Open Questions – Marked Assignments

**Assignment 1**

1.2 a) The final result would be |P(A) x P(B)|  
= 2^|A| \* 2^|B| = 2^|A|+|B|.  
1.2 b) You are missing some relations. For example (4,4) or (5,5) etc.  
1.2 c) no short explanation given!  
1.3 b) in the column of vertex 5 there are no 0, but only 1s.  
1.4 a) you didn't give the degree of the vertex.  
1.4 b) the graph is planar, you also drew it without crossing any edges. So it is planar.   
**(Check your notes if you have the correct info also)**  
1.5 a) For G1 there is Eulerian cycle, but you didn't give an example.  
  
  
**Assignment 2**  
2.1 a): The graph has 3 connected components: {1,6,7} {2,3,8} {4,5}  
2.1 b): (1) Your given spanning tree has a connection between node 4 and 5. In the given graph there is no connection between these nodes. So a spanning tree of this graph can not have a connection between 4 and 5.  
2.3 c): We are talking about a complete binary tree here. So a tree with the height of 10 has 1023 nodes - 1 = 1022 edges.  
2.3 e): no answer given. The maximum height is 300. Each node has only one child and the tree is degenerated to a linear list.  
 **I mean this question can be seen in different ways, I can consider like a Binary tree as well not like a list too??**  
  
2.4 b): incorrect reconstructed tree. The correct tree would look like this: g is the root node. On the left side there is node e with childs c and d. d has the childs a (left) and b (right). f is the right-side child node of g.  
 **You did solve it, but quickly solve Infront so that you can be sure**

**Assignment 3**

3.6 Only a answer for a) given.  
  
These were never done by you SON (They dont know you SON)  
b) a(a|b|c)\*a| b(a|b|c)\*b | c(a|b|c)\*c  
c) (a|b|c)((a|b|c)( a|b|c))\*

**Assignment 4**

4.2 a) your solution is almost correct. There is one small error. In the final step there is one "b" too much in the bracket (ab should only be a).  
b) Both words start with "a". So you can even more simplify the term. And "+" should be "\*".  
4.4 It was necessary that you also provide a short justification for your answer. That is only given at d).  
4.5 a) (1) you correctly derived the word but the derivation tree is wrong.  
**So i need to write the whole thing at the start since A generates baAb and and then later when i open A it is generating C**  
  
d) parameter "m" is not specified. But almost correct solution.  
4.7 a) Your solution has one small error. For the words for the right side of the union is an option with the empty word missing. Because it's possible that the word is "cc" and you can't build this word with your context-free grammar.

**S 🡪 AbB  
A 🡪 aAc  
 |b  
B 🡪 cDc  
D 🡪 baD  
 |epsilon**

**Assignment 5**

5.4 a) There is an error in the last part of S. The order should be S->c and not c->S.  
5.7 (2) Is not valid because inside c-element there can be either a d-element or an e-element, but not both.  
So the meaning of the Or Operator is that this OR that, we cannot say both can exist?

**Assignment 6**6.4 a): Your automaton is not a DFA because its missing transitions. In a DFA every state has to have a transition for every symbol.  
**This means that the we need to create always also the error state where we point in the strings that do not have to be generated by a state according to the question**

b): This is also not a DFA. In a DFA empty words (e) are not allowed.  
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6.9 a): in the first step you also marked (a,f) which is incorrect because both states are accept states. In the 2nd step you mark (d,e) but thats incorrect because (d,d) and (f,f) are not marked. They are marked as equivalent because its the same state, but they are not marked as distinguishable. For that reason (d,e) can't be distinguishable.  
b): The automaton can be minimalist because (d,e) is not marked.