

- (d) Create one more relation Pet-age based on one relation Pet with attributes Pet-id, name, age (Compute from values in relation pet).
- (e) Show list of pets whose name is of five character long and age is between 10 and 20 year.
- (f) Delete all attributes of defined relation. Then drop relations and then drop declared DB.
7. (a) In designing a relational database, why might we choose a non-BCNF design ?
- (b) A functional dependency $\alpha \rightarrow \beta$ is called partial dependency if there is a proper subset γ of α such that $\gamma \rightarrow \beta$. We say that β is partially dependent on α . A relation schema R is in 2nd normal form if each attribute A in R meets one of the following criteria :
- It appears in a candidate key.
 - It is not partially dependent on a candidate key.

Show that every 3NF schema is in 2NF.

8. Make a list of security concerns for a bank. For each item on your list, state whether this concern relates to physical security, human security, operating-system security or database security.

9. Define the following :

- (a) Concurrency transaction processing
- (b) Database recovery techniques
- (c) Authorization in concurrency control
- (d) Database recovery techniques

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2,500

(C-97)

Roll No. 0802508

BCA-501(N)

B. C. A. (Fifth Semester)

EXAMINATION, Nov./Dec., 2018

(New Course)

Paper First

INTRODUCTION TO DBMS

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt questions from all Sections as directed.

Inst. : The candidates are required to answer only in serial order. If there are many parts of a question, answer them in continuation.

Section—A

(Short Answer Type Questions)

Note : All questions are compulsory. Each question carries 3 marks.

1. (A) Define Data models.
- (B) What is the role of E-R model in RDBMS ?
- (C) Differentiate EER and ER diagram.
- (D) Define B^+ tree.
- (E) What is three-schema architecture ?
- (F) List the roles of DBA and database designers.

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- (G) Discuss some types of database utilities and tools and their functions.
- (H) Differentiate two-tier and three-tier client/server architectures.
- (I) With what other computer system software does a DBMS interact ?

Section—B

(Long Answer Type Questions)

Note : Attempt any two questions. Each question carries 12 marks.

2. A database is being constructed to keep track of the teams and games of a sport tournament. A team has a number of players, not all of whom participate in each game, it is desired to keep track of the players participating in each team, the positions they played in that game, and the result of the game. Design ER schema diagram for this application, stating any assumptions you make. Choose your favorite sports (like cricket, football, hockey).
3. Discuss Data Independence in detail.
4. Consider a University database for the scheduling of classrooms for final exam. This database could be modeled on the single entity set exam, with attributes course-name, section-number, room-number, and time. Alternatively one or more additional entity sets could be defined, along with relationship sets to replace some of the attributes of the exam entity set, as :
 - Course with attributes name, department and course-number.

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- Section with attributes section-number and enrollment, and dependent as a weak entity set on course.
 - room with attributes room-number, capacity and building.
- (a) Draw suitable entity Relationship diagram with use of all three additional entity sets listed.
 - (b) Explain what application characteristics would influence a decision to include or not to include each of the additional entity set.
5. (a) In the sequential file organization, why is an overflow block used even if there is, at the moment, only one overflow record ?
 - (b) What is extendible hashing ?
 - (c) What are the dynamic hashing approach ?

Section—C

(Long Answer Type Questions)

Note : Attempt any two questions. Each question carries 12 marks.

6. For a Pet relation, whose attributes are Pet-id, name, owner, species, sex, birth-date and death-date, define relational queries for the following tasks on SQL engine :
 - (a) Check on which DB you are, exit from that and then create DB for asked relation.
 - (b) Create relation on newly DB by assuming one attribute as primary key with death-date may be NULL.
 - (c) Insert at least five tuple values for relation pet either by typing values at run time or by loading the value from text file.

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