經濟部所屬台灣電力股份有限公司104年新進博士級人員甄試

類別：全部類別 **節次：第一節**

科目：共同科目(英文)

注意事項	1. 本試題共3頁(含A4紙2張)。 2. 禁止使用電子計算器。 3. 本試題分三大題(3題)，每題配分於題目後標明，共100分。 4. 須用藍、黑色鋼筆或原子筆在答案卷指定範圍內作答，不提供額外之答案卷，作答時須詳列解答過程，於本試題或其他紙張作答者不予計分。 5. 英文請就各題選項中選出最適當者為答案，未作答、答錯或書寫多於1個答案者，均不給分。 6. 本試題採雙面印刷，請注意正、背面試題。 7. 考試結束前離場者，試題須隨答案卷繳回，俟本節考試結束後，始得至原試場或適當處所索取。 8. 考試時間：90分鐘。

一、 閱讀測驗：10題，每題2分，共20分

Over the last few years, a great deal has been written about time-varying retail pricing of electricity. Retail real-time pricing (RTP) of electricity -- retail pricing that changes hourly to reflect the changing supply/demand balance -- is very appealing to economists because it "sends the right price signals." Economic efficiency gains from RTP, however, are often confused with the short-term wealth transfers from producers to consumers that RTP can create. Abstracting from transfers, several researches are done on the long-run efficiency gains from adopting RTP in a competitive electricity market. Including RTP in system balancing will further enhance system efficiency. It seems almost certain that RTP would decrease system peak loads, so using standard proportional reserve rules, it would reduce the amount of reserve capacity needed and the payments. It is found that the social gains from RTP for at least the largest customers in the system are estimated to far ***outweigh*** reasonable estimates of the metering cost. The magnitudes of the social gain are sensitive to the demand elasticity that is assumed, but the results indicate that even with quite small elasticities, the benefits are substantial. Researches also show that "time-of-use" pricing, a simple peak and off-peak pricing system, is likely to capture a very small share of the efficiency gains that RTP offers. RTP is being adopted in a number of places in many countries. The programs are relatively young (up to 15 years old), but there are already a number of examples of programs with which both the utilities and the customers are quite happy, and that have documented both peak-demand reductions and reduced need for peeking capacity.

[B] 1. According to this statement, retail real-time price (RTP) is
(A) not a good way to improve efficiency (B) more efficient than "time-of-use" pricing
(C) widely accepted by engineers (D) still a theory

[C] 2. Researchers have found that
(A) RTP is a good way to improve social equity
(B) RTP is useful in increasing peak loads
(C) RTP is important in system balancing
(D) RTP is only marginally useful in capturing social gains

[C] 3. The word ***outweigh*** in this statement is a synonym of
(A) equal to (B) at most (C) more than (D) less than

[A] 4. Based on this statement, it can be argued that
(A) RTP is very promising (B) RTP is a good off-peak pricing mechanism
(C) With RTP, reserve capacity will be bigger (D) RTP functions well in all market conditions

[B] 5. The main message of this statement is
(A) RTP is time sensitive
(B) RTP increases economic efficiency and creates social gains
(C) RTP can manage elasticity well
(D) RTP has a long and proven record

For 100 years, there has been no change in the basic structure of the electrical power grid. Experiences have shown that the hierarchical, centrally controlled grid of the 20th Century is ill-suited to the needs of the 21st Century. To address the challenges of the existing power grid, the new concept of smart grid has emerged. The existing grid is lack of communication capabilities, while a smart power grid infrastructure is full of enhanced sensing and advanced communication and computing abilities. The smart grid can be considered as a modern electric power grid infrastructure for enhanced efficiency and reliability through automated control, high-power converters, modern communications infrastructure, sensing and metering technologies, and modern energy management techniques based on the optimization of demand, energy and network availability, and so on. While current power systems are based on a solid information and communication infrastructure, the new smart grid needs a different and much more complex one, as its ***dimension*** is much larger. Smart grid can link together different components of the system with communication paths and sensor nodes to provide interoperability between them, e.g., distribution, transmission and other substations, such as residential, commercial and industrial sites. Smart gird is also ***indispensable*** in protecting the environment as renewable energy generators seem as a promising technology to reduce fuel consumption and greenhouse gas emissions. Importantly, smart grid enabling new network management strategies provide their effective grid integration in Distributed Generation (DG) for Demand Side Management and energy storage for DG load balancing, etc. Renewable energy sources (RESs) are widely studied by many researchers and the integration of RES, reducing system losses and increasing the reliability, efficiency and security of electricity supply to customers are some of the advances that smart grid system will increase.

[C] 6. According to this statement, the major difference between the existing power grid and the smart grid is
(A) power transmission capacity (B) power distribution capacity
(C) communication capacity (D) energy saving capacity

[C] 7. According to this statement, the smart grid is important in developing renewable energy sources (RESs) because
(A) smart grid is more cost effective
(B) smart grid is easier to install
(C) mart grid can better management distributed power generation
(D) smart gird is more flexible in scalability

[A] 8. The word ***indispensable*** in this statement can be replaced with
(A) essential (B) invincible (C) dependable (D) valuable

[A] 9. According to this statement, the technology advantages of smart grid do **NOT** include
(A) mobility (B) security (C) reliability (D) interoperability

[B] 10. The word ***dimension*** in this statement refers to
(A) larger capacity (B) better connectivity (C) longer life cycle (D) easier maintenance

二、翻譯：

(一) 英譯中（20分）

There are many applications, techniques and technological solutions for smart grid system that have been developed or are still in the development phase. However, the key challenge is that the overall smart grid system is lacking widely accepted standards and this situation prevents the integration of advanced applications, smart meters, smart devices, and renewable energy sources and limits the interoperability between them.

(二) 中譯英(每題10分，共20分)

1. 未來長遠電力事業的永續發展，應結合政府、電力公司及民間產業共同努力；由法規、基礎建設、科技應用及環境保育等不同層面同時進行，才能有所進展。

2. 為了滿足夏季尖峰的用電需求，必須有足夠的供電能力，並且因應機組故障、檢修或其他天候及環保限制時無法運轉的情形。因此，電力公司都訂有「備用容量率」(electricity reserve rate) 作為長期電源開發規劃的依據。

三、英文寫作：40 分

Please write an essay of up to 500 words on your opinion of whether it is necessary to prohibit smoking in all public areas.