

1.

Given									
A	B	C	D	E	F	G	H	I	J
⊙	⊙	↑							
⊙			↑	↑					
	⊙				↑				
					⊙	↑	↑		
			⊙					↑	↑

1NF									
A	B	C	D	E	F	G	H	I	J
⊙	⊙	↑	↑	↑	↑	↑	↑	↑	↑
⊙			↑	↑				↑	↑
	⊙				↑	↑	↑		
					⊙	↑	↑		
			⊙					↑	↑

Key for R is {A, B}

2NF													
A	B	C		A	D	E	I	J		B	F	G	H
⊙	⊙	↑		⊙	↑	↑	↑	↑		⊙	↑	↑	↑
					⊙		↑	↑			⊙	↑	↑

3NF																	
A	B	C		A	D	E		B	F		F	G	H		D	I	J
⊙	⊙	↑		⊙	↑	↑		⊙	↑		⊙	↑	↑		⊙	↑	↑

2.

Given				
A	B	C	D	E
⊙	⊙	↑		
		⊙	⊙	↑
	↑		⊙	⊙

{A, B} is not a candidate key because it need {C, D} to relate to E
 {A, B, D} is a candidate key.

3.

Given (in 1NF)				
Car#	Date_ sold	Salespe rson#	Commi ssion%	Discount _amt
⊙	↑	⊙	(↑)	(↑)
	⊙			↑
		⊙	↑	

It's in 1NF because FD3 use partial key as it's key.

2NF						
Car#	Date_ sold	Salespe rson#	Discount _amt		Salespe rson#	Commi ssion%
⊙	↑	⊙	↑		⊙	↑
	⊙		↑			

3NF								
Car#	Date_ sold	Salespe rson#		Salespe rson#	Commi ssion%		Date_ sold	Discount _amt
⊙	↑	⊙		⊙	↑		⊙	↑

4.

a.

Given (2NF)			
A	B	C	D
↑		⊙	↑
(↑)	⊙	↑	(↑)

a. (a) Candidate key is {B}

a. (b) Best normal form is 2NF

a. (c)

BCNF					
B	C		C	A	D
⊙	↑		⊙	↑	↑

b.

Given (3NF)			
A	B	C	D
⊙	⊙	↑	↑
↑		⊙	
	↑		⊙

b. (a) Candidate key is {A, B}, {C, D}, {A, D}, {B, C}

b. (b) Best normal form is 3NF

b. (c)

BCNF										
A	C		B	C		A	D		B	D
↑	⊙		⊙	○		⊙	○		↑	⊙

5. No-Steal: Cache cannot be flushed before transaction commit.

Force: Cache is immediately flushed (forced) to disk.

此方式耐用性高，無須 undo 及 redo 的協助，但效能非常差。

(c)

