

Name:- Ana Lopez

Id#:- _____

Part A:- Multiple Choice

[15 Points]

Circle the letter of the best choice.

1. In the context of the database design process, the conceptual design step that determines end-user views, outputs, and transaction-processing requirements is _____.
 a) data analysis and requirements
 b) entity relationship modeling and normalization
 c) data model verification
 d) distributed database design

2. The maintenance and evolution phase of the Database Life Cycle (DBLC) involves _____.
 a) Defining objectives
 b) introducing changes
 c) testing the database
 d) installing the DBMS

3. At the implementation level, the supertype and its subtype(s) depicted in a specialization hierarchy maintain a(n) ____ relationship.
 a) self-referencing
 b) 1:1
 c) 1:M
 d) M:N

4. A table that has all key attributes defined, has no repeating groups, and all its attributes are dependent on the primary key is said to be in _____.
 a) 1NF
 b) 2NF
 c) 3NF
 d) 4NF

5. Which query is used to list a unique value for V_CODE, where the list will produce only a list of those values that are different from one another?

a) SELECT ONLY V_CODE FROM PRODUCT;	b) SELECT UNIQUE V_CODE FROM PRODUCT;
c) SELECT DIFFERENT V_CODE FROM PRODUCT;	d) SELECT DISTINCT V_CODE FROM PRODUCT;

Name:- Ara Lopez

Id#:- _____

Use the Auto Table to answer questions 6 to 10.

ID	Make	Model	Type	Year	Price
1	Toyota	Camry	sedan	2015	9800
2	Ford	Escape	crossover	2015	15900
3	Honda	Civic	sedan	2016	10200
4	Volkswagen	Golf	compact	2014	8800
5	Toyota	RAV4	crossover	2016	12800
6	Toyota	4Runner	suv	2015	16900
7	Honda	CR-V	crossover	2016	17900

6. Choose the correct **SELECT statement** that returns the given result:- 2014

- a) SELECT MAX(YEAR) FROM Auto;
- b) SELECT MIN(PRICE) FROM Auto;
- c) SELECT MIN(YEAR) FROM Auto;
- d) SELECT AVG(PRICE) FROM Auto;

7. Choose the correct **SELECT statement** that returns the given result:- 2

- a) SELECT COUNT(*) FROM Auto;
- b) SELECT COUNT(*) FROM Auto WHERE PRICE > 10000;
- c) SELECT COUNT(*) FROM Auto WHERE PRICE < 10000;
- d) SELECT COUNT(*) FROM Auto WHERE PRICE BETWEEN 5000 AND 12000;

8. Choose the correct **SELECT statement** that returns the given result from the AUTO Table:-

Ford	1
Honda	2
Toyota	3
Volkswagen	1

- a) SELECT MAKE, COUNT(*) FROM Auto;
- b) SELECT MAKE, PRICE, COUNT(*) FROM AUTO
GROUP BY MAKE
ORDER BY MAKE;
- c) SELECT MAKE, COUNT(*) FROM AUTO
GROUP BY MAKE
ORDER BY MAKE;
- d) SELECT COUNT(*) FROM AUTO
GROUP BY MAKE
ORDER BY MAKE;

Name:- Ana Lopez

Id#:- _____

9. Choose the correct **SELECT** statement that returns the given result from the AUTO Table:-

2014	compact	8800
2015	crossover	15900
2015	suv	16900
2016	sedan	10200
2016	crossover	17900

- a) `SELECT YEAR, TYPE, MAX(PRICE) FROM AUTO
GROUP BY YEAR, TYPE, MAX(PRICE)
ORDER BY YEAR;`
- b) `SELECT YEAR, TYPE, MAX(PRICE) FROM AUTO
GROUP BY YEAR, TYPE
ORDER BY MAX(PRICE);`
- c) `SELECT YEAR, TYPE, MAX(PRICE) FROM AUTO
GROUP BY YEAR
ORDER BY YEAR, MAX(PRICE);`
- d) `SELECT YEAR, TYPE, MAX(PRICE) FROM AUTO
GROUP BY YEAR, TYPE
ORDER BY YEAR, MAX(PRICE);`

10. Choose the correct **SELECT** statement that returns the given result from the AUTO Table:-

2015	crossover	15900
2015	suv	16900
2016	crossover	17900

- a) `SELECT YEAR, TYPE, MAX(PRICE) FROM AUTO
GROUP BY YEAR
ORDER BY YEAR, MAX(PRICE);
HAVING MAX(PRICE) > 15000;`
- b) `SELECT YEAR, TYPE, PRICE FROM AUTO
GROUP BY YEAR, TYPE, MAX(PRICE)
ORDER BY YEAR;`
- c) `SELECT YEAR, TYPE, MAX(PRICE) FROM AUTO
GROUP BY YEAR, TYPE
HAVING MAX(PRICE) > 15000;
ORDER BY YEAR, MAX(PRICE);`
- d) `SELECT YEAR, TYPE, MAX(PRICE) FROM AUTO
GROUP BY YEAR, TYPE
ORDER BY YEAR, MAX(PRICE);`

Name:- _____

Id#:- _____

11. The syntax for a left outer join is _____.

- a) SELECT column-list
FROM table1 OUTER JOIN table2 LEFT
WHERE join-condition
- b) SELECT column-list
FROM table1 LEFT [OUTER] JOIN table2
ON join-condition
- c) SELECT column-list
WHERE LEFT table1 = table
- d) SELECT column-list
FROM table1 LEFT table2 [JOIN]
WHERE join-condition

12. How many rows would be returned from a cross join of tables A and B, if A contains 3 rows and B contains 5?

- a) 3
- b) 8
- c) 15
- d) 30

Refer to the **Department** table to answer questions 13-15.

Department

Code	Name	ManagerID
44	Engineering	2538
82	Sales	6381
12	Marketing	6381
99	Technical support	NULL

13. Which departments are deleted by:-

```
DELETE FROM Department
WHERE ManagerID = 6381;
```

- a) All departments
- b) Sales Only
- c) Marketing only
- d) Sales and Marketing

Name:- Ana Lopez

Id#:- _____

14. What is missing to delete only **Technical support**?

```
DELETE FROM Department  
WHERE _____;
```

- a) ManagerID = NULL
- b) Name = "Technical Support"
- c) Code = 99
- d) Code = 99 and ManagerID = NULL

15. What department managers are changed?

```
UPDATE Department  
SET ManagerID = 2538;
```

- a) All managers
- b) No managers
- c) Only the Engineering Manager
- d) Only the Technical Support Manager

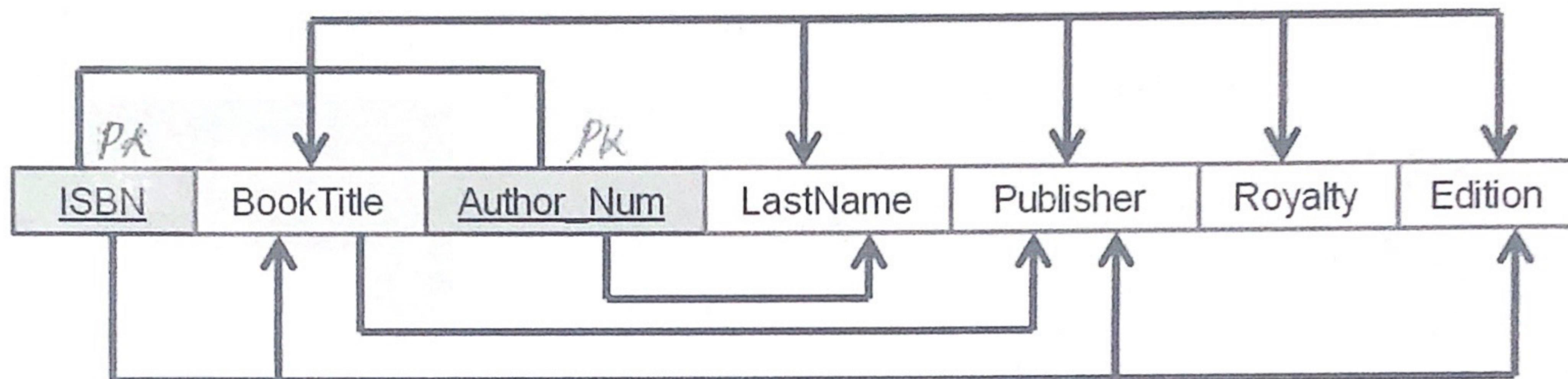
Name:- Ana Lopez

Id#:- _____

Part B:- Answer all 2 questions in spaces provided. Write all answers in spaces provided.Question 1:-

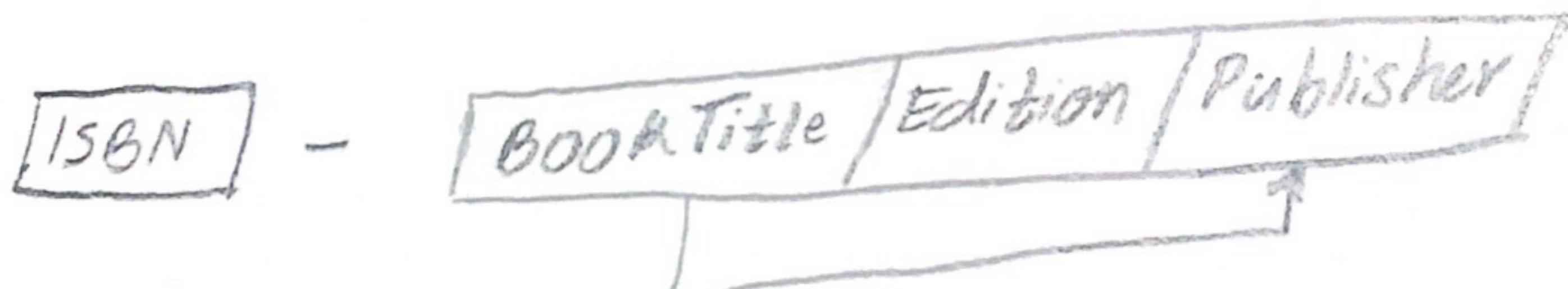
[30 Points]

The dependency diagram shown indicates that authors are paid royalties for each book that they write for a publisher. The amount of the royalty can vary by author, by book, and by edition of the book.



- a) Based on the dependency diagram, create a database whose tables are at least in 2NF, showing the dependency diagram for each table. [10 Points]

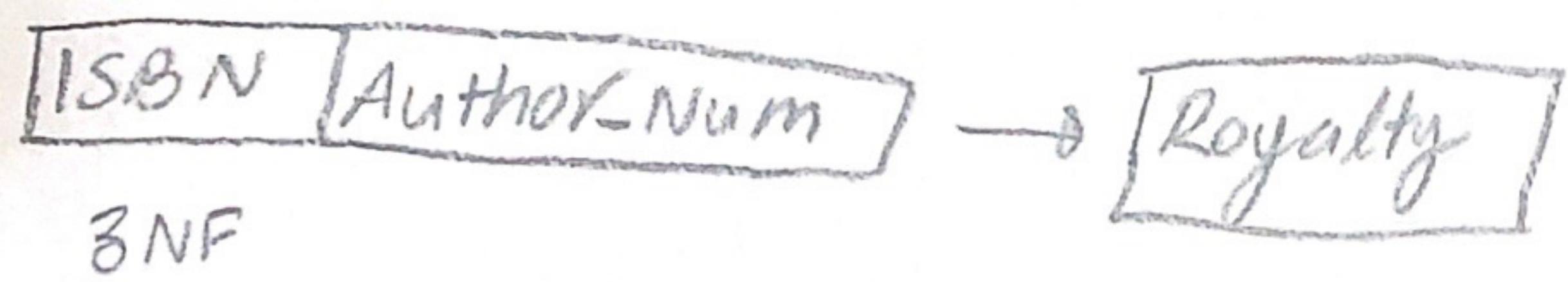
Primary keys: ISBN & Author_Num



Name:- Ana Lopez

Id#:- _____

- b) Remove all **partial and transitive dependencies**, write the relational schema, and draw the new dependency diagrams. Identify the normal forms for each table structure you created. Normalize upto 3NF. [20 Points]



- Removing BookTitle & Publisher due that they are different entity

Name:- Ara Lpez

Id#:- _____

c) Draw the Crow's Foot ERD.

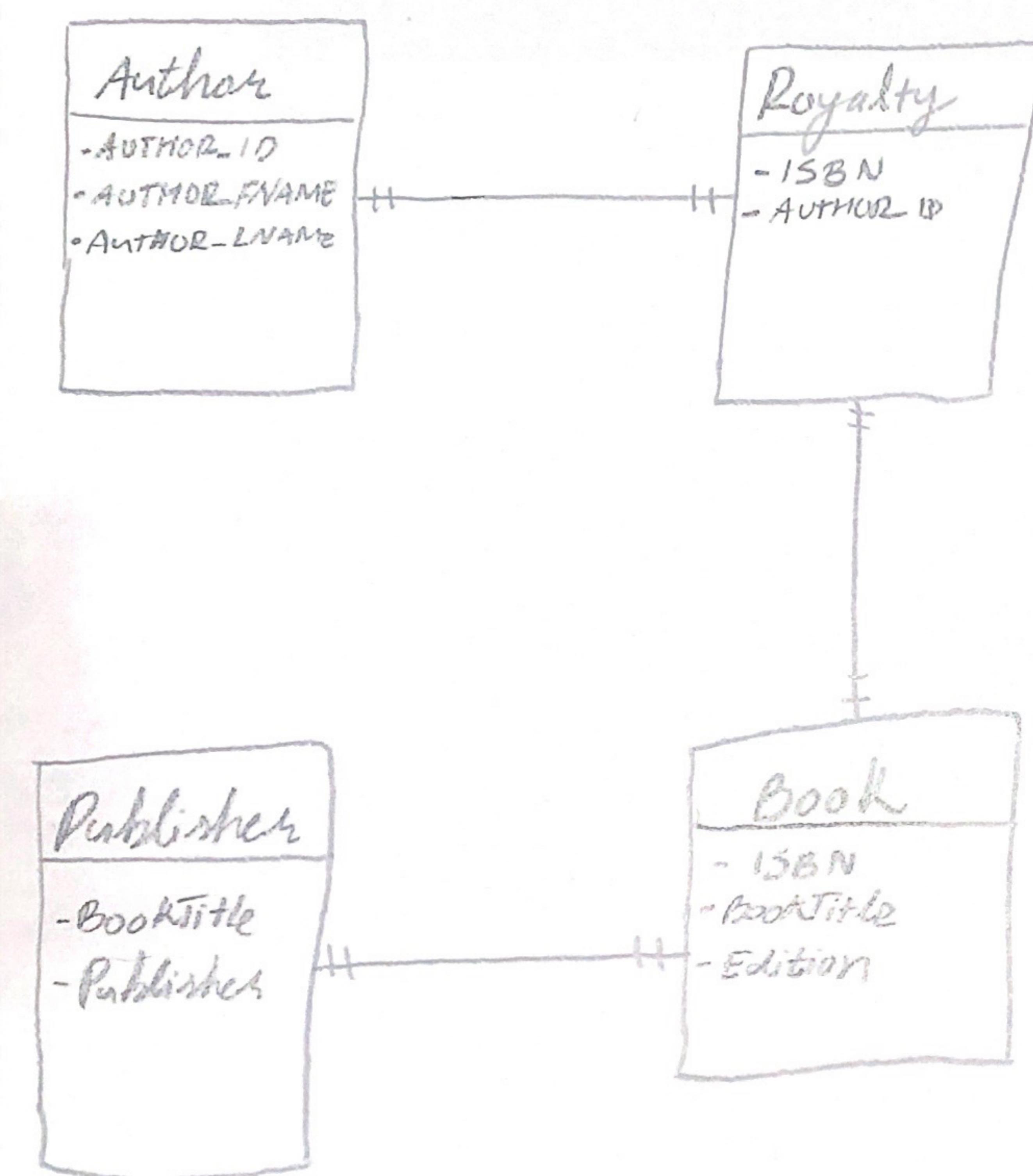
[10 Points]

- Entities: Author, Royalty, Publisher, Book.

• Author: AUTHOR_ID, AUTHOR_FNAME, AUTHOR_LNAME

• Royalty: ISBN, AUTHOR_ID

• Publisher: BOOKTITLE, Publisher



Name:- _____

Id#:- _____

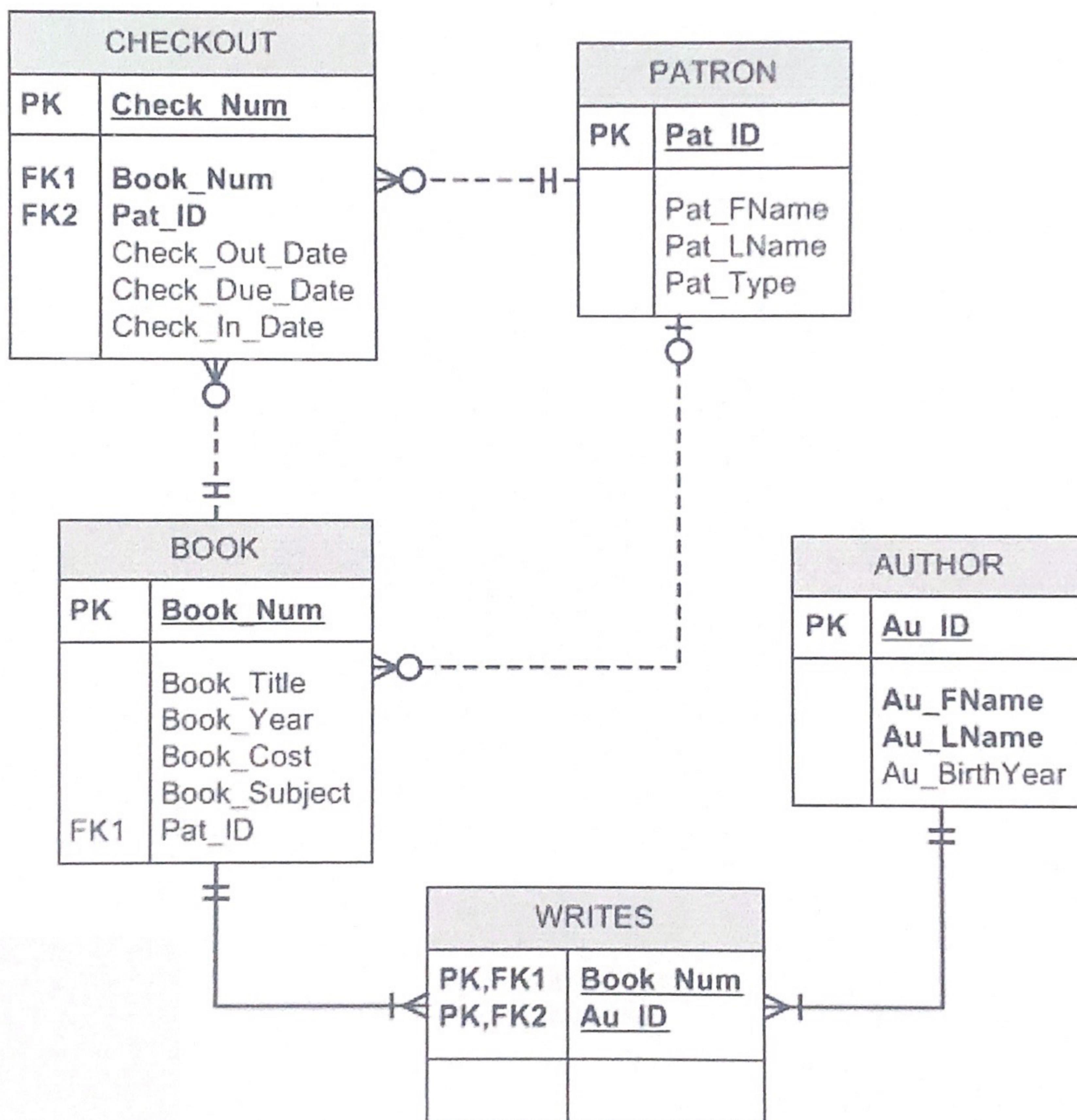
Question 3:-

[25 Points]

Use the ERD diagram below to answer parts (a) to (f). Use the 'Final Exam Data File.txt' provided under the Final Exam section in Canvas to create the tables and insert data.

Note:-

1. This is the **same dataset used for Problem Set 4** – if you already created the tables and inserted data, no need to recreate.
2. Note that the sample output may not include all rows from the query results.



Name:- _____

Id#:- _____

- a) Write a query to display the patron ID, first and last name of all patrons who have never checked out any book. Sort the result by patron last name and then first name [5 Points]

Sample Output:- Patrons who have never checked out a book

PAT_ID	PAT_FNAME	PAT_LNAME
1166	Vera	Alvarado
1180	Nadine	Blair
1238	Erika	Bowen
1208	Ollie	Cantrell
1227	Alicia	Dickson
1205	Claire	Gomez
1239	Elton	Irwin
1240	Jan	Joyce
1243	Roberto	Kennedy
1242	Mario	King
1237	Brandi	Larson
1167	Alan	Martin
1182	Jamal	Melendez
1201	Shelby	Noble
1244	Leon	Richmond
1200	Lorenzo	Torres
1241	Irene	West

Name:- _____

Id#:- _____

- b) Write a query to display the author last name, first name, book title, and replacement cost for each book. Sort the results by book number and then author ID. [5 Points]

AU_LNAME	AU_FNAME	BOOK_TITLE	BOOK_COST
Durante	Reba	Beginner's Guide to JAVA	59.95
Walsh	Neal	Database in the Cloud	79.95
Reeves	Benson	Mastering the database environment	89.95
Palca	Julia	Conceptual Programming	59.95
Salvadore	Carmine	J++ in Mobile Apps	49.95
Paulsen	Connie	J++ in Mobile Apps	49.95
Sheel	Lawrence	J++ in Mobile Apps	49.95
Beatney	Rachel	iOS Programming	79.95
Paulsen	Connie	JAVA First Steps	49.95
McGill	Rachel	JAVA First Steps	49.95
Aggerwal	Manish	C# in Middleware Deployment	59.95

- c) Write a query to display the book number, title, and cost of books that have the lowest cost of any books in the system. Sort the results by book number. [5 Points]

Sample Output:- Least Expensive Books

BOOK_NUM	BOOK_TITLE	BOOK_COST
5239	J++ in Mobile Apps	49.95
5241	JAVA First Steps	49.95
5248	What You Always Wanted to Know About Database, But Were Afraid to Ask	49.95
5254	Coding Style for Maintenance	49.95

Name:- _____

Id#:- _____

- d) Write a query to display the book number and the number of times each book has been checked out. Do not include books that have never been checked out. Sort the results by the number of times checked out in descending order and then by book number in descending order. [5 Points]

BOOK_NUM	Times Checked Out
5236	12
5235	9
5240	7
5238	6
5237	5
5254	4
5252	4
5249	4
5246	4
5244	4
5242	4
5248	3
5243	2

Name:- _____

Id#:- _____

- e) Write a query to display the author ID, first and last name for all authors who have never written a book with the subject Programming. Sort the results by author last name. [5 Points]

AU_ID	AU_FNAME	AU_LNAME
581	Manish	Aggerwal
251	Hugo	Bruer
262	Xia	Chiang
438	Perry	Pearson
284	Trina	Tankersly
383	Neal	Walsh