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Paper Code : BCA-401

DATABASE MANAGEMENT SYSTEMS

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

i) If a set of attributes K, in a relation to schema R1 is a foreign key to R1 then

a) every tuple of R1 has a distinct value for K

b) K is key for some other relation

c) K cannot have a null value for tuples in R1

d) K is a primary key for R1.

ii) Which of the following features is supported in relational database model ?

a) Complex data types

b) Multi-valued attributes

c) Associations with multiplicities

d) Generalization relationships.

iii) SQL is a

a) Procedural Language

b) Non-procedural Language

c) Complex Language

d) None of these.

iv) The entity integrity constraint states

a) No primary key value can be null

b) A part of the key may be null

c) Duplicate object values are allowed

d) None of these.

v) What is the default format of date in Oracle ?

a) dd-mm-yy b) dd-m-yyyy

c) dd-mon-yy d) none of these.

vi) Which of the following aggregate functions works with characters ?

a) Max b) Avg

c) Count d) None of these.

vii) If we do not specify the constraint name for a constraint, the default name is in the format

a) SYS_Cn b) Cn_SYS

c) Cn d) None of these.

viii) The information about data in a database is called

a) Tera data b) Meta data

c) Hyper data d) None of these.

ix) Which data abstraction level specifies how data are stored in database ?

a) Physical b) Logical

c) View d) None of these.

x) In transaction, a WRITE operation will

a) read data from table and write on buffer

b) write on table

c) depend on application

d) lock a data for updating.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following 3 × 5 = 15

2. Tables :

Student

Roll(PK)	Name	Dept id (FK)
1	ABC	1
2	DEF	1
3	GHI	2
4	JKL	3

Department

Dept id (PK)	Dept_Name
1	A
2	B
3	C

What will happen if we try to excute the following two SQL statements ?

Give proper explanation for your answer.

a) Update Student set Dept id = Null where Roll no = 1;

b) Update Department set Dept id = Null where Dept id = 1 ;

3. Let R (a,b,c) and S (d,e,f) be two relations in which d is the FK of S that referes to the primary key of R. Which of the following is true about the Referential integrity constraint ? Give proper explanation for your answer for choosing or not choosing each of the option.

a) Insert into R b) Insert into S c) Delete from R

d) Delete from S.

4. Let E1 and E2 be two entities in an E-R diagram with simple valued attributes. R1 and R2 are two relations between E1 and E2, where R1 is one-to-many and R2 is many-to-many. R1 and R2 do not have any attributes of their own. What is the minimum number of tables required to represent the situation in the relational model ? Give proper explanation for your answer.

5. 'All primary keys are super key but the converse is not true'. Explain with example.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

6. a) Construct an E-R diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted. 8

   b) What is Metadata ? Explain with the help of a example. 3

   c) Differentiate between Delete and Truncate operations. 4

7. Consider the following schemas :

   Employee_master (EmpNo, Name, Job, Hiredate, Salary, manager_id, Dept_no, Age, E_sal)

   Perform the following queries on table (write appropriate SQL statement) (any *five*) 5 × 3

   a) List all employees' names and jobs whose job includes 'M' or 'P'.

   b) List all employees' names and their salaries whose salary lies between 15000 and 35000. (using between clause)

c) List all employees' names, salaries and 25% raise in salary.

d) Find how much amount the company is spending towards salary head.

e) List all employees' names and their manager_id whose manager_id is 7902, 7566 or 7789.

f) List the difference between minimum and maximum salaries of employees.

8. What is functional dependency ? Explain with example. Define 1NF, 2nd NF, 3rd NF and BCNF with example.

3 + 4 + 8

9. a) Write and explain GROUP BY, LIKE, DISTINCT, INNER JOIN and UPDATE commands in SQL. Also give one example for each.

b) Explain ACID properties. 10 + 5

10. Write short notes on any *three* of the following :

3 × 5

a) Multi-level index ?

b) Logical data independence and physical data independence

c) Codd's rule

d) The three-level architecture of DBMS

e) Query optimization.