



FACULTY OF ENGINEERING
University of Rajshahi

Section	A	B
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Additional Script

Official Seal

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Course Code

Date of Exam

Signature of Invigilator

Ans. to the ques. No. - 07

8

Here $R(A, B, C)$

$$F = \{ A \rightarrow BC \\ B \rightarrow C \\ A \rightarrow B \\ AB \rightarrow C \}$$

1. Union of, duplicate left hand side

$$F = \{ A \rightarrow BC \\ B \rightarrow C \\ AB \rightarrow C \}$$

2. If 'B' is extraneous in $A \rightarrow BC$

$$F' = \{ A \rightarrow C, B \rightarrow C, AB \rightarrow C \}$$

$A^+ = \{ AC \}$; B is not extraneous.

If 'C' is extraneous in $A \rightarrow BC$

$$F' = \{ A \rightarrow B, B \rightarrow C, AB \rightarrow C \}$$

$A^+ = \{ ABC \}$: C is extraneous

Q A) Isolate the quantifiers (if any)

$$3. F^* = \{ A \rightarrow B \\ B \rightarrow C \\ AB \rightarrow C \}$$

Let's check if 'A' is extraneous in $AB \rightarrow C$
We use the F^* .

$B^+ = \{ BC \} ; A \text{ is not}$
if 'B' is extraneous in $AB \rightarrow C$.
 $A^+ = \{ ABC \} ; B \text{ is extraneous}$

$$\therefore F = \{ A \rightarrow B \\ B \rightarrow C \\ A \rightarrow C \}$$

Further removal of duplicate

$$F = \{ A \rightarrow BC \\ B \rightarrow C \}$$

Ans. to the ques. No- 02

Advantages of VIEW

- a. VIEWS are not stored in physical storage.
- b. Restrictions can be imposed on VIEW.
- c. Information can be hide using a VIEW
- d. Modifications are discarded as they are not stored in physical storage.

Disadvantages of VIEW

1. Drop of a table makes the view irrelevant of that table.
2. When views are created for a large table, it takes huge storage.

Ans. to the ques. No- 09

T₁

T₂

~~There is no concurrent execution schedule that can be serializable.~~

~~<T₁, T₂> or <T₂, T₁> both changes a or b. Thus if we execute any one of T₁ or T₂, the next will be failed~~

~~Transaction T₁~~
read(A)
read(B)
if A=0; B:=B+1

~~Transaction T₂~~
read B
~~read(A)~~

* This was written after exam time: *

There is no concurrent execution of T₁ and T₂ that produces a serializable schedule.

This is because, the last statement of one transaction is in conflict with the first statement of another transaction. So, they must be swapped.

Ans. to the ques. No-3

Advantages of RAID level 4

- This technique allows block level striping, which facilitates simultaneous I/O operation.
- It is a way of storage optimization.

Disadvantage of RAID level 4

- Failure in parity disk leads to the loss of data.
- Due to block parity, random write operation is slow.

Ans. to the ques. No - 05

$a \rightarrow b$ [basic rule] \Rightarrow augmentation
 $a \rightarrow g$ [trivial] \Rightarrow augmentation
2. $a \rightarrow ab$ [augmentation]
 $aa \rightarrow gb$ [$a \rightarrow g$] [trivial]
 $a \rightarrow bg$ [$a \rightarrow a$, trivial]

X

Ans. to the ques. Number - 01

Let the name of the database is db.

DBA:

GRANT ALL PRIVILEGES ON db.* TO 'U1'@'localhost';

U1:

GRANT INSERT ON db.X TO 'U2'@'localhost';

GRANT UPDATE ON db.Y TO 'U2'@'localhost';

GRANT GRANT OPTION on db.Y TO 'U2'@'localhost';

U2:

GRANT UPDATE ON db.Y TO 'U3'@'localhost';

Answer to the ques. Number - 04

Larger disk block size:

The advantage of having larger disk block size includes the processing and loading time will be less, this will really be helpfull to process task fast. While the disadvantage includes wastage of disk space.

Smaller disk block size:

The advantages of having smaller disk block size is that, it is efficient to use memory, as there will be less or no wastage of disk space. While the disadvantage includes the processing and loading time will be more. This will result in system slow down.

Answer to the ques No. 06

A trigger is a statement that the system executes automatically as a side effect of a modification to the database.

Example:

Let there be two tables in a database

employee (id, first_name, last_name, email)

recycle-bin (id, first_name, last_name, email) ^{from employee}

The trigger is defined as, deleting a row¹ will be automatically stored in recycle-bin.

```

MySQL: DELIMITER //
CREATE TRIGGER move_to_bin BEFORE DELETE ON employee
FOR EACH ROW
BEGIN
    INSERT INTO recycle-bin (id, first-name, last-name, email)
    VALUES (OLD.id, OLD.first-name, OLD.last-name, OLD.email)
END;
// 
DELIMITER ;

```

Ans. to the ques. Number - 08

Let $R = (A, B, C, D)$, $F = \{ A \rightarrow B, C \rightarrow D, B \rightarrow C \}$

BCNF decomposition

$R_1 = (A, B)$	$R_2 = (C, D)$	$R_3 = (A, D)$
$R_1 = (A, B)$	$R_2 = (C, D)$	$R_3 = (A, D)$
$R_1 = (A, B)$	$R_2 = (B, C)$	$R_3 = (A, C)$

Ans. to the ques. Number - 10

Tables are Renamed as Boys B and Girls G

$$r_1 = \pi_{course}(G) - \pi_{course}((\pi_{course}(G) \times \pi_{gid}(G)) - \pi_{course,gid}(G))$$

r_1 gives the courses taken by all girls.

$$\text{result} = B - ((\pi_{bid, course}(B) \times r_1) - \pi_{bid, course, course, age}^{(B)})$$