Imperial College Business School

MSc Business Analytics Examinations 2018/2019

For internal Students of Imperial College of Science Technology and Medicine.
This paper also forms part of the examination for the Associateship.

Fundamentals of Database Technologies

(BS1804)

Mock exam

Thursday December 13 2018
12:30 – 14:30

Instructions

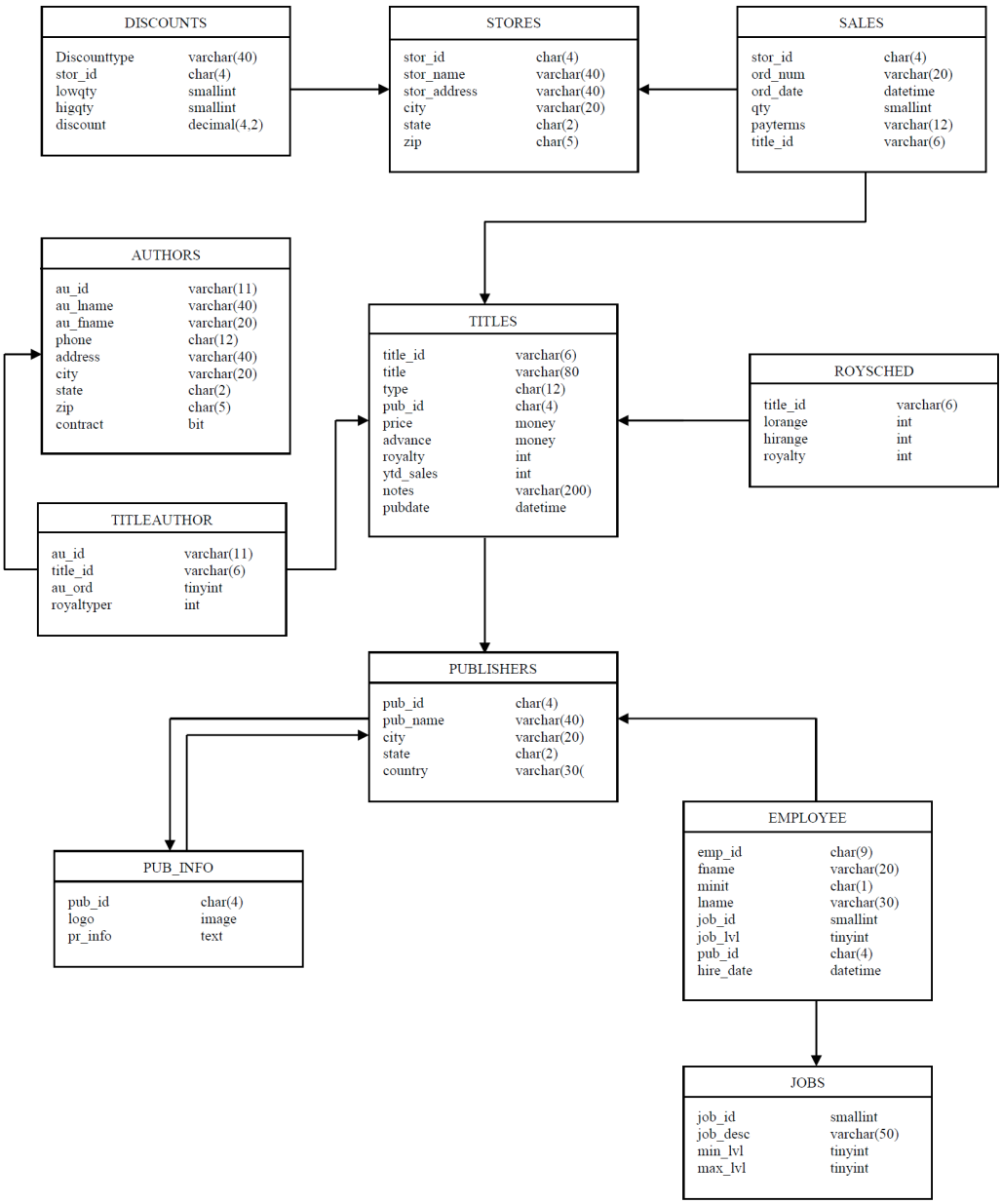
Answer **ALL** questions from both Part A and Part B.

Assume you are using the Postgres dialect of SQL.

College approved calculators may be used.

The supplied SQL information sheet may be used.

Refer to the following ER diagram for Parts A and B.



Part A: Theory questions

Question 1
5 marks

Explain why we use normal forms to ensure good database design, with reference to the benefits of 1NF and 2NF.

Question 2
3 marks

Explain the difference between 2NF and 3NF.

Question 3
3 marks

Describe the three different kinds of relationships commonly used in SQL databases, showing how primary keys and foreign keys are used to make connections between tables in each case.

All subsequent questions use the database schema provided earlier in the question paper.

Question 4
4 marks

a) Is the relationship between discounts and stores a many-to-many relationship, or not? Explain how you know this.

b) Is the relationship between titles and authors a many-to-many relationship, or not? Explain how you know this.

Part B: Queries

Question 1
2 marks

Write an SQL query to return all data from the titles table.

Question 2
2 marks

Write an SQL query to return each title's revenue so far this year (price multiplied by year to date sales).

Question 3
3 marks

Write an SQL query to show the full name of each author, and the average price of books by that author.

Question 4
3 marks

Write an SQL query to show the id of each store, and the number of discounts present in that store.

Question 5
4 marks

Write an SQL query to show the first and last name of each employee, along with their publisher ID and the average salary of employees employed by that publisher.

Question 6

6 marks

i) Show all sales in chronological order; use a window function to add a new column which shows the cumulative total price in chronological order.

ii) Show the same results, but change the final column to show the cumulative total sale price within each title (rather than across all titles).