulation 2018)

Time: Three hours

Maximum : 80 Marks

Answer **ALL** questions**PART A - (8 X 2 = 16 marks)**

1. What do you mean by one to many relationship between Teacher and Class table?
 - A. One class may have many teachers
 - B. One teacher can have many classes
 - C. Many classes may have many teachers
 - D. Many teachers may have many classes
2. Two tables can be linked with relationship to _____.
 - A. Ensure data entry
 - B. Ensure data integrity
 - C. Create Primary Key
 - D. Ensure Foreign Key
3. `SELECT name ____ instructor name, course id FROM instructor, teaches`
`WHERE instructor.ID= teaches.ID;`
Which keyword must be used here to rename the field name?
 - A. From
 - B. Rename
 - C. As
 - D. Join
4. `SELECT COUNT (____ ID) FROM teaches WHERE semester = 'Spring' AND YEAR = 2010;`
If we do want to eliminate duplicates, we use the keyword _____ in the aggregate expression.
 - A. Distinct
 - B. Count
 - C. Avg
 - D. Primary key
5. Give example of decomposition which is loss less but not dependency preserving.
6. Differentiate strict two phase locking protocol and rigorous two phase locking protocol.
7. How the reliability can be improved through redundancy?
8. Illustrate various guidelines in OLAP.

PART B - (4 X16 = 64 marks)

09. (a) (i) Illustrate the architecture of DBMS with example. (8)
 (ii) Discuss on Relational calculus? Illustrate tuple and domain relational calculus with queries. (8)

(OR)

- (b) For the following relation schema: employee(employee-name, street, city) (16)
 works(employee-name, company-name, salary) company(company-name, city)
 manages(employee-name, manager-name) Give an expression in SQL for each of the following queries:

- Find the names, street address, and cities of residence for all employees who work for 'First Bank Corporation' and earn more than \$10,000.(3)
- Find the names of all employees in the database who live in the same cities as the companies for which they work.(3)
- Find the names of all employees in the database who live in the same cities and on the same streets as do their managers.(3)
- Find the names of all employees in the database who do not work for 'First Bank Corporation'. Assume that all people work for exactly one company(2)
- Find the names of all employees in the database who earn more than every employee of 'Small Bank Corporation'. Assume that all people work for at most one company(3)
- Assume that the companies may be located in several cities. Find all companies located in every city in which 'Small Bank Corporation' is located.(2)

10. (a) (i) Consider the universal relation $R = \{ A, B, C, D, E, F, G, H, I \}$ and the set of functional dependencies $F = \{ (A, B) \rightarrow \{ C \}, \{ A \} \rightarrow \{ D, E \}, \{ B \} \rightarrow \{ F \}, \{ F \} \rightarrow \{ G, H \}, \{ D \} \rightarrow \{ I, J \} \}$. what is the key for Decompose R into 2NF, the 3NF relations. (8)
 (ii) How can you compare various Normalization techniques? Justify your comparison with suitable example. (8)

(OR)

- (b) A university registrar's office maintains data about the following entities: (16)
 (a) courses, including number, title, credits, syllabus, and prerequisites;
 (b) course offerings, including course number, year, semester, section number, instructor(s), timings, and classroom;
 (c) students, including student-id, name, and program; and
 (d) instructors, including identification number, name, department, and title. Further,

the enrollment of students in courses and grades awarded to students in each course they are enrolled for must be appropriately modeled.

Construct an E-R diagram for the registrar's office. Document all assumptions that you make about the mapping constraints.

11. (a) (i) How can we achieve concurrency control in DBMS through Serializability? (8)
 (ii) What is your opinion on deadlock prevention schemes? Illustrate with an example. (8)

(OR)

- (b) (i) How can you compare the deferred and immediate-modification version of the log-based recovery scheme? (8)
 (ii) What explanation do you have for various recovery techniques during transaction in detail with an example? (8)

12. (a) (i) How would you demonstrate the B+ tree index file structure? (8)
 (ii) Illustrate the steps involved in Query processing. How would you estimate the cost of query? (8)

(OR)

- (b) (i) How would you explain about (8)
 (i) Native XML database. (4)
 (ii) Web databases. (4)
 (ii) Why do you think cloud storage is important? Illustrate its working and usage with a neat diagram. (8)