

國立成功大學  
110學年度碩士班招生考試試題

編 號： 165

系 所： 能源工程國際碩士學位學程

科 目： 科技英文

日 期： 0202

節 次： 第 2 節

備 註： 不可使用計算機

※ 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 (20 points) Choose only 1 correct answer for each question. Each question is worth 2 points.**

1. In a Stirling engine, \_\_\_\_\_ in the section between the hot and cold ends that provides the temperature gradient.  
(A) it is the air (B) that the air (C) the air (D) there is the air
2. Natural gas and gasoline are both fossil fuels, so Taiwan's long-term energy policy relies on \_\_\_\_\_.  
(A) either of them (B) both of them (C) neither of them (D) any of them
3. \_\_\_\_\_ can be used as feedstock for biomass.  
(A) To use lavender (B) That the lavender (C) Lavender (D) For the lavender
4. Your professor thinks highly of your \_\_\_\_\_ of this research.  
(A) approach (B) conduct (C) handling (D) running
5. Electric cars will not replace conventional gas cars \_\_\_\_\_ in 2022 in Taiwan.  
(A) as soon as (B) so that (C) because (D) until
6. Honey has several functions. Not only does it \_\_\_\_\_ a sore throat, it can also act as a cough suppressant.  
(A) pacify (B) lessen (C) soothe (D) resolve
7. Paying too much for a cellphone could \_\_\_\_\_ one's financial state in the short term.  
(A) ruin (B) defeat (C) disintegrate (D) restrain
8. The \_\_\_\_\_ of a new impedance analyzer are protected by a 1-year warranty.  
(A) profits (B) functions (C) advantages (D) benefits
9. The \_\_\_\_\_ of AI technology will contribute to products acting like a personal assistant.  
(A) revolt (B) uprising (C) evolution (D) insolation
10. In Tainan, only \_\_\_\_\_ engineers and technicians can install solar panels on one's roof.  
(A) legalized (B) launched (C) authorized (D) certified

**Part 2 (20 points) Fill in each blank with 1 correct answer. Each question is worth 2 points.**

Experts believe that society has a chance to allow AI to be mostly a positive force. 11 making some jobs obsolete, AI may also complement people's skills and enable them 12 more productive – as the Internet have done 13 office workers. More productive workers, in turn, 14 more goods and services that improves lives. Just as most of us today have jobs that weren't even 15 30 years ago, the same will be true 30 years from now.

11. (A) While (B) Except for (C) Distant from (D) As long as
12. (A) being (B) been (C) to be (D) be
13. (A) with (B) like (C) as (D) for
14. (A) increase (B) endorse (C) yield (D) expand
15. (A) around (B) settled (C) industrialized (D) documented

編號：165

國立成功大學 110 學年度碩士班招生考試試題

系 所：能源工程國際碩士學位學程

考試科目：科技英文

考試日期：0202，節次：2

第2頁，共5頁

The greenhouse effect is a naturally occurring process. It 16 the fact that certain atmospheric gases, such as carbon dioxide, water vapor, and methane, are able to change the energy balance of the planet by absorbing longwave radiation emitted from the Earth's surface. 17 the greenhouse effect life on this planet would probably not exist as the average temperature of the Earth would be a chilly  $-18^{\circ}$  Celsius, 18 the present  $15^{\circ}$  Celsius. As energy from the Sun 19 the atmosphere, about 51% of the Sun's radiation reaches the surface. This energy is 20 in a number of processes, including the heating of the ground surface; the melting of ice and snow and the evaporation of water; and plant photosynthesis.

16. (A) is because (B) results in (C) refers to (D) due to

17. (A) Absent (B) In addition to (C) With (D) However,

18. (A) as well as (B) similar to (C) instead of (D) rather than

19. (A) leaves (B) enters (C) cools (D) absorbs

20. (A) used to be (B) is then used (C) then gets used to (D) used

**Part 3 (10 points) Identify and correct 5 grammatic errors in the following paragraph. Each error is worth 2 points.**

Our organization deal with everything relating to academic affairs inclusive of registrar, publication, physical education, teaching information, popularizing education and general education. Scholarship retention can be applied on winners of NCKU scholarships during study suspension due to epidemic prevention. If you have paid the student group insurance, no matter if you are during suspension or not, you are covered by the student group insurance. Curriculum Division will notify each department. As long as students make online payment and online course enrollment, the registration procedure is then recognized in accordance with the NCKU's regulations. Payment time can be processed as an individual case. The students body in the Energy program at NCKU typically consists of ~20% of international students, most of whom come from Southeast Asia.

21.

22.

( 請勿在此作答 )

23.

24.

25.

**Part 4. (30 points) Read the articles and choose 1 correct answer to each question. Each question is worth 3 points.**

Article "Status and perspectives on 100% renewable energy systems," K. Hansen et al. / Energy 175 (2019) page 471-480.

Climate action is urgent as presented by the IPCC's Special report on 1.5 °C global warming stating that climate change impacts are worse than expected [1]. In 2017, human-induced warming reached approximately 1 °C above pre-industrial levels, leading to severe climate change impacts. Changes are therefore required. The Paris Agreement of 2015 presents global ambitions to achieve a balance between anthropogenic emissions by sources and removals of sinks of greenhouse gases in the second half of this century. The ambition in the agreement is to maintain the increase in global average temperature to well below 2 °C above pre-industrial levels and pursue efforts to limit the temperature rise to 1.5 °C [2]. The total cumulative emissions up to that time represent a key to achieving this target and it has been estimated that stabilizing atmospheric greenhouse gas concentrations would result in continued warming [1,3].

One solution to meet these ambitions is to reduce the emissions from fossil fuels by deploying large-scale renewable energy (RE) supply in energy systems. This corresponds to UN's Sustainable Development Goal no. 7 working for affordable and clean energy for all with the aim to substantially increase the share of renewable energy in the global energy mix by 2030 [4]. Moreover, 100% renewable energy systems could also contribute to the fulfilment of Sustainable Development Goals no. 6 (clean water and sanitation), no. 9 (industry, innovation and infrastructure), no. 11 (sustainable cities and communities), no. 12 (responsible production and consumption) and no. 13 (climate action).

This paper focuses on the state of research within high-renewable energy systems to accommodate these ambitions and combat climate change.

In recent years, renewable solar photovoltaics (PV) and wind energy technologies have experienced radical cost reductions. PV account for the highest change in cost [5] due to improved efficiencies, material costs, economies of scale as well as public and private R&D [6,7]. The PV cost reduction trends are expected to continue further in the future [8] and similar trends can be found for wind power technologies and CSP [9]. Several studies conclude that wind and PV technologies are cost-competitive with traditional fossil fuel energy generation costs today [10-13].

Currently, the 100% RE concept is gaining momentum among a variety of stakeholders. Examples exist in Sweden where the ambition is to achieve zero net emissions of greenhouse gases by 2045 [14] and in Denmark where the target is to achieve zero net emissions by 2050 at the latest [15]. Furthermore, numerous countries

aim at 100% renewable electricity by 2045 or 2050 including Bangladesh, Barbados, Cambodia, Colombia, Ethiopia, Ghana, Mongolia, Vietnam, Hawaii and California [16]. Already today, a few countries supply almost all electricity from renewable sources (mainly hydropower) such as Norway and Costa Rica [16], whereas some countries, such as Uruguay, have been the first to achieve this target in a mix of renewables [17]. Similarly, several cities have committed to 100% renewable energy by 2050 for the total energy consumption. These cities include Copenhagen in Denmark (2050), Frankfurt and Hamburg in Germany (2050), Malmö and Växjö in Sweden (2030), Oxford Country in Australia (2050), Vancouver in Canada (2050) and The Hague in The Netherlands (2040) [16]. A similar trend exists among larger companies such as IKEA, BMW and Walmart and technology companies such as Google, Apple, Sony, eBay and Facebook among many others, and even the first company from the inner core of the fossil energy business, Wärtsilä, that has committed to 100% renewable electricity [18].

26. "anthropogenic" means?

- a. Suitable for survival of ants
- b. Regrettable
- c. Produced by human
- d. None of the above

27. "The ambition" in the Paris Agreement is?

- a. Maintain the global average temperature below certain level to well below 2 °C above pre-industrial levels
- b. Maintain the global average temperature below certain level to below 1.5 °C above pre-industrial levels
- c. Achieve a balance between greenhouse gas emissions and removals
- d. All of the above

28. "UN's Sustainable Development Goals" include:

- a. climate action
- b. clean water and sanitation
- c. to reduce the emissions from fossil fuels by deploying large-scale renewable energy (RE) supply in energy systems
- d. All of the above

29. According to the article, PV technology

- a. accounts for the highest cost of renewable energy.
- b. can achieve cost reduction by producing more PV products.
- c. Can achieve cost reduction by using quantum mechanics.
- d. None of the above.

30. "Wärtsilä" is more likely in the business of

- a. Restaurant service.
- b. Financial service.

- c. Retailing.
- d. Natural gas exploration.

31. According to the article, which country is not mentioned to have a 100% renewable electricity?

- a. The United States of America.
- b. People's Republic of China.
- c. Taiwan.
- d. All of the above.

32. "That wind and PV technologies are cost-competitive with traditional fossil fuel energy generation costs today" is?

- a. by now a universally accepted truth.
- b. will be a fact by 2030 the earliest.
- c. a conclusion if you talk to the right people.
- d. None of the above.

33. 100% renewable electricity

- a. is slated to be accomplished by some countries by 2030.
- b. is already achieved by some countries in 2019.
- c. is pursued by some companies and municipalities.
- d. All of the above.

34. According to the article, renewable energy includes

- a. CSP
- b. hydropower
- c. photovoltaics
- d. All of the above.

35. "Stabilizing atmospheric greenhouse gas concentrations" will lead to

- a. global average temperature below certain level to well below 2 °C above pre-industrial levels
- b. global average temperature below certain level to 2 °C below pre-industrial levels
- c. global average temperature continuously rising, probably over 2 °C above pre-industrial levels
- d. None of the above.

**Part 5. (20 points) Writing assignment**

In 100-200 words, write an essay to recommend any renewable energy policies, technological applications, and/or future research based on the information in the Article in Part 4. A perfect score will be given if:

- There are clear topic sentences. (2 points)
- There are substantial details supporting the topic sentences. (5 points)
- The writing includes the findings in this paper appropriately. (5 points)
- The student uses correct grammar and spelling. (5 points)
- The student uses appropriate vocabulary. (3 points)