

21. Match the following with most appropriate type of attributes:

List - I

- (P) 1NF
(R) BCNF

- (Q) 2NF
(S) 3NF

List – II

1. Transitive dependencies
2. Partial Dependencies
3. Unique rows
4. Candidate keys

Codes:

- (a) P – 4, Q – 3, R – 2, S – 1
- (b) P – 4, Q – 2, R – 3, S – 1
- (c) P – 4, Q – 1, R – 2, S – 3
- (d) P – 3, Q – 2, R – 4, S – 1

Q) $2NF \rightarrow$

List - I

~~Some - Definitions~~

List - II

P) 1 NF

1. Transitive Dependency

Q) 2 NF

2. Partial Dependency

R) BCNF

3. Unique Rows

S) 3 NF

4. Candidate Key.

Set¹

(G) P \rightarrow 3

Q \rightarrow 2

R \rightarrow 4

S \rightarrow 1

For Question No. 22 there are two statements Assertion (a) and Reason (r).

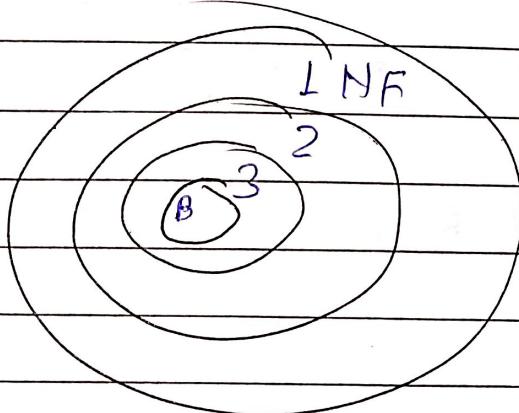
22. Assertion (A): Table with two attributes is in 3NF.

Reason (R): Table with two attributes is free from partial and transitive dependencies.

- (a) Both (a) and (r) are true and (r) is the correct reason for (a).
- (b) Both (a) and (r) are true and (r) is not the correct reason for (a).
- (c) Both (a) and (r) are false.
- (d) (a) is true but (r) is false.

- Q) 22 \Rightarrow (A) Table with two attributes is in 3NF
(R) Table with 2 attributes is free from P.D
 \Rightarrow T.D.

3 NF



- (a) Both True \Rightarrow (R) is correct reason
for (A)

Common data for Q23 & Q24.

Consider a relation with seven attributes ABCDEGH. You are given the following dependencies.

$$AB \rightarrow C, AC \rightarrow B, AD \rightarrow E, B \rightarrow D, BC \rightarrow A, E \rightarrow G$$

23. What is the key?

- (a) ACE
- (b) ACH
- (c) ACEH
- (d) It cannot be identified

24. Based on the key identified in Q23, what is the normal form that this table best satisfies?
- (a) 2 NF
 - (b) 3 NF
 - (c) BCNF
 - (d) 1 NF

Common - 22 & 23

$R(ABCDEGH)$

$AB \rightarrow C, AC \rightarrow B, AD \rightarrow E, B \rightarrow D, BC \rightarrow A,$

$E \rightarrow G$

2151 (Q)

2153 (Q)

P.D

23

what is key \rightarrow

H is free

(b) ACH^+ = $ACHBDEG$

(c) $ACEH^+ =$

(b) ACH is c.R

24

Normal Form?

$E \rightarrow G \rightarrow P.D$

(d) LNF

25. Pick up the *incorrect* statements of the following:

P: 2NF (Normal form) deals with transitive dependencies.

Q: BCNF deals with candidate keys.

R: $X \rightarrow Y$ is allowed in 3NF, if X is a super key or Y is part of the key.

S: If table is empty, it never satisfy any Functional dependency.

T: 1NF alone is mandatory normal form, rest of them are optional.

U: If ER diagram is converted into tables, then these tables must be evaluated for 4NF and 5NF.

- (a) P, Q, U (b) Q, R, T
(c) P, S, U (d) R, S, U

- ~~(E) 25~~ ~~incorrect~~
- P: 2NF deals with T.D (~~x~~)
- Q: BCNF deals with C.I.C
- R: $X \rightarrow Y$ is allowed in 3NF, if ~~Y~~ is
Super key part of key
- S: If table is empty, it never satisfy any NF.
1NF is alone is mandatory NF rest of them are optional
- T: If ER diagram is converted into table then these table must be evaluated for 4NF & 5NF (~~x~~)
- ~~Q~~ \rightarrow P, S, U \rightarrow incorrect

Common Data for Q26 & Q27:

$R = ABCDEFG$, FDs = $BC \rightarrow E$, $A \rightarrow F$, $A \rightarrow G$
 $C \rightarrow D$, $F \rightarrow G$, $BCD \rightarrow A$.

26. What is the key for the above relation?

- (a) BC
- (b) BD
- (c) BCD
- (d) A

27. What are BCNF tables?

- (a) CD, AF, FG, BAE
- (b) CD, AF, FD, BCAE
- (c) CD, AF, FG, BCAEF
- (d) CD, AF, FG, BCAE

Common

26 & 27

$R(ABCDEF)$ FD \rightarrow BC \rightarrow E, A \rightarrow F, A \rightarrow G, C \rightarrow D, F \rightarrow G, BCD \rightarrow A.

P.D

(a) 2G \Rightarrow Key?

$BC^+ = \cancel{BCE} \quad BC^- = \cancel{BCDEAF}$
 $BCEDAFG (\checkmark)$

(a)

BC is CKMND

(d) 27) BCNF Table -

$BC \rightarrow E \rightarrow P-D$ (1NF)

So

(d) BP, AF, F, G, BC AE

→ BCNF

28. Relation R is decomposed using a set of functional dependencies F and relation S is decomposed using another set of functional dependencies G. One decomposition is definitely BCNF, the other is definitely 3NF, but it is not known which is which. To make guaranteed identification, which one of the following tests should be used on the decompositions? (Assume that the closures of F and G are available)

- (a) Dependency-preservation
- (b) Lossless-join
- (c) BCNF decomposition
- (d) 3NF decomposition

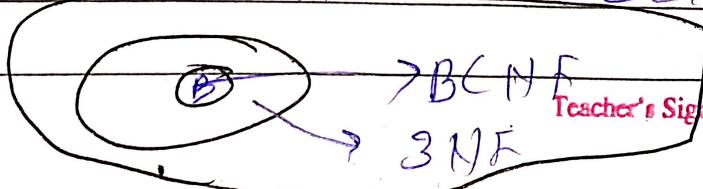
(c) 282) Relation R, $FD \rightarrow F$ $\rightarrow BCNF$
Relation S $FD \rightarrow G$ $\rightarrow 3NF$

$F \rightarrow G$ One available

- A) Dependency Preserving
- B) Lossless - Join
- C) BCNF \rightarrow others is also in 3NF
- D) 3NF

BCNF because — 3NF also in BCNF

But 3NF not in BCNF



Teacher's Signature

01. Logical unit of work is

- (a) transaction
- (b) block
- (c) record
- (d) bucket

(a) \rightarrow Logical unit of work is -

- (a) Transaction is a collection of operations that performs one logical unit of work.

02. In the following schedule transaction T_1 and T_2 are running concurrently. The execution of operation is given. Find which of the following problems it is suffering from.

T_1	T_2
Read A	
$A = A - 100$	
Read B	
	Read A
	Read B
	$A = A + 100$
	$B = B + 100$
	Write A
	Write B
$B = B + 100$	
Write A	
Write B	

(a) phantom phenomenon

(b) unrepeatable read

(c) uncommitted read

(d) lost update problem

(d) 2.8

T_1	T_2
$R(A)$	
$A = A - 100$	
$R(B)$	
	$R(A)$
	$R(B)$
	$A_f = 100$
	$B_f = 100$
<i>over write</i>	$w(A)$
	$w(B)$
$B_f = 100$	
$w(A)$	
$w(B)$	

$R(A)$

$R(B)$

$A_f = 100$

$B_f = 100$

$w(A)$

$w(B)$

$B_f = 100$

$w(A)$

$w(B)$

update of T_2 are
overwritten by

T_1

So -

Q. List & update
problem

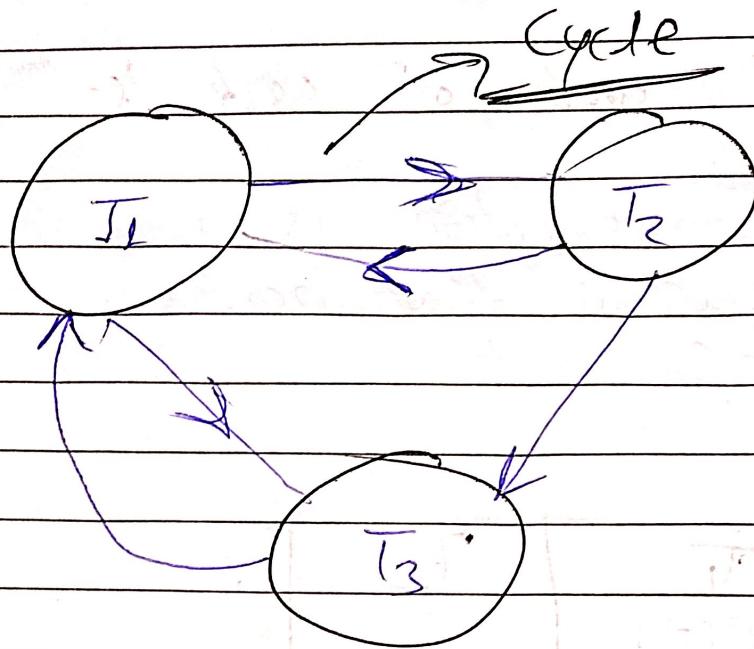
03. A schedule is having three transactions T_1 , T_2 , T_3 running concurrently with the following operations.

It is equivalent to the following serial scheduler.

T_1	T_2	T_3
Read y		
$y = y + 100$	Read z	
Write y	$z = z + 100$	Read x
	Write z	$x = x - 100$
		Write x
Read x		
$x = x + 100$	Read y	
Write x	$y = y - 100$	Read y z
	Write y	$z = z - 100$
Read z		Write z
$z = z + 100$	Read x	
Write z	$x = x + 300$	Read y
	Write x	$y = y + 500$
		Write y

- (a) $T_1 \rightarrow T_3 \rightarrow T_2$ (b) $T_3 \rightarrow T_2 \rightarrow T_1$
 (c) $T_1 \rightarrow T_2 \rightarrow T_3$ (d) None

(d) 33



Not conflict & parallelizability.

(d) 80

No order (

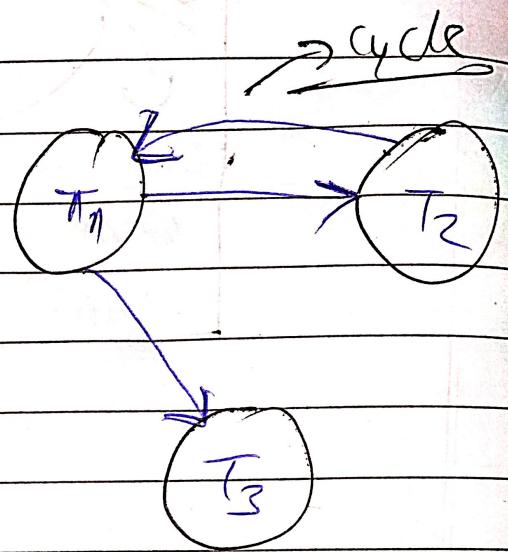
04. T_1 : Read A ; T_2 : Read B; T_2 : Write B;
 T_3 : Read A; T_3 : Write A; T_1 : Read B;
 T_3 : Read B; T_2 : Read A; T_2 : write A

The above schedule is

- (a) view serializable
- (b) conflict serializable
- (c) both
- (d) Can't serializable

④ ~~9.8~~

	T_1	T_2	T_3
$R(A)$			
$R(B)$			
$W(B)$			
	$R(A)$		
	$W(A)$		
$R(B)$			
	$R(A)$		
	$W(A)$		



No conflict
Serialization

No blind-write in Table \rightarrow So, Not View
Serializability

⑤

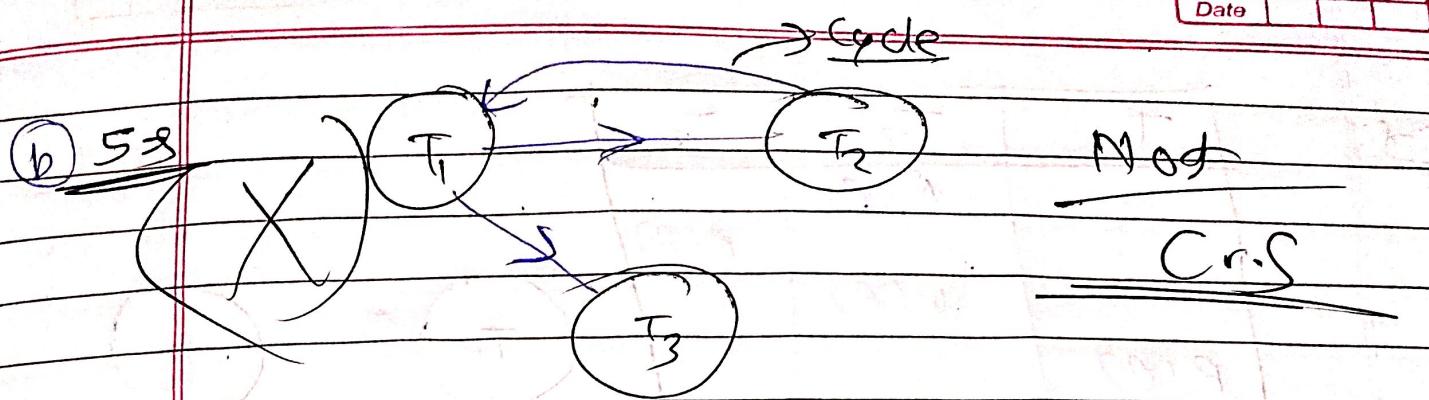
Can't Serialize

Teacher's Signature

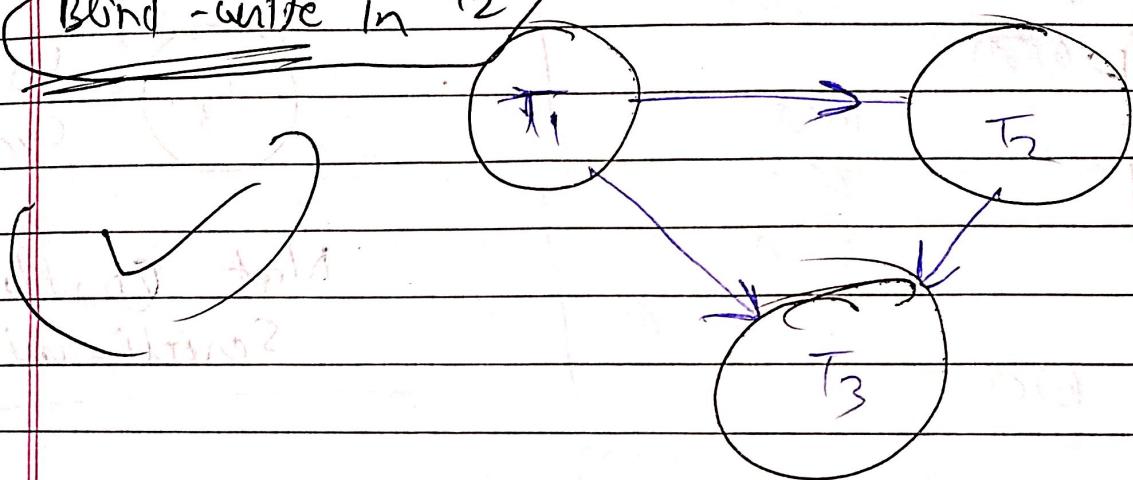
05. Is the below schedule can be serializable

T ₁	T ₂	T ₃
Read B		
		Read C
Read A		
	Write A	
Write A		
	Write B	
		Write A
Write B		
		Write B
		Write C

- (a) conflict serializable
- (b) view serializable
- (c) both
- (d) can't be serializable



Blind - write in T_2



View serializability

(b) View - Serializability orders

$T_L \rightarrow T_2 \rightarrow T_3$

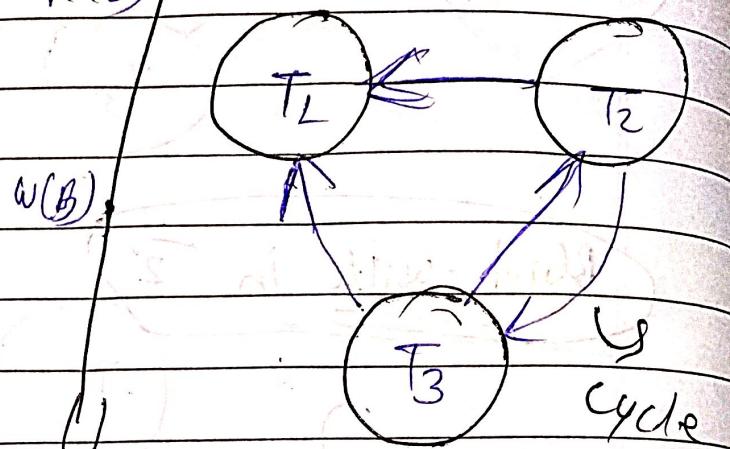
06. A schedule (S : T₂ : Read A; T₃: Read B;
T₂: Write A; T₁ : Read A; T₃ : Write B;
T₂: Read B; T₁ : Write A; T₂ : Write B;
T₂: Read C; T₂ : Write C; T₁ : Read C;
T₁: Write C; T₃: Write B)

Is the above schedule is serializable if yes it is
equivalent to which serial schedule

- (a) T₁: T₂ : T₃
- (b) It is not serializable
- (c) T₂ : T₁ : T₃
- (d) T₃: T₂ : T₁

b) 68

	T ₁	T ₂	T ₃
1.	R(A)		
2.		R(B)	
3.	W(A)		
4.	R(A)		
5.		W(B)	
6.	R(B)		
7.	W(A)		
8.		W(B)	
9.	R(C)		
10.	W(C)		
11.		R(C)	
12.		W(B)	



Not Conflict
Serializability

Not Blind Write in any Table,
So it is ~~not~~ ^{new} serializable

So -
It is not serializable.

07. A schedule $S : T_1 : \text{Read } A; T_2 : \text{Read } B; T_3 : \text{Read } C; T_3 : \text{Write } C; T_2 : \text{Write } B; T_1 : \text{Write } A$ is equivalent to which of the following serial schedule.

- (a) $T_1 : T_2 : T_3$
- (b) $T_2 : T_1 : T_3$
- (c) $T_3 : T_2 : T_1$
- (d) It is equivalent to all possible serial schedule with T_1, T_2, T_3

(d) ??

	T_1	T_2	T_3		T_1	T_2	T_3
	$R(A)$						
		$R(B)$					
			$R(C)$				
			$W(C)$				
		$W(B)$					
	$W(A)$						

connected
Not Kany table. ~~connected~~

(d)

It is equivalent to all possible serial schedule with T_1, T_2, T_3 .

08. T_1 , T_2 and T_3 are independent transaction and
are equal to all possible serial schedules.

The above schedule is _____ serializable

- (a) view
- (b) conflict
- (c) both
- (d) none

(c) (8)

Independent transaction always
satisfy serializability means
both C.S & V.S.