BCNF Decomposition Exercise

Given the universal relation schema:

$$R(eid, pid, hours, ename, city, did, dname, mgrid, pname, ploc)$$

the FDs:

$$
\begin{aligned}
eid, pid &\rightarrow hours & (1) \\
eid, pid &\rightarrow dname & (2) \\
eid &\rightarrow ename, city, did, mgrid & (3) \\
did &\rightarrow dname, mgrid & (4) \\
pid &\rightarrow pname, ploc & (5)
\end{aligned}
$$

and the data:

eid	pid	hours	ename	city	did	dname	mgrid	pname	ploc
101	1	20	smith	atl	10	toy	103	acme	atl
101	2	25	smith	atl	10	toy	103	ajax	chi
102	1	40	jones	mac	15	shoe	105	acme	atl
103	2	25	brown	mar	10	toy	103	ajax	chi
103	3	25	brown	mar	10	toy	103	aaa	mia
104	1	40	green	mac	15	shoe	105	acme	atl
105	2	40	black	atl	15	shoe	105	ajax	chi

- Is the set of functional dependencies above a minimal cover set?

- What is the key of R?

- Decompose the universal relation schema R into BCNF relation schemas and show how the data above would be stored in states of the new set of relation schemas.