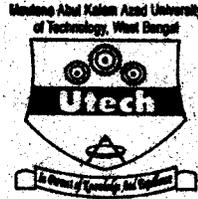


**CS/BCA/EVEN/SEM-4/BCA-401/2015-16**



**MAULANA ABUL KALAM AZAD UNIVERSITY OF  
TECHNOLOGY, WEST BENGAL**

**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 × 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.

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- 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.

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- 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

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What will happen if we try to execute 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 refers 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.  $3 \times 15 = 45$

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)

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- 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, 2<sup>nd</sup> NF, 3<sup>rd</sup> 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 x 5

- a) Multi-level index ?
- b) Logical data independence and physical data independence

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- c) Codd's rule
  - d) The three-level architecture of DBMS
  - e) Query optimization.
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