MCQs:
Q1. B
Q2. A

Subjective:
Q1. See lecture slides ch6 Key constraints:Defining Superkey, Key.
Entity integrity constraints: Defining primary key
Referential integrity constraints: Defining foreign key
Q2. METADATA: A DBMS catalog stores the description of a particular
database (e.g. data structures, types, and constraints)
VIEW: application programs hide details of data types. Views can also
hide information (such as an employee's salary) for security purposes.
SCHEMA: Similar to types and variables in programming languages
INSTANCE: the actual content of the database at a particular point in
time
Q3. 1) No data redundancy and file inconsistency 2) Data isolation
allowed or many others. Refer Slides Ch1

ER Diagram: Check yourself. You can refer to Slides Ch3 &4

Relational Algebra
Q1. $\pi_{StName}(\sigma_{STUDENTS.StId=borrows.StId}\ (\sigma_{Major='CS'}(STUDENTS) \times borrows))$
Q2. $\pi_{Title}(\sigma_{AName='Silberschatz'}\ (\sigma_{has\text{-}written.DocId=BOOKS.DocID}(has\text{-}written \times BOOKS)))$
Or can be written as $\pi_{Title}(\sigma_{has\text{-}written.DocId=BOOKS.DocID}\ (\sigma_{AName='Silberschatz'}(has\text{-}written) \times BOOKS))$
Q3. $\pi_{StName}(STUDENTS) - \pi_{S1.StName}(\sigma_{S1.Age>S2.Age}(\rho_{S1}(STUDENTS) \times \rho_{S2}(STUDENTS)))$