國立成功大學

113學年度碩士班招生考試試題

編　號：160、163

系　所：能源工程國際碩士學位學程
太空系統工程研究所

科　目：科技英文

日　期：0201

節　次：第 2 節

備　註：不可使用計算機

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※ 考生請注意：本試題不可使用計算機。　請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

Part 1 (30 points) Choose only 1 correct answer for each question. Each question is worth 3 points.

1. In his speech, Dr. Chang presented all the reports about the energy crisis to _____ the need for developing new energy resources.
   (A) command　(B) formulate　(C) highlight　(D) regulate
2. The discovery of the new vaccine is an important _____ in the fight against avian flu.
   (A) breakthrough　(B) commitment　(C) demonstration　(D) interpretation
3. If you want to keep your computer from being attacked by new viruses, you need to constantly renew and _____ your anti-virus software.
   (A) confirm　(B) overlook　(C) esteem　(D) update
4. Many factors may explain why people are addicted to the Internet. One factor _____ to this phenomenon is the easy access to the Net.
   (A) advancing　(B) occurring　(C) responding　(D) contributing
5. The new computer game Wii provides us with an _____ way of exercising. People now may play sports in their living rooms, which was unimaginable before.
   (A) outgoing　(B) urgent　(C) aggressive　(D) innovative
6. There are several challenges when _____ engineering projects at universities.
   (A) conduct　(B) conducting　(C) conducted　(D) conducts
7. As technology moves forward, understanding the impact of the ionosphere on our daily lives becomes _____ important.
   (A) increasingly　(B) increase　(C) increased　(D) increasing
8. When missions are planned and carried _____ by teams with some background and experience, the failing rate is considerably lower.
   (A) in　(B) at　(C) out　(D) of
9. CubeSats have a _____ potential to foster ionospheric studies, improving our understanding of Space Weather and its effects on space and surface infrastructures.
   (A) accomplished　(B) unexpressive　(C) weak　(D) tremendous
10. Taiwan's National Science and Technology Council (NSTC) has said it plans to fund research into key fusion nuclear technologies, following the announcement of a _____ breakthrough in the field by a California-based team of researchers.
    (A) significant　(B) unexpressive　(C) illusive　(D) unexpected

Part 2 (40 points) Fill in each blank with 1 correct answer. Each question is worth 4 points.

More than 2.7 billion people will face severe shortages of fresh water by 2025. There is, __11__, only a limited amount of water on the planet. Less than 3 percent of the world's water is fresh, and most of __12__ is trapped in polar ice or buried underground in springs too deep to reach. Freshwater lakes, rivers and reservoirs may seem __13__ but provide just a drop in the bucket. Even __14__ supplies are sufficient or plentiful, they are increasingly at risk due to various forms of pollution. Fierce national competition __15__ water resources has prompted fears that water issues contain the seeds of violent conflict. International cooperation is therefore by all means urgent.

11. (A) meanwhile (B) besides (C) in fact (D) for example
12. (A) which (B) it (C) what (D) them
13. (A) scarce (B) empty (C) numerous (D) polluted
14. (A) how (B) why (C) what (D) where
15. (A) for (B) with (C) to (D) at

Today, with a couple of clicks, you can go anywhere in the world without leaving your computer. So it should come as little __16__ that the Internet has headlined the top 25 innovations of the past quarter century, according to a panel of technology leaders assembled to promote inventiveness. In creating the list, the group __17__ twenty-five non-medically related technological innovations that have become widely used since 1980. These innovations are readily recognizable by most Americans, have had a direct impact on our everyday lives, and may also dramatically affect our lives __18__. The top innovation, the Web, was created by British software consultant Tim Berners-Lee. __19__ by the multitude of information systems requiring complicated access, Berners-Lee fashioned a universal one that made information readily __20__. He created HTML (hypertext markup language) and its rule of usage (HTTP, hypertext transfer protocol). In 1991 he unveiled the World Wide Web. Today, this No. 1 invention has become so commonplace that it is almost taken for granted.

16. (A) agreement (B) surprise (C) belief (D) concern
17. (A) gives in (B) takes over (C) singles out (D) turns down
18. (A) for a moment (B) at that time (C) from then on (D) in the future
19. (A) Having frustrated (B) Frustrated (C) To be frustrated (D) Been frustrated
20. (A) available (B) consistent (C) important (D) unforgettable

Part 3 (30 points) Read the following paragraphs and choose 1 correct answer to each question. Each question is worth 5 points.

Article: John. C. Mankins, "Space Solar Power: A Major New Energy Option?", *Journal of Aerospace Engineering*, Vol. 14, No. 2, 2001. https://doi.org/10.1061/(ASCE)0893-1321(2001)14:2(38)

During the next several decades, global energy demand will grow dramatically and the management of environmental im-pacts resulting from growing power production will become an increasingly important international consideration (United Nations 1995; Ogden 1996; U.S. DOE 1997). Demand for power in space is also likely to increase, driven by human exploration of the Moon and Mars, space-science missions to the outer planets, and large-scale commercial development of space. All depend upon the availability of abundant, affordable power in space.

In 1968, Dr. Peter Glaser, of Arthur D. Little, proposed the concept of exceptionally large "solar power satellites" (SPS)as one promising approach, albeit extremely unconventional, that might meet the challenge of satisfying terrestrial power needs in an environmentally friendly way. (Note that the acronym SSP refers to space solar power in a general sense, while SPS refers to a specific application.) In this concept, solar energy is collected in a high orbit around the Earth, where sunlight is available almost continuously, and is beamed as radio waves (also almost continuously) to highly efficient receivers on the Earth.

Recent studies have also suggested that large-scale space solar-power systems (SSP) may play a key role in meeting space — and perhaps terrestrial — power needs. Unfortunately, large-scale space solar power (SSP) has not been considered seriously for many years. The last major studies were in the 1970s, sponsored by the U.S. Department of Energy (DOE) and the National Aeronautics and Space Ad-ministration (NASA) (Koomanoff 1980; National Research Council 1981; U.S. Office of Technology Assessment 1981).This effort resulted in the so-called "1979 SPS Reference System" and a program strategy that called for initial deployment as early as the 1990s. The concept and the strategy failed to engender the necessary technical or political support, and, for the most part, U.S. work on large-scale space solar power ceased in the early 1990s.

From 1995 to 2000, NASA conducted a series of studies of SSP, the goal of which was to determine whether technology advances since 1980 might make possible an SPS that could competitively deliver energy to terrestrial markets, and deliver it at a fraction of the initial investments projected in the late1970s. In the course of these studies, a family of highly promising potential space applications of large-scale SSP has also been defined, including space- and Earth-science missions, hu-man exploration, and commercial space developments. Al-though the technical challenges continue to be daunting, the conclusion of these studies was that progress had been made and that traditional studies and technology research and development (R&D) were warranted.

21. What is the primary driving force behind the anticipated increase in global energy demand in the next few decades?
    (A) Commercial space development
    (B) Human exploration of Mars
    (C) Environmental impacts
    (D) Space-science missions
22. What does the concept of Solar Power Satellites (SPS) involve?
    (A) Extracting solar energy from the Moon
    (B) Collecting solar energy in high Earth orbit
    (C) Transmitting solar energy via underground cables
    (D) Generating electricity from space debris
23. When was the last major effort to study large-scale space solar power conducted, and who sponsored it?
    (A) 1979 by NASA
    (B) Early 1990s by the U.S. Department of Energy (DOE) and NASA
    (C) 1980 by the National Research Council
    (D) Late 1970s by Arthur D. Little
24. Why did the 1979 SPS Reference System and its deployment strategy fail to materialize?
    (A) Lack of technical feasibility
    (B) Insufficient political and technical support
    (C) Overestimation of initial investments
    (D) Focus on space-science missions
25. What was the outcome of the NASA studies conducted from 1995 to 2000 regarding space solar power (SSP)?
    (A) Progress was made, and traditional studies were deemed unnecessary
    (B) SSP was deemed unfeasible for meeting terrestrial power needs
    (C) The studies concluded that SSP could not compete with conventional energy sources
    (D) Progress had been made, and traditional studies and technology research and development (R&D) were warranted
26. What potential applications of large-scale Space Solar Power (SSP) were identified in the NASA studies conducted from 1995 to 2000?
    (A) Commercial space development only
    (B) Human exploration of the Moon and Mars only
    (C) Space- and Earth-science missions, human exploration, and commercial space developments
    (D) Environmental impact assessments only