

GUJARAT TECHNOLOGICAL UNIVERSITY
MCA SEM-I Examination- Jan.-2012

Subject code: 610005**Date: 07/01/2012****Subject Name: Database Management System – I****Time: 10.30 am-1.00 pm****Total marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Q.1 (a) Mark True or False. Justify your answer. **07**

1. The overall logical structure of a database can be expressed graphically by Entity Relationship Diagram.
2. Entity integrity says that every entity has exactly one primary key.
3. The description of only a part of database is called Schema.
4. Metadata is data above data.
5. Normalisation is a process of breaking complex table into smaller one.
6. When all information found in original table preserves after decomposition, we call it as lossless decomposition.
7. Primary key and Unique key are same.

(b) Fill in the blanks : **07**

1. In a relational data model the columns of a table are called _____.
2. Cardinality is the number of _____ in a relation.
3. Candidate key is a _____ key.
4. _____ model represent way of storing data in database.
5. Assertion is a _____
6. Two anomalies of Database Design are _____, _____
7. _____ level describes how data are actually stored.

Q.2 (a) Draw diagram of Database Architecture showing all components of database system and connections between all the components. **07**

(b) Why data model is necessary? Discuss Relational, Network and Object Oriented Data model. **07**

OR

(b) Discuss various benefits of Database System in detail. **07**

Q.3 (a) Draw ERD for the given case and convert it into relations. **07**

Election commission system wants to computerize election related activities. Every city has number of booths where people will vote. Every booth will have data of people who registered for that area. Every booth will have number of voluntaries (who can be supervisor or assistant) assigned to have smooth functioning of activities. Every voter has to give vote (only once) through voting machine in their area where booth is available. System will find out boothing details citywise and boothwise. The details of total number of votes per candidate should be stored.

State any assumptions (if any)

Assume appropriate attributes for each of the entities you mentioned in ERD.

(b) Discuss the concept of Aggregation in detail. **07**

OR

Q.3 (a) Attempt the following questions **07**

1. Discuss strong and weak entity by giving example.
2. Differentiate between stored and derived attribute
3. What do you mean by Data Independence? Discuss the concept of physical and logical data independence.

(b) Discuss the constraints on Generalization giving example. **07**

Q.4 (a) Why do we require normalization? Discuss 1NF, 2NF and 3NF showing Functional dependency with suitable example. **07**

(b) Discuss the concept of Data Dictionary in detail. **07**

OR

Q.4 (a) Attempt the following **07**

1. Discuss concept of BCNF giving example.
2. Discuss the concept of canonical cover.

(b) From the given FD, find candidate key for the same. **07**

$R = (A, B, C, D, E)$

FD : $AB \rightarrow C$, $CD \rightarrow E$ and $DE \rightarrow B$

Q.5 (a) Compute closure $\{X, Y\}^+$ of set of attributes $\{X, Y\}$ under FD **07**

$x \rightarrow yz$

$p \rightarrow zq$

$y \rightarrow p$

$za \rightarrow pq$

(b) Differentiate between Functional Dependency and Multivalued Dependency. **07**

OR

Q.5 (a) $R = \{A, B, C, D\}$ **07**

FD : $A \rightarrow B$, $B \rightarrow C$ and $AB \rightarrow D$

Show that decomposition $R_1(A, C)$, $R_2(A, B)$, $R_3(C, D)$ is not Dependency preservice.

(b) What is the need for Armstrong rules? Discuss any seven Armstrong rules. **07**
