Q1 a) Let $X = \Pi_{sid, pid}(catalog)$, X is list of all supplier to parts ids pairs

$Y = \Pi_{sid}(catalog) \times \Pi_{pid}(\sigma_{color = "blue"}(Parts))$

Here is a list of all possible supplier and parts (Blue color only) ids pairs

$Z = Y - X$, Z is list of all those ids of suppliers who do not sell atleast one blue part.

∴ Sid of suppliers who sell all blue parts

$= \Pi_{sid}(catalog) - \Pi_{sid}(B)$

Q1 b) With msup (sid, sname, price) as

Select distinct C1.sid, S1.sname, C1.price
from catalog as C1, catalog as C2, suppliers as S1
where C1.sid = C2.sid and C1.sid = S1.sid
and C1.pid <> C2.pid

(select distinct (sid, sname, price)
from msup)
except
(select distinct (sid, sname, price)
from msup as M1, msup as M2
where M1.sid = M2.sid and M1.price > M2.price)

Q1 c) $\{ \langle sname, color \rangle \mid \exists\ sid, address\ (\langle sid, sname, address \rangle \in suppliers \wedge \exists\ pid, price\ (\langle sid, pid, price \rangle \in catalog \wedge \exists\ pname, color\ (\langle pid, pname, color \rangle \in Parts)))\}$

Q1 d) SQL is context free. So non-context free but decidable queries cannot be computed by SQL.
For example find all fibonacci series made sids and pids of database.

Q 2. F 2: BF → ADEC

F3 : DE → B

Q3 b) We could form a new weak entity prescribition that some relation with patient ~~SSN~~, doctor and drugs.

Q3 a)