	Uiteah
Name:	
Roll No.:	A grant of Exemplify and Exempl
Invigilator's Signature :	

DATABASE MANAGEMENT SYSTEM

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)

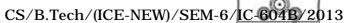
- 1. Choose the correct alternatives for any ten of the following : $10 \times 1 = 10$
 - i) The entity integrity constraint states that
 - a) no primary key value can be null
 - b) a part of the key may be null
 - c) duplicate object values are allowed
 - d) none of these.
 - ii) In a relational data model, the columns of a table are called
 - a) relation
- b) tuple

c) degree

d) attribute.

6477 Turn over

D. 16	5. Tech/ (ICE-NEW)/ SEM-0/IC-004B/ 2013					
iii)	BC	NF is in		ORGAN		
	a)	1NF	b)	2NF		
	c)	3NF	d)	4NF.		
iv)	Overall logical structure of a database can be expressed					
	graphically by					
	a)	ER diagram	b)	Records		
	c)	Relations	d)	Hierarchy.		
v)	What is the cardinality of a table with 100 rows and					
	10 columns ?					
	a)	1000	b)	100		
	c)	10	d)	None of these.		
vi)	A ta	able can have only one				
	a)	candidate key	b)	primary key		
	c)	alternate key	d)	super key.		
vii)	DD	L stands for				
	a) Data dictionary language					
	b) Data defined language					
	c) Dictionary definition language					
	d) Data definition language.					



viii) A person who has central control over the database system is called

a) Data selector

b) Data analyst

- c) Database administrator
- d) Database user.
- ix) The operation of a certain relation X, produces Y such that Y contains only selected attributes of X. Such an operation is called
 - a) Selection b) Union
 - c) Projection d) Set difference.
- x) View is a
 - a) Virtual table b) Dynamic table
 - c) Permanent table d) Temporary table.
- xi) Which of the following is not a DDL statement?
 - a) Drop b) Create
 - c) Select d) Alter.

- xii) Serializability of concurrent transactions is ensured b
 - a) Locking and unlocking
 - b) Time-stamping
 - c) both of these
 - d) none of these.

GROUP - B (Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

- Describe three-schema architecture of DBMS. Define
 Physical Data Independence and Logical Data
 Independence.
- 3. Define Super key, Candidate key, Primary Key, Foreign key and Alternate key.
- 4. What is the difference between Database and Table ? What are the roles of a Database Administrator ? 2 + 3
- 5. What is deadlock prevention? Explain wait-die and wouldwait protocols for deadlock prevention. 2+3
- 6. Describe the concept of generalization and specialization in the context of ER diagram.

6477 4

GROUP - C (Long Answer Type Questions)

Answer any three of the following. $3 \times 15 = 4$

7. Consider the following relational schema, where the primary keys are underlined.

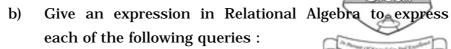
```
employee ( <u>person_name</u>, street, city )

works ( <u>person_name</u>, company_name, salary )

company ( <u>person_name</u>, city )

manager ( <u>person_name</u>, manager_name )
```

- a) Give an expression in SQL to express each of the following queries :
 - i) Find the names of all employees who live in the same city and on the same street as do their managers.
 - ii) Find the names of all employees in this database who live in the same city as the company for which they work.
 - iii) Give all employees of First Bank Corporation a10 per cent salary raise.



- Find the names, street address and cities of residence of all employees who work for First Bank Corporation.
- ii) Delete all tuples in the works relation for employees of Small Bank Corporation.
- iii) Find the names of all employees who earn more than every employee of Small Bank Corporation.

$$\left(2\frac{1}{2}+2\frac{1}{2}+2\frac{1}{2}\right)+\left(2\frac{1}{2}+2\frac{1}{2}+2\frac{1}{2}\right)$$

- 8. a) Write down the difference between traditional file processing and DBMS.
 - b) Describe ACID properties of transactions.
 - c) Give an example of derived attribute.
 - d) Explain the difference between weak entity set and strong entity set. 4 + 5 + 2 + 4
- 9. a) Discuss insertion anomalies with an example. Suggest a method to overcome from it.
 - b) Give a relational schema supply (sno, city, status, pno, qty) with FD set

 $F = \{ \text{ sno} \rightarrow \text{city, city} \rightarrow \text{status, } \{ \text{ sno, pno} \} \rightarrow \text{qty} \}$ Find the key of the schema.

Also reduce it into 3NF.

- c) Define MVD with suitable example.
- d) Explain partial dependency and transitive dependency with examples. 3 + 6 + 3 + 3

6477



- 10. a) Explain two-phase locking protocol.
 - b) Consider the following two transactions:

T1: Read(A)

Read(B)

If A = 0 then B = B + 1

Write(B)

T2: Read(B)

Read(A)

If B = 0 then A = A + 1

Write(A)

Add lock and unlock instructions to transactions T1 and T2, so that they observe the two-phase locking protocol. Can the execution of these transactions result in a deadlock?

- c) Briefly explain serial schedule and serializable schedule with suitable example. 4 + 6 + 5
- 11. Write short notes on any three of the following:

 3×5

- a) Deferred Database modification
- b) B-tree organization
- c) Define view and state its advantages and limitations
- d) Query optimization technique
- e) DBMS architecture.