1. True or false. [4 marks]

(a) "Computer Science "is a wrong name as a discipline, from the viewpoints of either science or engineering.[2 marks]

True

(b) It is the "decision problem" leads to the notion and/or concept of "computation", and motivates research on computability.[2 marks]

True

2. Please tell us (a)the components of a Turing machine,[1 mark] and (b)their functions.[1 mark] If possible, try to (c)explain how a Turing machine works in your own words.[1 mark]

(a) There are **state register**, **control unit**, **tape** and **read/write head** in Turing machine.

(b)

a) **Status register:** Save the state of Turing machine and record the work of Turing machine.
b) **Control unit:** a control system which can determine the action of the next step of the read/write head according to the current state of the machine, and change the value of the current register. There are three types of commands:
   i. Move the head
   ii. Assume the same or a new state as prescribed.
   iii. Eraser or write a symbol.
c) **Tape:** the tape is of a infinite length**,** and be divided into many blocks, each block contain empty or symbols. This tape store the information we need.
d) **Read/write head:** move through the tape, can read the information from the tape or write the symbol on the current block.

3. Could you please think of two jobs that are highly related to computer science? And how about computer technology/engineering? Please list at least two jobs for each [2 marks] and tell us the reasons [1 mark] (differences between science and technology/engineering).

For computer science:

1. Professor of CS department.

2. Algorithm Researcher in research center. For example, AI researcher in Alibaba DAMO Academy.

For computer engineering:

1. Embedded development engineer
2. Software architect

For people with computer science jobs, they pay more attestation on the research work, they don't care whether the thing they work on could be used in "real life", in comparison, they spend more time on those problems near the mathematics. But for engineering, most of them are some like "the developer", they focus on the "real life" and real problem, they works are make applications and these applications should be mature products. So they may not eager to something new, but something can perform well in deal with problem. And the achievements of computer scientists(for example advanced algorithms) could be used by engineers to solve the problem real life by translate them into real applications, and which may convenient for people's lives