CS631: Tutorial questions for Functional Dependencies and Normalization

1- A relation *R* (A, B, C, D, E) with its extension. Which FDs may exist in this relation?

A	**B**	**C**	**D**	**E**
a	2	3	4	5
2	a	3	4	5
a	2	3	6	5
a	2	3	6	6

2- A relation STUDENT (SS#, NAME, MAJOR, COURSE, GRADE) with its instances. Which FDs may exist in this relation?

SS#	**NAME**	**MAJOR**	**COURSE**	**GRADE**
123	TOM	CIS	CIS 3500	A
123	TOM	CIS	CIS 4500	B
123	TOM	CIS	CIS 4300	A
200	AMY	FIN	ACC 2120	B
200	AMY	FIN	FIN 2000	B
200	AMY	FIN	CIS 2000	A
300	BILL	CIS	CIS 4300	A

3- What normal form is the LINE_ITEMS relation in?
LINE_ITEMS (PO_Number, ItemNum, PartNum, Description, Price, Qty)

PO_Number	ItemNum	PartNum	Description	Price	Qty
O101	I01	P99	Plate	$3.00	7
O101	I02	P98	Cup	$1.00	11
O101	I03	P77	Bowl	$2.00	6
O102	I01	P99	Plate	$3.00	5
O102	I02	P77	Bowl	$2.00	5
O103	I01	P33	Fork	$2.50	8

4- Normalize relation STOCKS to the highest normal form.

STOCKS (Company, Symbol, Headquarters, Date, Close_Price)

Company	Symbol	Headquarters	Date	Close Price
IBM	IBM	Armonk, NY	01/05/94	101.00
IBM	IBM	Armonk, NY	01/06/94	100.50
IBM	IBM	Armonk, NY	01/07/94	102.00
Netscape	NETS	Sunyvale, CA	01/05/94	33.00
Netscape	NETS	Sunyvale, CA	01/06/94	112.00
Microsoft	MSFT	Redmond, CA	01/05/94	101.00

5- Normalize the relation R to the highest normal form.

R(FundID, InvestmentType, Manager)

FundID	InvestmentType	Manager
99	Common Stock	Smith
99	Municipal Bonds	Jones
33	Common Stock	Green
22	Growth Stocks	Brown
11	Common Stock	Smith

FundID, InvestmentType → Manager
FundID, Manager → InvestmentType
Manager → InvestmentType