

6. (a) Explain the major components of DBMS. (8)
(b) Explain 2-tier and 3-tier client server architecture of DBMS. (7)
7. Differentiate between the following :
(i) Procedural and non-procedural DBMS.
(ii) Recoverable and non-recoverable schedules.
(iii) Database approach and traditional file system. (15)
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Roll No.

Total Pages : 4

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December, 2019
MCA Ist Semester
Database Management Systems (MCA-17-109)

Time : 3 Hours]

[Max. Marks : 75

Instructions :

1. It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.
2. Answer any four questions from Part-B in detail.
3. Different sub-parts of a question are to be attempted adjacent to each other.

PART - A

1. (a) What is transaction log? Mention its content. (1.5)
(b) What is a project operation? (1.5)
(c) Explain the difference among Entity, Entity Type & Entity Set. (1.5)
(d) What is a view? (1.5)
(e) Differentiate between theata join and equi join. (1.5)

- (f) What is a weak entity? Explain with example. (1.5)
- (g) Differentiate between DDL and DML. (1.5)
- (h) Define Data Abstraction and list the levels of Data Abstraction. (1.5)
- (i) What is COMMIT Point? (1.5)
- (j) What do you mean by locking? (1.5)
2. (a) Explain Two phase locking protocol in detail. (8)
- (b) Define BCNF. How does it differ from 3NF. (7)
3. (a) Draw an E-R Diagram for Hospital Management System considering various entities and attributes. Determine the various relationships. (7)
- (b) Discuss the Armstrong's inference rules for functional dependencies. (8)
4. (a) What are the different types of database end users? Discuss the main activities of each. (7)
- (b) What do you mean by serializable schedules? Discuss wait-die and wound-wait approaches for deadlock avoidance. (8)

5. (a) Consider the following relational schema:
 Employee (empno, name, office, age)
 Books (isbn, title, authors, publisher)
 Loan (empno, isbn, date)
 Write the following queries in relational algebra.
- (a) Find the names of employees who have borrowed a book Published by McGraw-Hill.
- (b) Find the names of employees who have borrowed all books Published by McGraw-Hill.
- (c) Find the names of employees who have borrowed more than five different books published by McGraw-Hill.
- (d) For each publisher, find the names of employees who have borrowed more than five books of that publisher. (8)
- (b) Consider the given set of functional dependencies for the relation $R(A, B, C, D, E, F, G)$
 $F = \{AD \rightarrow BF, CD \rightarrow EGC, BD \rightarrow F, E \rightarrow D, F \rightarrow C, D \rightarrow F\}$
- (i) Find the minimal cover for the above set of functional dependencies.
- (ii) Using the functional dependencies computed above, find the keys for this relation. Is the relation in BCNF? Give reasons. (7)