Q1.

a)
```
SELECT S.s-id, S.s-name, S.s-year
FROM Student S, Course C, Enroll E
WHERE S.s-dept = 'CS' AND
        C.c-dept = 'MATH' AND
        C.credits = 4 AND
        E.semester = 'Spring' AND
        E.year = 2023 AND
        E.s-id = S.s-id AND
        E.c-id = C.c-id;
```

b)
```
SELECT S.s-id, S.s-name
FROM Student S
WHERE S.s-year = 4 AND
        S.s-id NOT IN (SELECT E.s-id FROM Enroll E WHERE E.grade = 'F');
```

c)
```
SELECT S.s-id, S.s-name
FROM Student S, Enroll E
WHERE S.s-dept = 'CS' AND
        S.s-year = 1 AND
        E.semester = 'Spring' AND
        E.year = 2023 AND
        E.grade = 'A' AND
        E.c-id = 'CS101' AND
        E.s-id = S.s-id
ORDER BY S.s-name ASC;
```

d)
```
SELECT S.s-id, S.s-name
FROM Student S, Course C, Prereq P, Enroll E
WHERE S.s-dept = 'CS' AND
        E.semester = 'Spring' AND
        E.year = 2023 AND
        E.grade = 'A' AND
        E.c-id = C.c-id AND
        P.p-id = 'MATH101' AND
        P.c-id = C.c-id AND
        E.s-id = S.s-id;
```

e)
```
SELECT S.s-id, S.s-name, S.s-dept
FROM Student S, Enroll E
WHERE E.grade = 'F' AND
        E.c-id = 'MATH101' AND
        E.year = 2022 AND
        E.s-id = S.s-id AND
        E.semester IN ('Spring', 'Fall')
GROUP BY S.s-id, S.s-name, S.s-dept
HAVING COUNT(*) = 2
ORDER BY S.s-dept ASC, S.s-name ASC;
```

f)
```
SELECT S.s-id, S.s-name
FROM Student S
WHERE S.s-dept = 'EE' AND
        S.s-year = 4 AND
        NOT EXISTS (
        SELECT C.c-id
        FROM Course C, Prereq P
        WHERE C.c-dept = 'MATH' AND
                P.p-id = 'MATH101' AND
                P.c-id = C.c-id AND
                C.c-id NOT IN (
                SELECT E.c-id
                FROM Enroll E
                WHERE E.s-id = S.s-id
                )
        );
```

g)
```
SELECT S.s-id, S.s-name
FROM Student S, Enroll E
WHERE S.s-dept = 'CS' AND
        E.c-id = 'PHYS101' AND
        E.s-id = S.s-id
GROUP BY S.s-id, S.s-name
HAVING COUNT(*) = 1;
```

h)
```
SELECT S.s-id, S.s-name
FROM Student S, Enroll E
WHERE S.s-dept = 'CS' AND
        E.semester = 'Spring' AND
        E.year = 2023 AND
        E.grade = 'A' AND
        E.s-id = S.s-id
GROUP BY S.s-id, S.s-name
HAVING COUNT(*) >= 3;
```

i)
```
SELECT S.s-dept, COUNT(*)
FROM Student S, Enroll E
WHERE E.c-id = 'MATH101' AND
        E.semester = 'Spring' AND
        E.year = 2023 AND
        E.grade = 'A' AND
        E.s-id = S.s-id
GROUP BY S.s-dept;
```

j)
```
SELECT C.c-dept, C.c-id
FROM Course C
WHERE NOT EXISTS (
        SELECT 1
```

```
        FROM Course C1
        WHERE C1.c-dept = C.c-dept AND
        (SELECT COUNT(*) FROM Prereq P WHERE P.c-id = C1.c-id) >
        (SELECT COUNT(*) FROM Prereq P WHERE P.c-id = C.c-id)
    );
```

Q2.

a)
```
SELECT DISTINCT cname
FROM books, purchase, customers
WHERE books.publisher = 'ABC' AND
        books.isbn = purchase.isbn AND
        purchase.cid = customers.cid;
```

b)
```
SELECT publish-year, COUNT(DISTINCT isbn) AS book-count
FROM books
WHERE publisher = 'ABC'
GROUP BY publish-year;
```

c)
```
CREATE TEMPORARY TABLE Temp AS
SELECT cid, COUNT(DISTINCT isbn) AS book-count
FROM books JOIN purchase ON books.isbn = purchase.isbn
WHERE books.publisher = 'ABC'
GROUP BY cid;

SELECT cname
FROM Temp JOIN customers ON Temp.cid = customers.cid
WHERE book-count > 10;
```