CS 334 Database System
ps01

1. A primary key is a key in a relation that is unique for each tuple. If a student has more than one advisor, then there will be more than one tuples in the relation with the same "s_id" which violates the definition of "primary key". Instead of using "s_id" as the primary key, using a pair of attributes consisting of {s_id, i_id } will be a better option as it is unique for each tuple.

2. Assuming every attribute and tuple is unique. It's basically multiplying permutation of the attributes and permutation of the tuples to calculate the ways.

 a) Multiplying the permutation of 3 and 3:
 Ways $= 3! \cdot 3! = 6 \cdot 6 = 36$
 b) Multiplying the permutation of 4 and 5:
 Ways $= 4! \cdot 5! = 24 \cdot 120 = 2880$
 c) Multiplying the permutation of n and m:
 Ways $= n! \cdot m!$

3.
 (a) The attribute "producerCertNum" in relation "Movie" should be a foreign key, referencing attribute "certNum" in relation "MovieExec".
 (b) The attribute { movieTitle, movieYear } in relation "StarsIn" should be a foreign key, referencing attribute { title, year } in relation "Movie".
 (c) The attribute "starName" in relation "StarsIn" should be a foreign key, referencing attribute "name" in relation "MovieStar".
 (d) It's not possible to be done as a foreign key constraint. The foreign key in "Movie" must refer to the primary key in "StarsIn". Even if { title, year } can refer to { movieTitle, movieYear}. However, { movieTitle, movieYear} does not form a primary key in relation "StarsIn" for the fact there could be more than one star in a movie. And in fact, the primary key of "StarsIn" contains three attributes { movieTitle, movieYear, starName}. Therefore, it's not possible.

4.

Table 1: artist_credit relation

artist_credit		
id	name	artist_count
1001	Queen & David Bowie	2
1002	Jean-Michel Jarre	1
1003	Tracy W. Bush, Derek Duke, Jason Hayes and Glenn Stafford	4

Table 2: artist_credit_name relation

artist_credit_name				
artist_credit	position	artist	name	join_phrase
1001	1	101	Queen	&
1001	2	102	David Bowie	Null
1002	1	103	Jean-Michel Jarre	Null
1003	1	104	Tracy W. Bush	,
1003	2	105	Derek Duke	,
1003	3	106	Jason Hayes	and
1003	4	107	Glenn Stafford	Null

Table 3: artist relation

artist	
id	name
101	Queen
102	David Bowie
103	Jean Michel Jarre
104	Tracy W. Bush
105	Derek Duke
106	Jason Hayes
107	Glenn Stafford