

國立清華大學 103 學年度碩士班考試入學試題

系所班組別：資訊系統與應用研究所

考試科目（代碼）：英文 (2202)

共 6 頁，第 1 頁 *請在【答案卷】作答

Part 1: (20%) Fill in the blanks in the following sentences with the most suitable words from those listed in the following table.

| | | | |
|----------------|---------------|------------|--------------|
| duration | bought | bear | showed off |
| unavoidable | outbreaks | brought | coincidence |
| probability | curriculum | transcript | longitudinal |
| look after | permanent | showed up | gadgets |
| capitalization | look into | bearing | centers |
| exploitation | slope | temporary | houses |
| apparently | approximately | produces | conflict |

1. Winter storm Hercules has _____ blizzard-like conditions across the US east coast with up to two feet of snow seen in some parts of the country.
2. With Americans now more likely to have a smartphone or Wi-Fi network to call their own, the Internet of things is getting closer to _____ fruit.
3. There are dozens of wearable fitness _____ on the market that monitor our activity.
4. Despite several damaging tornado _____ in 2013, last year actually had the fewest number of twisters—about 900—since 1989.
5. You might think it'd be in Beijing or Shanghai, but the National Palace Museum in Taipei _____ the largest collection of Chinese artifacts and artwork in the world.
6. Kate Middleton and her husband Prince William are reportedly shopping for a nanny to _____ their son, Prince George during their upcoming visit to Australia and New Zealand.
7. We also confirmed negative effects of TV viewing on verbal intelligence quotient (IQ) in cross-sectional and _____ analyses.
8. Seven years in the making, the so-called Red Bull Stratos Mission to the Edge of Space is expected to break records as the highest, fastest, and longest-_____ skydive.
9. Hundreds watched Yuan Zai's first appearance as she _____ her climbing skills on logs and trees, before crawling off to nap with her mother.
10. China's State Council, or cabinet, said last year that "concentrations of fine particles" in the capital's air would fall by _____ 25 percent from 2012 levels by 2017.

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Part 2: (15%) For the following questions, choose the underlined part of the sentence that contains a grammatical or usage error and correct the error to make the sentence correct. If there is no error, choose answer E.

11. On Monday, Jonathan signed the bill, which was passed by the national assembly

A B C

in May, and contains harsh penalties for homosexual activity and membership in

gay rights groups. No error.

D E

12. After the director and assistant director both resigned, we all wondered who will

A B C

be appointed to fill their positions. No error.

D E

13. The love seat is now being installed in some New York movie theaters, giving

A B

couples the option of lifting the arm between the seats to create a more cozier

C D

viewing experience. No error.

E

14. All employees with two years' experience entitled to full benefits, including health

A B C D

insurance, life insurance, a retirement plan, and stock options. No error.

E

15. The Air Force said a small number of staff had been texting answers to the

A B

routine tests to others, however others had known but failed to report it. No error.

C D E

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Part 3: (35%) Read the following article and answer the questions after this article using FULL SENTENCES in ENGLISH.

Is It Fair to Steer Students into STEM Disciplines Facing a Glut of Workers?

The argument over whether or not there is a shortage of qualified STEM workers was replayed once more in a story this past week in a *Chronicle of Higher Education* article titled, "The STEM Crisis: Reality or Myth." Unfortunately, you need to be a subscriber to gain full access to the article, but I thought a few quotes from the usual suspects claiming there is a STEM crisis in the United States would be enlightening.

For example, there's Robert D. Atkinson, president of the Information Technology & Innovation Foundation (ITIF), which receives a lot of its funding from high-tech companies. ITIF vehemently insists that the STEM crisis is real and that anyone who says differently is hopelessly misguided and uninformed. Atkinson argued that, among other things, college students need to be channeled towards "more useful" majors.

"We should be making some value judgments on what kind of people we'll need for the nation to move forward...The distribution of degrees right now is entirely up to students. Shouldn't we be steering them into degree types that are of more value to society, such as computer science or engineering? The American tradition is one of hard-core pragmatism. We're at risk of losing that, and we're in trouble now in regards to competitiveness."

Atkinson goes on to imply that IT workers in the U.S. will just have to get accustomed to lower wages given that, "Companies can go overseas for workers." Of course, the ITIF is a strong supporter of expanding the H-1B visa program for its high-tech paymasters, which has helped erode STEM wages, especially for engineers. Additionally, Atkinson maintains that, "there will be work in IT for people with the right set of skills...[and] that lower wages probably won't keep them from accepting jobs."

I would bet, however, it might discourage many potential engineering and computer students from pursuing those careers, as it has in the past.

The *Chronicle* article goes on to quote Anthony Carnevale, a research professor and director of Georgetown University's Center on Education and the Workforce, who also insists that there is a STEM student/worker shortfall (but who also once in a moment of

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candor admitted that any college student with math talent would be “crazy to go into STEM”). However, in the *Chronicle* article, Carnevale reasons that even if there is a *glut of STEM graduates* moving into the workforce, that’s okay because STEM grads “do better than other types of majors and tend to move into management pretty quickly.”

There's nothing like hedging your bets. In fact, Carnevale continues:

“Having experience in technical matters helps them [STEM students] land good non-STEM jobs. They might work in places like marketing or medical-device sales, where their technical backgrounds helped them get in.”

Yep, get an EE or CS degree, and you too can strive to get a job shilling medical devices. Sounds to me like a winning slogan for convincing high-school students to pursue engineering or similar STEM majors. Maybe Carnevale can make up posters and send them to all the high schools to put up in their science and math classrooms.

On another related note, last week I had the opportunity to attend a Congressional briefing hosted by IEEE-USA and the AFL-CIO (a federation of trade unions in the United States) on the impact of the H-1B visa program on the economy, innovation, and the workforce. The panel was moderated by Ron Hira, associate professor of public policy at the Rochester Institute of Technology, and included Neeraj Gupta, CEO of Systems in Motion; Karen Panetta, professor of electrical and computer engineering at Tufts University and editor and chief of *IEEE Women in Engineering* magazine; and Hal Salzman, professor of public Policy at Rutgers University. The briefing drew a standing-room only crowd of House of Representatives staffers.

Hira provided a quick overview of the current H-1B visa program, and highlighted the fact that no one knows (or tracks) exactly how many H-1B visa holders there are in the U.S. He estimated that the total is around 650 000, with most working in the high tech arena. Hira also reported that the program does not require U.S. companies to actively recruit U.S. workers before seeking out H-1B visa workers, and that company compliance with the H-1B visa requirements is only maintained through whistle blowers such as Jay Palmer, who exposed Indian outsourcing company Infosys’s rampant abuse of the program. Palmer was supposed to attend the briefing to describe his Infosys experience, but unfortunately, his flight was canceled.

Gupta, who came to the United States as a student, was hired under an H-1B, and later

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became a U.S. citizen, talked (ironically) of the difficulty he faces as the CEO of a growing IT services company competing against H-1B outsourcers. He emphasized that H-1B workers are hired by U.S. companies as well as Indian and other foreign outsourcing companies primarily to lower their labor costs using mostly high-tech workers with average skills. Gupta argued that the H-1B program needs to return to its original purpose, which was to bring the truly best and brightest from across the world, *not just primarily India*, to work in the United States. This is not likely to happen, since the world's truly “best and brightest” are not likely to sign up to be treated as high-tech “indentured servants” as many H-1B visa holders do.

Salzman spoke of the latest data on STEM graduates and jobs, reiterating that STEM programs turn out at least 50 percent more IT graduates every year than there are U.S. job openings. He also said that if the H-1B program is ramped up to the numbers that are being advocated (up from 85 000 to 185 000), that worker oversupply could possibly increase to the 90 percent mark or more. *Salzman called attention to Georgetown University's report earlier this year that showed recent information system majors had a 14.7 percent unemployment rate, the highest of the majors it tracks.* Even contemporary computer science graduates were experiencing an 8.7 percent unemployment rate.

Well, there are always those jobs selling medical devices.

Panetta noted that expansion of the H-1B visa program has had the effect of keeping down the already small numbers of women and minorities getting computer science and computer engineering degrees, since the more visa holders there are, the fewer job opportunities are available for U.S. workers. She also noted that only a small proportion of H-1B visas is given to female STEM graduates, even though 40 percent of the STEM graduates in India are women (this is more than double the U.S. percentage, she said). Panetta also noted how U.S. STEM students are facing school loan debts which are discouraging many to pursue graduate studies, a problem many foreign STEM students don't have.

You can read more about the H-1B briefing in a *Computer World story* as well.

Coincidentally, a few hours after the panel briefing, House Speaker John A. Boehner announced that full immigration reform would not happen this year. Boehner wouldn't indicate whether it might be looked into again in 2014. While it may look like the H-1B visa cap will remain at 85 000 for the foreseeable future, President Obama signaled

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yesterday that he is open to “piecemeal” immigration legislation. This means that the H-1B cap may in fact be raised sooner than later, which would make Facebook and other tech companies very happy.

However, with CIO’s indicating that a slowdown in IT hiring may be in store for 2014, there seems little need for raising the H-1B cap anytime soon if ever.

(Extracted from IEEE Spectrum Magazine, Posted 21 Nov 2013 | 20:00 GMT)

Answer the following questions using FULL SENTENCES in ENGLISH.

16. (8%) According to this article, what does “STEM” represent for?
17. (6%) What are the positions of Ron Hira, Neeraj Gupta, and Anthony Carnevale, respectively?
18. (6%) Does Anthony Carnevale support or discourage STEM majors? Why?
19. (15%) Based on the title of this article and the contents, do you think that USA really lacks of STEM workforce? Give your reasons and discussion in no more than 100 words.

Part 4: (30%) Translate the following Chinese paragraphs to English.

20. (15%) A 公司昨日宣布更新其軟體的雲端程式服務，此服務可提供 3D 列印功能，允許使用者能夠建置、預覽，並列印 3D 設計。A 公司發言人表示，新的 3D 列印功能讓用戶能夠在其軟體中直接以 3D 設計，或是修改既有的 3D 模型，以熟悉的軟體工具來打造漂亮且可直接列印的 3D 模型。
21. (15%) 行動裝置應用發展至今，如何適當地使用它已經成為企業管理決策的兩難，一方面企業確實可以利用行動裝置帶來的便利與好處，大幅提升協同作業的效率，然而，另一方面卻可能因此讓資訊安全陷入新的挑戰。尤其，行動裝置應用的軟硬體，都還在持續且快速發展中，控管策略必須不斷檢視，才能對公司的資訊安全做到最佳的防護。