1. Please translate the following paragraphs into Chinese. (50 points)

(Source: *Wikipedia* Website)

Failure rate is the frequency with which an engineered system or component fails, expressed for example in failures per hour. It is often denoted by the Greek letter λ (lambda) and is important in reliability engineering.

The failure rate of a system usually depends on time, with the rate varying over the life cycle of the system. For example, as an automobile grows older, the failure rate in its fifth year of service may be many times greater than its failure rate during its first year of service. One does not expect to replace an exhaust pipe, overhaul the brakes, or have major transmission problems in a new vehicle.

In practice, the Mean Time Between Failures (MTBF, or λ) is often used instead of the failure rate. The MTBF appears frequently in the engineering design requirements, and governs frequency of required system maintenance and inspections. In special processes called renewal processes, where the time to recover from failure can be neglected and the likelihood of failure remains constant with respect to time, the failure rate is simply the multiplicative inverse of the MTBF (1/λ).

A similar ratio used in the transport industries, especially in railways and trucking is '**Mean Distance Between Failure**', a variation which attempts to correlate actual loaded distances to similar reliability needs and practices.

Failure rates and their projective manifestations are important factors in insurance, business, and regulation practices as well as fundamental to design of safe systems throughout a national or international economy.

Failure rate in the discrete sense

In words appearing in an experiment, the failure rate can be defined as

> The total number of failures within an item population, divided by the total time expended by that population, during a particular measurement interval under stated conditions.
> (MacDiarmid, *et al.*)

While failure rate $\lambda(t)$ is often thought of as the probability that a failure occurs in a specified interval, given no failure before time t, it is not actually a probability because it can exceed 1. It can be defined

with the aid of the reliability function or survival function $R(t)$, the probability of no failure before time t, as:

$$\lambda = \frac{R(t_1) - R(t_2)}{(t_2 - t_1) \cdot R(t_1)} = \frac{R(t) - R(t + \triangle t)}{\triangle t \cdot R(t)}$$

where t_1 (or t) and t_2 are respectively the beginning and ending of a specified interval of time spanning Δt. Note that this is a conditional probability, hence the $R(t)$ in the denominator.

Failure rate in the continuous sense

By calculating the failure rate for smaller and smaller intervals of time Δt, the interval becomes infinitely small. This results in the **hazard function**, which is the *instantaneous* failure rate at any point in time:

$$h(t) = \lim_{\Delta t \to 0} \frac{R(t) - R(t + \triangle t)}{\triangle t \cdot R(t)}.$$

Continuous failure rate depends on a **failure distribution**, $F(t)$, which is a cumulative distribution function that describes the probability of failure prior to time t,

$$P(\mathbf{T} \leq t) = F(t) = 1 - R(t), \quad t \geq 0.$$

where T is the failure time. The failure distribution function is the integral of the failure *density* function, $f(t)$,

$$F(t) = \int_0^t f(x)\, dx.$$

The hazard function can be defined now as

$$h(t) = \frac{f(t)}{R(t)}.$$

Many probability distributions can be used to model the failure distribution. A common model is the **exponential failure distribution**,

$$F(t) = \int_0^t \lambda e^{-\lambda x}\, dx = 1 - e^{-\lambda t},$$

which is based on the exponential density function.

$$h(t) = \frac{f(t)}{R(t)} = \frac{\lambda e^{-\lambda t}}{e^{-\lambda t}} = \lambda$$

For an exponential failure distribution the hazard rate is a constant with respect to time (that is, the distribution is "memoryless"). For other distributions, such as a Weibull distribution or a log-normal distribution, the hazard function may not be constant with respect to time. For some such as the deterministic distribution it is monotonic increasing (analogous to "wearing out"), for others such as the Pareto distribution it is monotonic decreasing (analogous to "burning in"), while for many it is not monotonic.

2. 請將下面的中文文章精簡成大約 250 個字的英文摘要。(50 points)

(原文作者：凱露 BBC 中文網記者)

中美就人民幣升值問題一直爭執不斷，最近中美兩國圍繞人民幣升值問題的爭執此起彼伏，不亦樂乎。

中國外交部發言人秦剛本周四（18 日）表示，人民幣匯率不是造成中美貿易不平衡的主要原因。同時，中國商務部發言人姚堅更是強硬地回應了美國施壓人民幣升值的呼聲。他說，中國貿易順差不是人民幣升值的理由，中國拒絕美國對人民幣升值的要求。與此同時，中國總理溫家寶之前也曾表示中國不會屈服於國際的壓力，讓人民幣升值。

而美國方面則認為，為促進國內經濟增長，人民幣被人為的壓低，中國的外匯政策歪曲了全球市場，現在是該停止這種政策的時候了。

就在雙方你來我往、相互指責之際，中國商務部副部長鐘山將於 3 月 24-26 日率團訪問美國，試圖就中美貿易平衡、貿易摩擦和人民幣匯率等問題與美方進行溝通以及磋商。

有國內學者認為此舉意味著中國希望用對話方式解決問題，而不希望使矛盾進一步的升級。那麼，從客觀來講，人民幣到底應不應該升值？英國劍橋大學經濟學家張煒認為，撇開政治因素，完全從經濟角度來看，人民幣的價值確實被低估了。他說，中國對其主要貿易伙伴都存在較大的貿易順差，而匯率是用於貿易結算的主要工具。中國自從 1994 年相對於美元一次性大幅度的貶值以來，對它的主要國際貿易伙伴都存在貿易順差。這一事實本身就證明，人民幣是被低估的，應該重新調整。

在中美兩國針對人民幣升值的問題上互不相讓、針鋒相對之際，中國人民銀行副行長蘇寧對美國總統奧巴馬敦促人民幣升值的言論也作出回應說，不要把人民幣匯率問題政治化。張煒認

為，其實無論中國還是美國都在把人民幣匯率問題政治化，而這是一種不健康的心態。首先，美國由於受經濟危機的影響，一些議員為贏得國內的選票，把美國工作機會的流失歸罪於中國。再來看中國，中國所有的領導人幾乎眾口一詞的認為：人民幣不能升值。這本身就是把人民幣升值政治化的表現。其次，中國的主流學者為了保持「政治正確」也支持人民幣升值會帶來種種不利的說法。似乎在中國，要不要把人民幣升值的問題變成了愛不愛國的問題。

同時，在美國下月即將發表的財政報告有可能把中國列為「匯率操縱國」之前，中國也先發制人的指出美國才是世界上最大的「匯率操縱國」。中國還指責美國貶低本國的幣值、施壓別國貨幣升值並建立貿易壁壘的做法是不公平的。張煒認為，沒有哪一個國家會對貨幣完全放任不管，但關鍵是要在市場的準則下進行透明的干預。而中國對匯率的干預不光是市場的干預，還有行政的干預，並且是不透明的干預。這正好成為別人攻擊中國的把柄。張煒還說，匯率問題不僅是一個國家的內部問題，它還是一個國際問題。

二戰後成立的國際貨幣基金組織 IMF，其中的一個重要職能就是要防止世界各國通過壓低本國貨幣匯率而進行貿易戰。當然，張煒也承認，匯率是升是降，什麼時候升？什麼時侯降？是由各個國家說了算，但卻不能完全不聽別人的建議和意見。

中國政府為什麼對人民幣升值如此拒抗和擔心呢？張煒指出，人民幣升值可能會影響中國產品在國際上的競爭力，繼而影響中國的出口企業以及就業市場。同時，人民幣升值也會導致大量熱錢湧入中國，從而擾亂中國金融市場的秩序。然而，人民幣升值也會帶來許多好處。例如它有助於促進產業的結構調整。張煒說，目前中國的產業結構大量依賴於出口。如果人民幣升值則會導致那些簡單、重覆性產品成本的上升，這樣迫使中國必須下力氣尋求高附加值的產品。此外，人民幣升值也會使中國老百姓獲得好處，增加他們的財富，增強他們購買國外資產的能力。中國目前面臨通貨膨脹的危險，通常一個國家的貨幣升值可以使它更容易通過進口產品來遏制國內的通貨膨脹，因此它是遏制通貨膨脹比較有效的機制之一 。

很多中國的政客和學者似乎認為保持人民幣穩定有助於中國經濟發展。那麼，人民幣升值會導致中國經濟增長停頓嗎？對此，張煒認為不一定。這關鍵要看政府的應對措施。他說，中國民間經濟的生存能力其實相當強。如果沒有政府的壟斷，他們會尋找調整的契機。當然，在轉換的過程中會有摩擦，但政府應當承擔責任，幫助倒閉的中、小企業和失業者尋找新發展的機會。

因此，如果簡單的說人民幣升值會導致中國經濟發展的停頓就過於簡單化了，而政府在這方面的作用和政策是具有很大的影響力的。張煒認為，人民幣升值是未來的大趨勢，儘管中美兩國表面上互不相讓，但實際上雙方政府對待人民幣升值的問題還是比較務實的。他說除非中國經濟崩潰，否則人民幣一定會在未來升值。而且，他觀察說，中國政治經常發生的一個有趣的現象是，當中國領導人站出來表示強硬的姿態時，他們往往早已做好了讓步的準備。