

DiplETE – CS

Time: 3 Hours

DECEMBER 2014

Max. Marks: 100

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 Choose the correct or the best alternative in the following: (2×10)

a. Which one is the lowest level of data model?

- (A) physical data model (B) logical data model
(C) external data model (D) none of these

b. An abstraction concept for building composite objects from their component object is called

- (A) specialization (B) normalization
(C) generalization (D) aggregation

c. Which one of the following is not a valid aggregation function in SQL?

- (A) avg (B) min
(C) where (D) sum

d. Which of the following is not a valid operation in the relational algebra?

- (A) select (B) min
(C) project (D) rename

e. 4NF is designed to cope with

- (A) transitive dependency (B) join dependency
(C) multi valued dependency (D) none of these

- f. An alias is
- (A) An alternate name given to a relation
 (B) An alternate name given to an inner query
 (C) An alternate name given to a user
 (D) None of these
- g. _____ data type can store unstructured data
- (A) RAW (B) VARCHAR
 (C) CHAR (D) NUMERIC
- h. A table joined with itself is called _____
- (A) Equi join (B) Self join
 (C) Outer join (D) Join
- i. To delete a particular column in a relation the command used is:
- (A) UPDATE (B) DROP
 (C) ALTER (D) DELETE
- j. A schema describes
- (A) record relationship (B) data elements
 (C) record and files (D) all of these

**Answer any FIVE Questions out of EIGHT Questions.
 Each question carries 16 marks.**

- Q.2** a. What is a database? Describe the advantages and disadvantages of using DBMS over file system. (8)
- b. Using a suitable example show how an E-R model construct can be mapped to a relational model. (8)
- Q.3** a. Illustrate and explain the main phases of database design. (8)
- b. What are Weak entity types? Explain with the help of examples. (8)
- Q.4** a. What do you mean by integrity constraints? Explain the two integrity constraints, check and foreign key in SQL, with an example for each. Give the syntax. (8)
- b. Explain the operation of a two-tier client/server architecture for DBMS. (8)

- Q.5** a. Describe Entity integrity and Referential integrity. Give an example for both. (4)
b. Define Relational Algebra. Discuss traditional set operations on relations. (8)
c. Explain the difference between 1NF and 2NF. (4)
- Q.6** a. What do you mean by indexing? What are the different types of indexing? (8)
b. What is hash file organization? What are the causes of bucket overflow in a hash file organization? What can be done to reduce the occurrence of bucket overflow? (8)
- Q.7** a. Define Armsrong's axioms. Why are these called sound and complete? (8)
b. Differentiate between the following: (8)
(i) Theta Join
(ii) Equi Join
(iii) Natural Join
(iv) Outer Join
- Q.8** a. What are the differences between Functional, Multivalued and Join dependencies? Give examples. (8)
b. What are the basic data types available for attributes in SQL? (4)
c. Define join dependencies and fifth normal form. (4)
- Q.9** a. Explain cost based query optimization. What are the cost components for Query Execution? (8)
b. Explain how Aggregate Operations and Outer Joins are implemented. (8)