 Xi’AN JIAOTONG-LIVERPOOL UNIVERSITY

西 交 利 物 浦 大 学

COURSEWORK SUBMISSION COVER SHEET

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Programme Information and Computing Science

Module Title Algorithmic Foundations and Problem Solving

Module Code CSE102

Assignment Title Assignment 2

Submission Deadline Tuesday, May 7th, 2019

Module Leader Wen.Jin Lv

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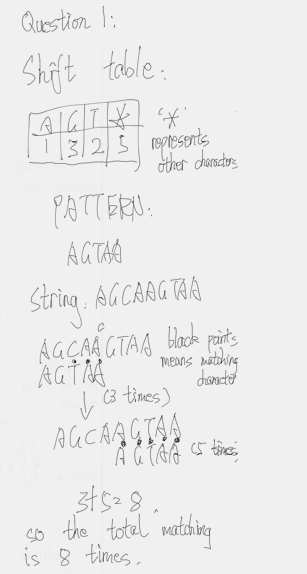
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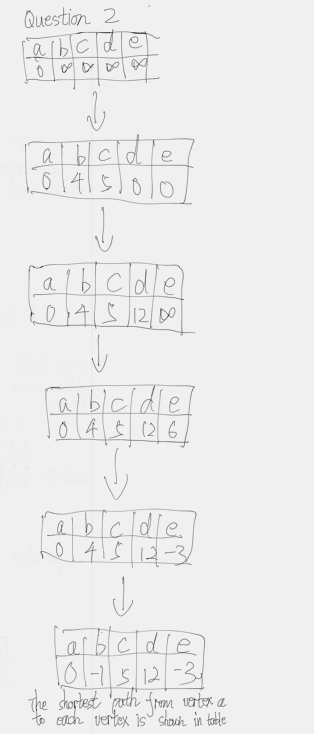
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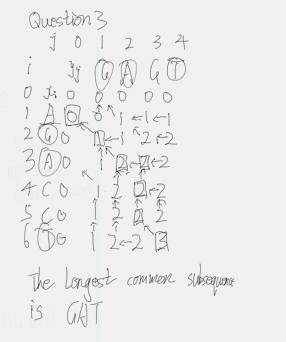
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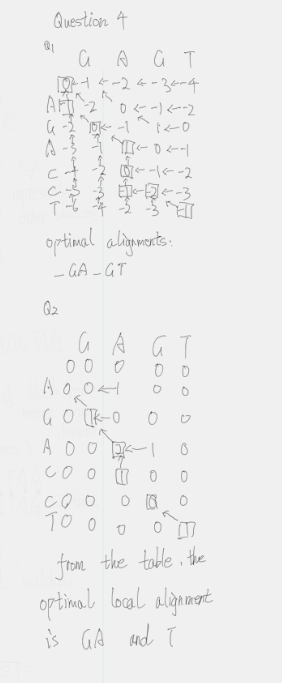
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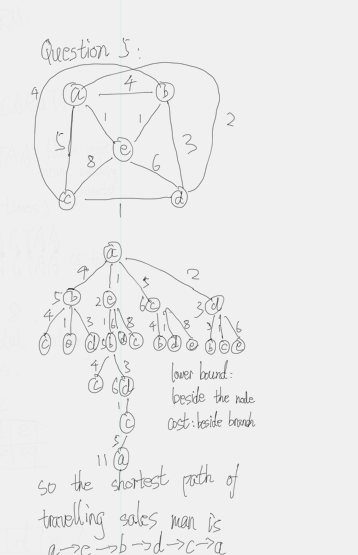
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Question 6:

Which of the following statements do not contradict the current knowledge about the complexity classes P…?

Choice:

P is not equal to NP,NP is equal to P and NPC and P intersection NPC is equal to empty set (option 3)

reason：

P problems must be NP problems because the answer can be found within polynomial time, which means that the answer must be verified within polynomial time. But because of the NPC problem, we believe that np problems are not P problems. The NPCS class problem is a subset of the NP class problem. The core idea of the NPCS class problem is reduction, usually to transform a class of problem into a more complex problem, so as to solve all the same type of constrained problem with this more complex problem. In this case, the time complexity of np class problems will increase exponentially after being transformed into NPC problems, which makes it difficult for a problem to be found and solved in polynomial time. The most typical SAT problem, the problem is a time complexity of the worst case has reached O(n^4) algorithm, such examples are many. Therefore, it is difficult to find the definition of the solution for P class problems in polynomial time. To sum up, NPC problem should be different from P problem.

Question 7: YES