

Code: AC14/AT11 Subject: DATABASE MANAGEMENT SYSTEMS

AMIETE – CS/IT (OLD SCHEME)

Time: 3 Hours

OCTOBER 2012

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 schema describes

(A) Record Relationship	(B) Data Elements
(C) Record and files	(D) All of the above
- An abstraction concept for building composite objects from their component object is called _____.

(A) specialization	(B) normalization
(C) generalization	(D) aggregation
- Which of the following is not a valid aggregation function in SQL?

(A) avg	(B) min
(C) where	(D) sum
- Which of the following is not a valid operation in the relational algebra?

(A) select	(B) min
(C) project	(D) rename
- 4NF is designed to cope with

(A) transitive dependency	(B) join dependency
(C) multi valued dependency	(D) none of these
- Which one is lowest level data model?

(A) physical data model	(B) logical data model
(C) external data model	(D) None of the above
- 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 the above

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- h. _____ data type can store unstructured data
- (A) RAW (B) VARCHAR
(C) CHAR (D) NUMERIC
- i. A table joined with itself is called _____
- (A) Equi join (B) Self join
(C) Outer join (D) Join
- j. To delete a particular column in a relation, the command used is:
- (A) UPDATE (B) DROP
(C) ALTER (D) DELETE

**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. (6)
- b. Discuss the correspondence between the E-R model construct and the relation model construct. Show by using a suitable example how each E-R model construct can be mapped to the relational model? (10)
- Q.3.** a. Consider the following relational schema:
Doctor(DName, Reg_no) Patient(Pname, Disease), Assigned_To (Pname, Dname)
For each of the following queries, give expression in both Tuple calculus and Domain calculus:
(i) Get the names of patients who are assigned to more than one doctor.
(ii) Get the names of doctors who are treating patients with 'Polio'. (10)
- b. Consider the following relational schema:
PERSON (SS#, NAME, ADDRESS);
CAR (REGISTRATION_NUMBER, YEAR, MODEL); ACCIDENT (DATE, DRIVER, CAR_REG_NO); OWNS (SS#, LICENSE)
Construct the following relational algebra queries:
(i) Find the names of persons who are involved in an accident.
(ii) Find the registration number of cars which were not involved in any accident. (6)
- Q.4** a. What do you mean by integrity constraints? Explain 'Check constraint' and 'Foreign key constraint' in SQL with an example for each. Give the syntax. (8)
- b. Differentiate between DDL and DML by giving suitable examples. (4)
- c. Explain WHERE and HAVING clause in SQL. Give suitable example. (4)

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Q.5 a. Describe entity integrity and referential integrity. Give an example of each. (6)

b. Consider the two relations given below

R		
A	B	C
1	b1	c1
Null a1	b2 b1	null c1

S		
D	A	F
d1	a1	f1
d1	a2	nulll

Given that A is the primary key of R, D is the primary key of S and there is a referential integrity between S.A and R.A, discuss all integrity constraints that are violated. (6)

c. Difference between 1NF and 2NF. (4)

Q.6 a. What is the main goal of RAID technology? Describe RAID levels 1 through 5. (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. Discuss the importance of sorting in a query processing. (6)

b. Differentiate between the following using a suitable example.
 (i) Theta Join (ii) Equi Join
 (iii) Natural Join (iv) Outer Join (10)

Q.8 a. What are the ACID properties in DBMS? Explain each property in detail. (8)

b. Define the following terms:
 (i) Primary key (ii) Super key
 (iii) Multivalued attribute (iv) Relationship instance (8)

Q.9 a. Why is concurrency control needed? Discuss Timestamp - ordering protocol for concurrency control. (8)

b. Write short notes on:
 (i) Shadow Paging
 (ii) Deadlock Handling (4+4)