Part 1 – Part 3 (20 marks per question):

ER Diagram [R1.1 – R1.3] (10 marks in total):
R1.1 All strong entities (boxes) should show attributes and identify the key by underlining the primary key attributes. If any, Weak Entities should be identified as such with a double bordered box, show the descriminator attributes and also show the relationship with a double bordered diamond. (3 marks)
R1.2 Relationships should be shown with a diamond shape, have a name and show relationship cardinalities in the proper way according to the Method 1, 2, and 3. (4 marks)
R1.3 Relationships must correctly show total vs. partial participation of entities in relationships. (3 marks)

ER mapped schema [2 marks per requirement R2.1 – R2.4] (8 marks in total):
R2.1 Their schema must correspond to their E-R diagram. Strong and weak entities each map to their own table (except if a table completely contains another which can happen if you have a chain of weak entities).
R2.2 All 1:1 and 1:N relationships are implemented by adding attributes to existing entity tables. All N:N relationships are implemented as their own tables.
If any, inheritance relationships are implemented by producing individual tables for the sub-class entities. (If necessary you may produce a table for the superclass entities as well.)
R2.3 Each table in your schema should have a name and clearly show all the attributes and have the attributes that make up the primary key underlined.
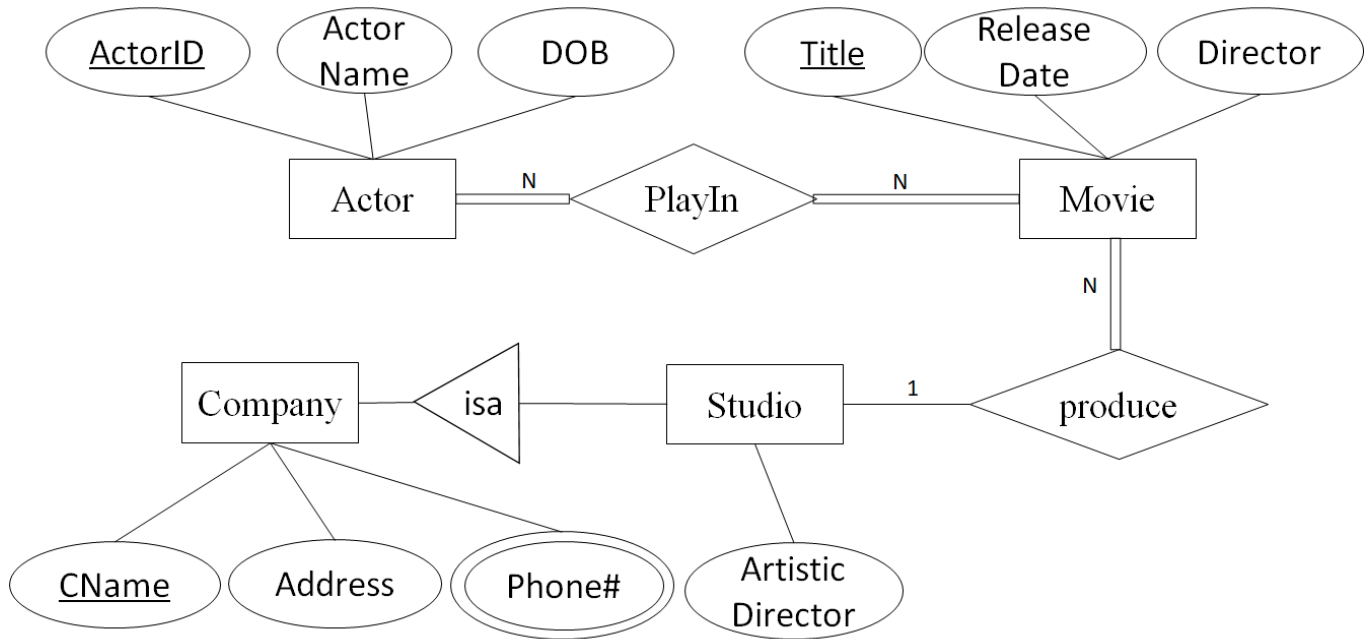R2.4 Each table should indicate any foreign key relationships with other tables. You can do this by drawing arrows on the schema if you want or using text.
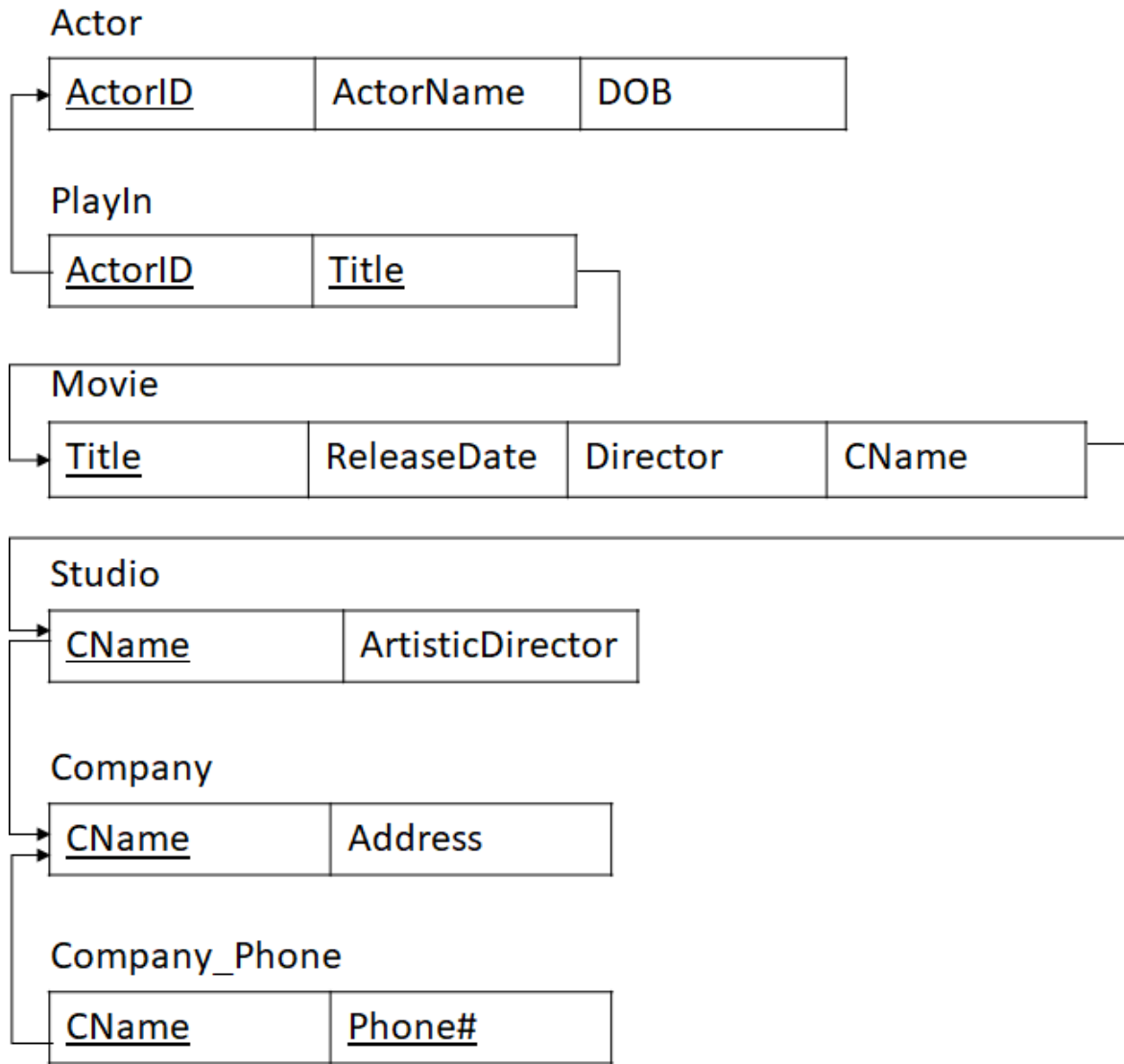
Constraints are not satisfied by SQL: 2 marks

Part 1:

Required constraints if other assumptions are not indicated:

1. Phone number is a multi-valued attribute.
2. Both movie and actor totally participate the relationship between them.
3. Studio partially participate the relationship with Movie.

Actor

ActorID	ActorName	DOB

PlayIn

ActorID	Title

Movie

Title	ReleaseDate	Director	CName

Studio

CName	ArtisticDirector

Company

CName	Address

Company_Phone

CName	Phone#

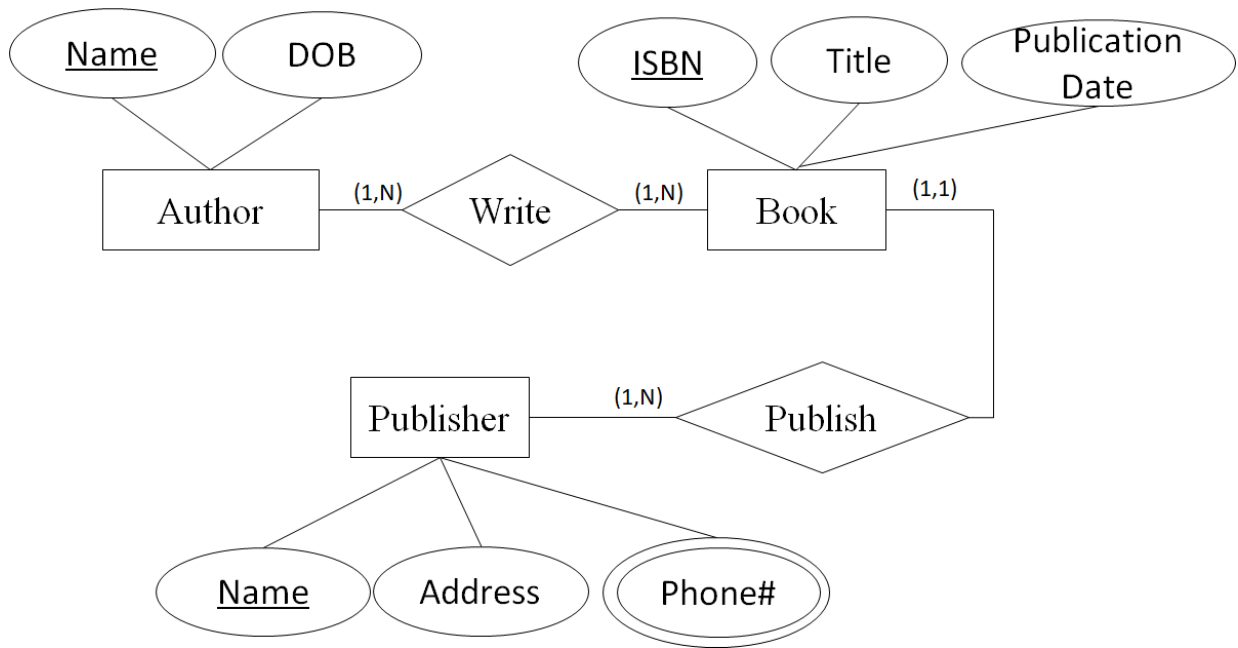Constraints are not satisfied by SQL:
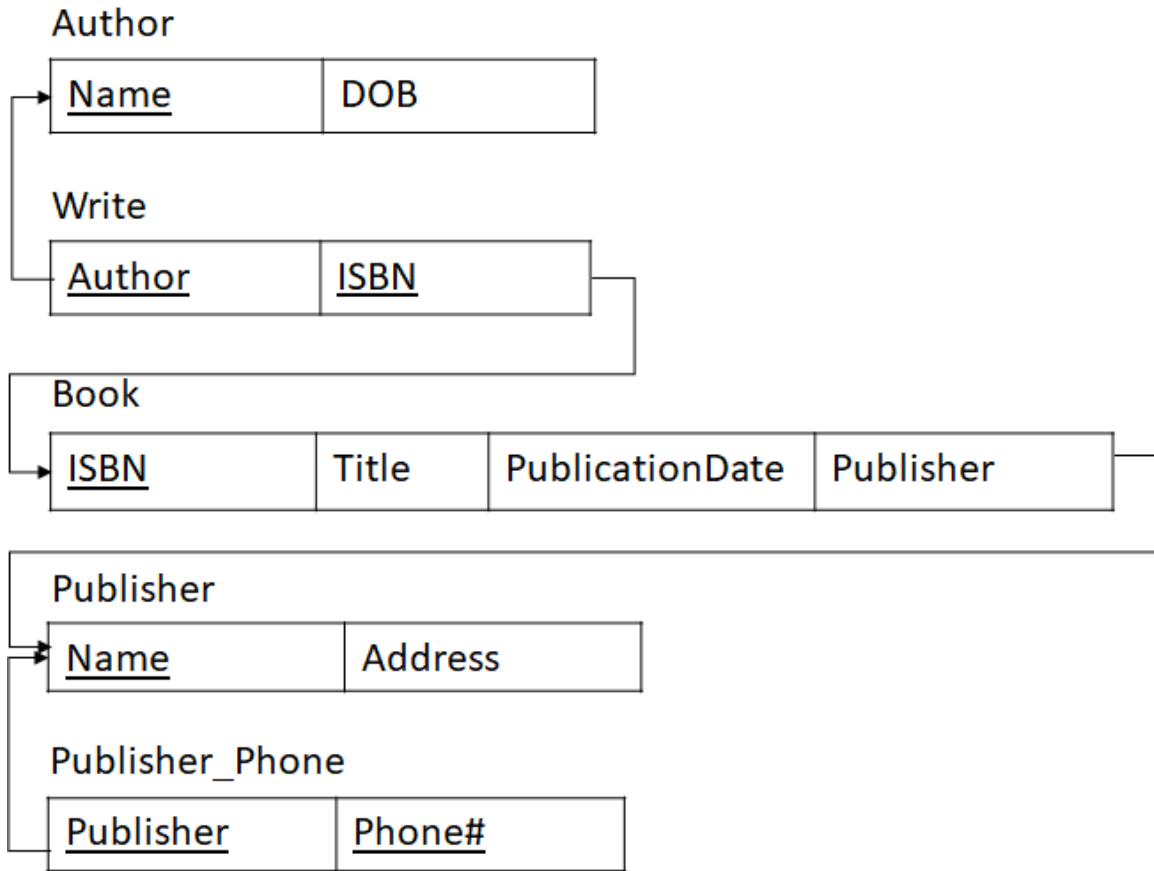(Based on the ER diagram, some total participation constraints may not be satisfied.)
Actor must act in Movie; Movie must have actors.

Part 2:

Required constraints if other assumptions are not indicated:

1. Phone number is a multi-valued attribute.
2. Author totally participate the relationship with Book.

Author

Name	DOB

Write

Author	ISBN

Book

ISBN	Title	PublicationDate	Publisher

Publisher

Name	Address

Publisher_Phone

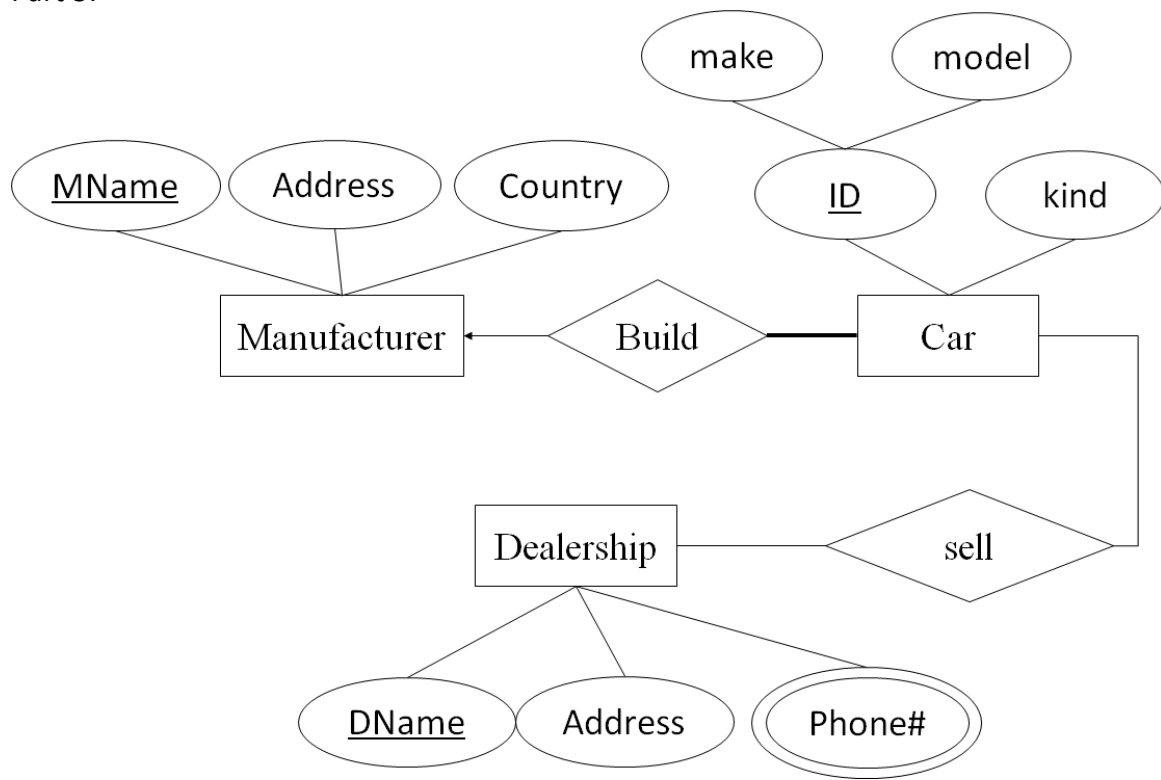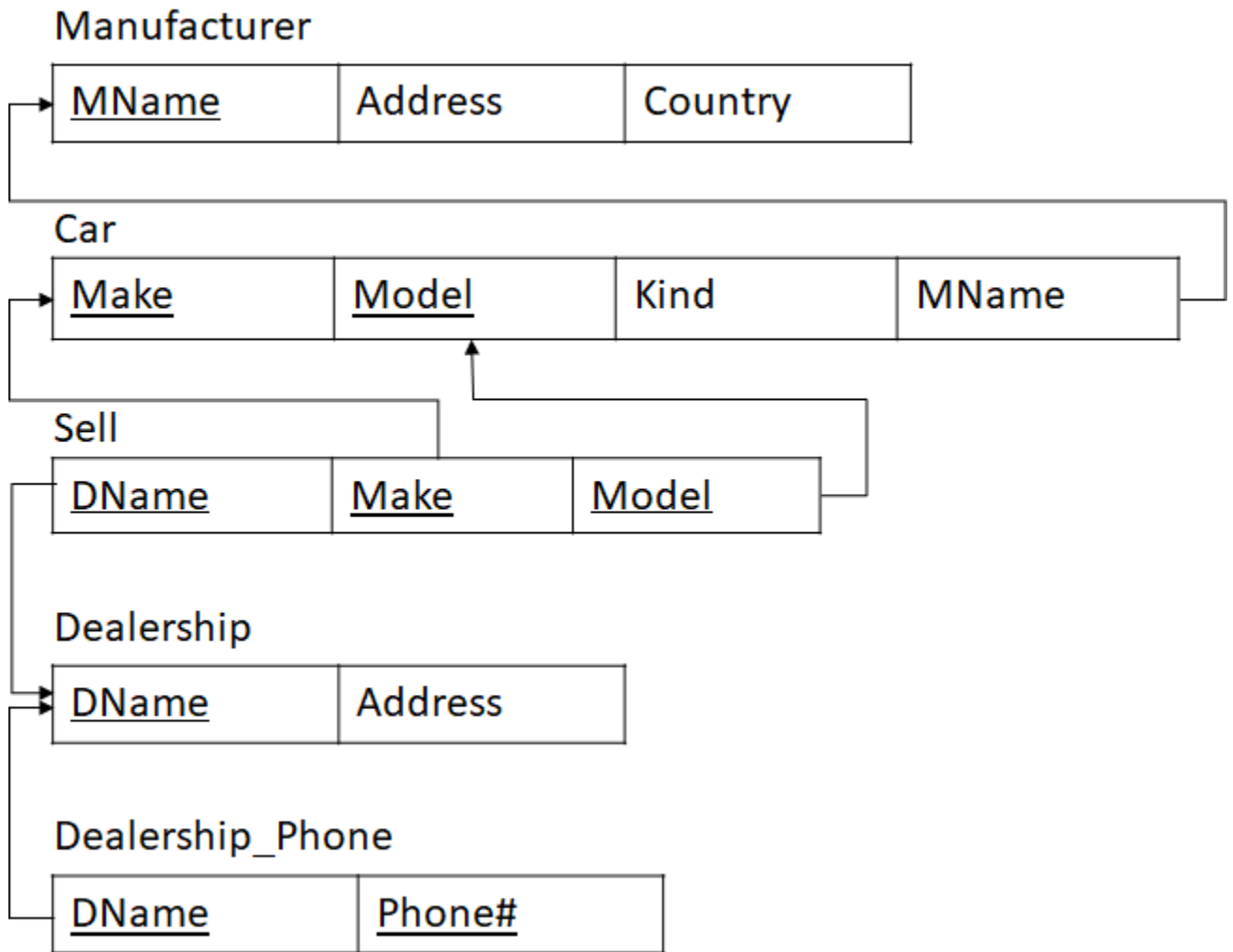| Publisher	Phone#

Constraints are not satisfied by SQL:
(Based on the ER diagram, some total participation constraints may not be satisfied.)
        An author must write books; a book must have an author; a publisher must publish books.

Part 3:

Manufacturer

MName	Address	Country

Car

Make	Model	Kind	MName

Sell

DName	Make	Model

Dealership

DName	Address

Dealership_Phone

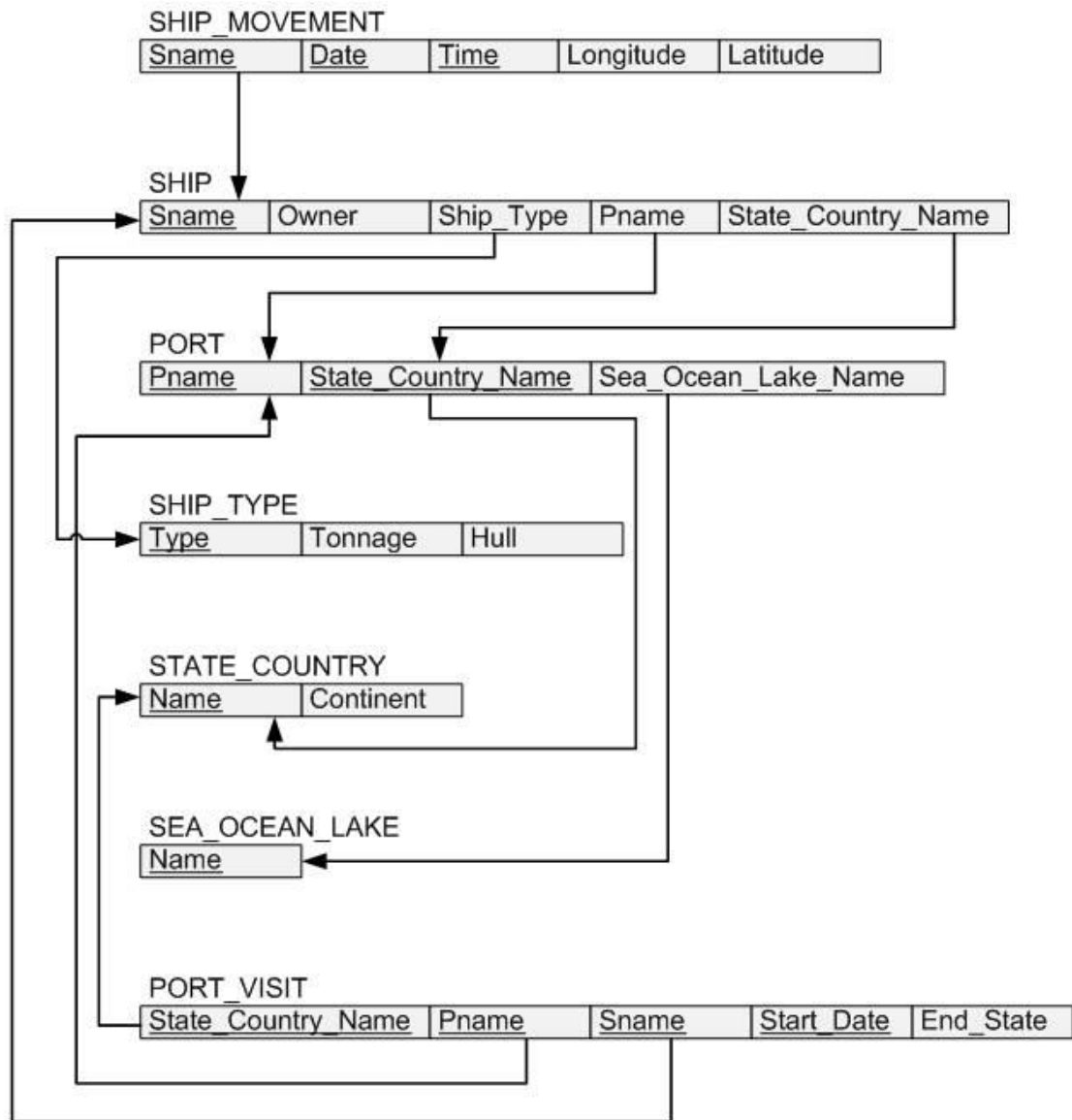| DName	Phone#

Constraints are not satisfied by SQL:

Based on the ER diagram, all constraints can be satisfied by SQL.

Part 4- Part 5 [20 marks per question]
5 marks per requirement R2.1 – R2.4

Part 4:

SHIP_MOVEMENT

| Sname | Date | Time | Longitude | Latitude |

SHIP

| Sname | Owner | Ship_Type | Pname | State_Country_Name |

PORT

| Pname | State_Country_Name | Sea_Ocean_Lake_Name |

SHIP_TYPE

| Type | Tonnage | Hull |

STATE_COUNTRY

| Name | Continent |

SEA_OCEAN_LAKE

| Name |

PORT_VISIT

| State_Country_Name | Pname | Sname | Start_Date | End_State |

Part 5: