## Question 1

- 1)  $A \rightarrow B$  ? No:  $y \rightarrow x$  ;  $y \rightarrow z$
- 2)  $A \rightarrow C$  ? No:  $y \rightarrow z$  ;  $y \rightarrow w$ 4)  $D \rightarrow C$  ? No:  $y \rightarrow x$  ;  $y \rightarrow y$
- 6)  $D \rightarrow A$  ? No:  $y \rightarrow x$  :  $y \rightarrow z$

## Question 2

- (a) CLASS (CourseID, SectionID) 3NF
- (b) CLASS (CourseID, SectionID, Room) 3NF
- (c) CLASS (CourseID, SectionID, Room, Capacity) 2NF

Removing transitive dependency:

ROOM (Room, Capacity)

[new table]

CLASS (CourselD, SectionID, Room)

[what's left]

3NF

(d) CLASS (<u>CourseID</u>, <u>SectionID</u>, CourseName, Room, Capacity)

1NF

Removing partial-key dependency:

COURSE (<u>CourseID</u>, CourseName) [new table]

CLASS2 (<u>CourseID</u>, <u>SectionID</u>, Room, Capacity) [what's left] 2NF

Removing transitive dependency in CLASS2:

ROOM (Room, Capacity) [new table]

CLASS3 (CourseID, SectionID, Room) [what's left]

3NF

Question 3

(a) EmpID → EmpName, DeptID, DeptName (partial key dependency)

ProjectID → ProjectTitle (partial key dependency)

DeptID → DeptName (transitive dependency)

(b) Only in 1NF

(c) Removing partial key dependency:

EMP (EmpID, EmpName, DeptID, DeptName) [new table]

2NF

PROJECT (<u>ProjectID</u>, ProjectTitle) [new table]

3NF

ASSIGN (EmpID, ProjectID, ProjectHours) [what's left]

3NF

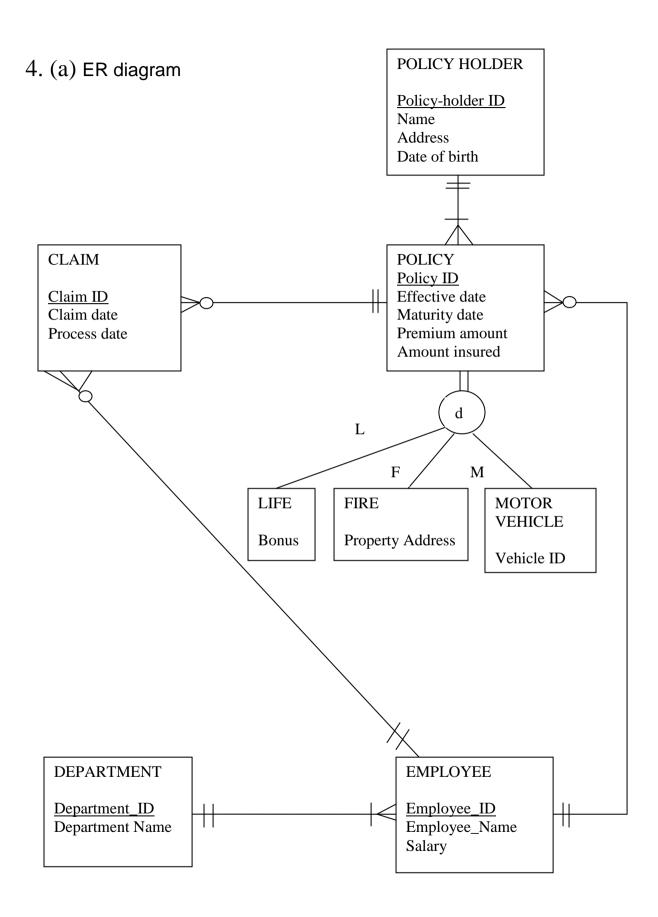
Removing transitive dependency:

DEPT (<u>DeptID</u>, DeptName) [new table]

3NF

EMP (EmpID, EmpName, DeptID) [what's left]

3NF



## 4. (b)

POLICY HOLDER (Policy-holder ID, Name, Address, Date of birth)

POLICY (<u>Policy ID</u>, Effective date, Maturity date, Premium amount, Amount insured, PolicyType, <u>Employee ID</u>,

Policy-holder ID)

LIFE (Policy ID, Bonus)

FIRE (Policy ID, Property Address)

MOTOR VEHICLE (Policy ID, Vehicle ID)

CLAIM (Claim ID, Policy ID, Employee ID, Claim date, Process date)

EMPLOYEE (Employee ID, Employee Name, Salary, Department ID)

DEPARTMENT (Department ID, Department Name)

All in 3NF, since they are free from partial-key dependency and transitive dependency.