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1

Science and Technology

科學科技

第壹部分：選擇題（占 62 分）

一、詞彙題（占 10 分）

- _____ 1. Being annoyed by many silent calls in the middle of the night, Mandy decided to trace the phone number so as to put an end to such _____.
- Ⓐ harassment Ⓑ confession Ⓒ sovereign Ⓓ auction
- _____ 2. Dams serve various functions, one of which is to _____ water flow.
- Ⓐ maintain Ⓑ originate Ⓒ regulate Ⓓ drown
- _____ 3. The writer won international fame with the _____ of his bestseller.
- Ⓐ expansion Ⓑ publication Ⓒ reunion Ⓓ calculation
- _____ 4. The food was carefully _____ and found to be contaminated with bacteria.
- Ⓐ analyzed Ⓑ removed Ⓒ described Ⓓ injected
- _____ 5. The project has _____ a lot of attention and discussion around the world.
- Ⓐ risen Ⓑ reassured Ⓒ arisen Ⓓ aroused
- _____ 6. Smartphone is a _____ invention. It has changed how the world communicates.
- Ⓐ fragrant Ⓑ revolutionary Ⓒ sanitary Ⓓ sneaky
- _____ 7. Research suggests that chemicals in blueberries can help our brains work more _____ and boost brain function.
- Ⓐ scientifically Ⓑ efficiently Ⓒ proficiently Ⓓ sufficiently
- _____ 8. You must take the necessary _____ when dealing with chemicals in the lab.
- Ⓐ initiative Ⓑ precautions Ⓒ advantage Ⓓ delight
- _____ 9. Cloning is an artificial process of producing an organism which is genetically _____ to another one.
- Ⓐ committed Ⓑ reliable Ⓒ identical Ⓓ fabulous
- _____ 10. The world changes rapidly, therefore we have to _____ ourselves with a lot of knowledge and skills for the future.
- Ⓐ resist Ⓑ approve Ⓒ invade Ⓓ equip

二、綜合測驗 (占 10 分)

11. - 15. 題為題組

Stories about teens being bullied via email or social media sites have filled the news. But 11., now we have an anti-bullying app available that will get teenagers to stop and think about their words before posting it. The person behind it is a high school student, Trisha Prabhu. With both her parents being in computer science, Prabhu has been a science nerd 12.. When she was in elementary school, she already knew how to code and design apps. When she was 13, she read about a 12-year-old girl who committed suicide after being cyberbullied for 18 months. Prabhu was 13. shocked 13. she decided to take action to help stop bullying—by researching about the science behind this behavior. She learned that teens' brain is like a car with no brakes, and it 14. her that this is connected with social media abuse. Using her talents, Prabhu came up with Rethink, an app that looks at social media sites such as Facebook and Twitter and picks out words that are considered hateful. Then a pop-up comes onto the screen, which asks the user 15. they are sure to send the message or rethink their actions. Prabhu tested her app on 300 students. “The overall willingness to post an offensive message drops from 71% to 4%,” said Prabhu. The app has saved many victims of bullying.

- _____ 11. **A** gradually **B** needlessly **C** thankfully **D** contrarily
_____ 12. **A** themselves **B** himself **C** itself **D** herself
_____ 13. **A** so ~ that ~ **B** just as ~ as ~ **C** not ~ until ~ **D** not only ~ but ~
_____ 14. **A** depended on **B** dawned on **C** went out to **D** adapted to
_____ 15. **A** that **B** how **C** whenever **D** whether

16. - 20. 題為題組

Imagine that you are surrounded by a world of talking things. Cows may transmit their physical conditions. Cars can communicate low oil levels. Airplanes are able to self-track and schedule their own maintenance 16.. All these amazing scenarios are made possible by fastening a small sensor embedded with an IP address to an object, 17. the object to “talk” to the internet. With a smart meter installed in your home to monitor energy usage 24/7, you can even observe energy price changes 18. and thus adjust your habits.

In a sense, the Internet of Things (IoT) benefits consumers a lot. For example, owners of the Tesla Model S electric car can just 19. while the company performs a wireless update “over the air,” saving them a trip to the dealer. Advocates for the IoT view Tesla’s remote fix as a sign of things to come. However, critics fear that IoT-supported gadgets will become pieces of waste 20. their manufacturers’ failure to provide long-term software updates. Perhaps time will tell if the IoT is here to stay or just another passing fad.

_____ 46. Which of the following is NOT true?

- Ⓐ Environment plays a role in inheritable variation.
- Ⓑ The idea of modification was first proposed by Darwin.
- Ⓒ Cells with the same DNA may have different characteristics.
- Ⓓ The ability of plants to transform light into sugar can be explained by the idea of natural selection.

第貳部分：混合題（占 10 分）

47-50. 題為題組

One of the things that tourists may notice everywhere in Japan is vending machines. With more than five million in active service, it is never difficult to see how much Japanese people rely on the convenience that vending machines provide.

Vending machines have a long history in Japan, but it was not until 1924, when Nakayama Koichirou invented a machine selling “drinks and snacks,” that the popularity of vending machines started to take off. Yet Nakayama’s invention is not the first of the sort. Decades before that, Tawaraya Koshichi invented the first patented vending machine in Japan, which dispensed stamps and postcards. Tawaraya built this stamp and postcard dispenser based on his previous model, a tobacco selling machine. It was designed 20 years earlier, and was the oldest vending machine recorded in Japanese history. In 1950, a “Fountain-style Juice Dispenser” was invented, which later invited many beer companies to follow suit and join the vending machine business. The number of vending machines reached one million in 1970, and the figure has gone all the way up ever since.

Reasons for the popularity of vending machines in Japan are manifold. In other countries, for example, vending machines are only placed indoors for safety reasons. In Japan, however, the low crime rates ensure that vending machines can be placed outdoors. This has greatly increased the machines’ availability and the number of users expands as a result. Besides, the large circulation of coins beginning in 1967 made it possible for the Japanese to use vending machines more casually and frequently. Another reason that explains the popularity of vending machines in Japan is because of the closeness Japanese people feel towards robots. This is clearly shown in Japanese animation such as *Astro Boy* and *Doraemon*, and most Japanese do not mind buying goods or receiving services from vending machines, an extended form of robots.

Nowadays, Japan tops the world with its amazing use and heavy reliance on vending machines. Creative and even bizarre machines are always on the way. It is thus safe to say that Japan is indeed the “King of Vending Machines.”

47. Your grandpa recalled buying cigarettes from a new type of vending machine in Japan. Who most likely invented the one he mentioned? (簡答，2分)

48. Please arrange the following machines in the correct time order. (排序, 4分)

- Ⓐ Tobacco Dispenser.
- Ⓑ Drinks and Snacks Dispenser.
- Ⓒ Fountain-style Juice Dispenser.
- Ⓓ Stamps and Postcards Dispenser.

_____ → _____ → _____ → _____

49-50 請根據選文內容, 選出適當單詞 (word) 填入下列句子的空格, 並視語法需要作適當的字形變化, 使句子語意完整、語法正確, 且符合全文文意。(填空, 4分)

One reason that vending machines are prevalent in Japan is due to the 49. _____ relationship between the Japanese and robots. Generally speaking, Japanese people feel at ease to purchase from vending machines, which can be taken as an 50. _____ of robots.

第參部分：非選擇題 (占 28 分)

一、中譯英 (占 8 分)

說明：將下列兩句中文翻譯成適當之英文, 未按題意翻譯者, 不予計分。

1. 近幾年, 人工智慧伴隨著其他智能科技, 已經進入家庭和許多產業中。

2. 可預見的是, 我們能和機器人交朋友分享心情的日子不遠了。

二、英文作文 (占 20 分)

說明：1. 依提示寫一篇英文作文 2. 文長至少 120 個單詞 (words)

【提示】下學期將舉行一場科學比賽或社會專題研究的專題競賽, 你計畫約朋友 Christ 組隊參加。請寫一封英文信函, 內容分兩段: 第一段解釋邀請他的理由, 第二段則說明這個小組將進行的事宜安排。文末署名請一律用 Francis。

詳答參見詳解本 P.1

1 科學科技

• 請參見題本 P.1

1. A 2. C 3. B 4. A 5. D 6. B 7. B 8. B
9. C 10. D 11. C 12. D 13. A 14. B 15. D 16. D
17. B 18. C 19. D 20. A 21. I 22. D 23. F 24. E
25. H 26. G 27. C 28. J 29. B 30. A 31. D 32. C
33. B 34. E 35. C 36. A 37. A 38. D 39. A 40. B
41. C 42. A 43. C 44. B 45. C 46. B
47. Tawaraya Koshichi 48. A ; D ; B ; C
49. close 50. extension

第壹部分：選擇題

一、詞彙題

1. 夜半時分，曼蒂深受多通無聲電話的干擾，她決定追蹤電話號碼以終止這種騷擾。
A 騷擾 B 告解 C 君主 D 拍賣
2. 水壩具備多種功能，其中一個是調節水流量。
A 維持 B 起源 C 規範、調節 D 使溺水
3. 這名作者因書籍出版暢銷而揚名國際。
A 擴大 B 出版 C 重聚 D 計算
4. 食物經過仔細分析後，發現受到細菌汙染。
A 分析 B 將～移走 C 描述 D 注射（藥液）
5. 這項計畫已在全世界引發許多關注和討論。
A 升起的 B 確保 C 上升 D 引起
6. 智慧型手機是革命性發明，改變了全世界的溝通方式。
A 芳香的 B 革命性的 C 衛生的 D 偷偷的
7. 研究顯示藍莓中的化學物質能幫助大腦更有效率地運作並提升大腦功能。
A 科學地 B 有效率地 C 精通地 D 充足地
8. 在實驗室處理化學藥品時，必須採取必要的預防措施。
A 主動 B 預防措施 C 優點、優勢 D 愉快
9. 生物複製是指以人工製造生物的過程，而該生物的遺傳基因與另一個生物完全相同。
A 做出承諾的 B 可靠的 C 相同的 D 絕妙的
10. 世界瞬息萬變，因此為了我們的未來，必須使自己具備大量知識與技能。
A 抵抗 B 贊成 C 侵略 D 裝備

二、綜合測驗

11. A 逐漸地 B 不必要 C 幸虧 D 相反地
12. 這裡的反身代名詞修飾主詞 Prabhū，因此用 herself。
13. A 如此～以至於～ B 正如同～一樣～
C 直到～才～ D 不只～而且～
14. A 依賴 B 頓悟 C 同情 D 適應
15. whether A or B 要 A 或者是 B

中譯 & 字詞提示

新聞中不乏青少年透過電子郵件或社群媒體網站霸凌他人的報導，值得慶幸的是，反霸凌的應用程式已然誕生，

讓青少年在發布（霸凌）言論前先停下來想想。應用程式的發明人是一位高中生——崔夏·普拉布。她的父母都是從事電腦科學研究，所以普拉布本身就是個科學狂。她上小學時，就知道如何編寫和設計應用程式。當她十三歲時，她得知一名十二歲的女孩在受到網路霸凌十八個月後自殺的消息，普拉布非常震驚，決定採取行動，希望藉由研究這種行為的科學因素來制止霸凌。當她了解青少年的大腦就像一輛沒有剎車的汽車，她突然意識到這與社群媒體的濫用有關。普拉布運用她的才能，創造出 Rethink 這個應用程式，可以查看臉書和推特等社群媒體網站，並挑出帶有惡意的詞彙。螢幕會彈出警示視窗，詢問用戶是否確定發送訊息或重新思考這個行為。普拉布對三百名學生進行測試，她說：「發布攻擊性訊息的整體意願從百分之七十一下降到百分之四。」該應用程式拯救許多深受霸凌的受害者。

available *adj.* 可取得的；nerd *n.* 狂熱分子、書呆子；code *v.* 為～編碼；commit suicide 自殺；cyberbully *v.* 網路霸凌；brake *n.* 煞車；abuse *n.* 濫用；pop-up *n.* 彈出式視窗；offensive *adj.* 攻擊性的

16. A 在手邊 B 故意地 C 如定義般 D 如果需要
17. allow N to V 允許 N 做某事。make 和 let 後接原 V。
18. A 在心中 B 順道一提 C 即時（電腦同步） D 隨機
19. A 靜坐示威 B 熬夜 C 袖手旁觀 D 舒服坐著休息
20. A 由於 B 除了 C 儘管 D 以及

中譯 & 字詞提示

想像自己處在萬物都會說話的世界：乳牛能傳達身體狀況，汽車能通報油位太低，如果需要，飛機能自我追蹤並安排維護時程。透過將設有網路位址的小型感應器裝在物體上，讓物體與網際網路「對話」，這些驚人的情節都可以實現。透過安裝在家中的智能電表可以全天候監控能源使用狀況，甚至可以即時觀察能源價格變化，從而調整使用習慣。

某種意義上而言，消費者從物聯網（IoT）受益匪淺。例如，特斯拉 S 型電動車的車主只需舒服地坐著，汽車公司就會透過無線下載技術進行「無線」更新，車主可以省下跑一趟經銷商的行程。物聯網的支持者認為特斯拉的遠端修復是未來趨勢的標誌。然而，批評者擔心物聯網支援的配件將成為廢棄零件，因為製造商可能無法提供長期軟體更新。也許時間能夠證明，物聯網究竟會繼續發展或只是另一種短暫的風潮。

surround *v.* 圍繞；transmit *v.* 傳輸；maintenance *n.* 維修；scenario *n.* 情節；sensor *n.* 感應器；embed *n.* 設置、嵌入；meter *n.* 儀表；install *v.* 安裝；monitor *n.* 監控；adjust *v.* 調整；dealer *n.* 經銷商；advocate *n.* 擁護者；gadget *n.* 小機件；fad *n.* 一時流行

三、文意選填

21. 本題格前為形容詞，判斷此格需填入名詞，依照本句句