

臺灣綜合大學系統 111 學年度學士班轉學生聯合招生考試試題

科目名稱	國文	類組代碼	共同考科
		科目碼	E0001

※本項考試依簡章規定所有考科均「不可」使用計算機。

本科試題共計 **3** 頁

一、單選題 (60%，每題 3 分)

1. 下列各組「」內的字音，前後不同的選項是：

- (A) 若「埕」若穴／「喋」血山河 (B) 交「戟」之衛士／王俱與「稽」首
 (C) 西方有木焉，名曰「射」干／每公卿入言，賓客上「謁」
 (D) 不知軍之不可以退而謂之退，是謂「縻」軍／侶魚蝦而友「麋」鹿

2. 下列「」內的字，讀音前後相同的是：

- (A) 既瘡且「痺」／彈箏搏「髀」 (B) 不「忤」不求／「度」藏字畫
 (C) 「攢」蹙累積／踰牆「鑽」穴 (D) 「剜」肉補瘡／壯士斷「腕」

3. 下列三首詩歌所詠之物，依序是：

- 甲、解落三秋葉，能開二月花。過江千尺浪，入竹萬竿斜。
 乙、大漠沙如雪，燕山月似鉤。何當金絡腦，快走踏清秋。
 丙、人間植物月中根，碧樹分敷散寶熏。自是莊嚴等金粟，不將妖艷比紅裙。

- (A) 風／馬／桂 (B) 風／駱駝／菊 (C) 雨／馬／菊 (D) 雨／駱駝／桂

4. 王勃〈滕王閣〉詩：「閒雲潭影日悠悠，物換星移幾度秋」。下列選項，何者意思與「物換星移」之意相反？(A) 江山如故 (B) 時移事往 (C) 滄海桑田 (D) 時過境遷

5. 下列文句，完全沒有錯別字的是：

- (A) 及時新聞報導新冠肺炎疫情 (B) 口罩已成為不可獲缺的物資
 (C) 民眾不明就裡搶購民生用品 (D) 政府呼籲切勿輕信流言斐語

6. 孟子：「愛人不親，反其仁；治人不治，反其智；禮人不答，反其敬。」文中所說的道理是：(A) 對症下藥 (B) 正本清源 (C) 以德報怨 (D) 責躬省過

7. 「有一個詩人說：『如果我不來，這一山野花都白開了。』花開了，又謝了，落在泥土裡腐爛了，而山上只有牛羊走過，老鷹飛過，那教花兒怎麼忍受——作家來了，他觀察這些花，產生意象，這些花就可能永遠不凋謝，價值也可能不只是一些花。」根據文意，下列選項何者錯誤？

- (A) 作家是生命力的見證人，美的發現者
 (B) 作家運用細微的觀察力，是為了增強寫作技巧
 (C) 作家將美好的所見記錄下來，使它們不被時間毀滅
 (D) 作家觀察自然萬象，能藉由產生的意象賦予永恆的生命

8. 《論語·述而》：「與其進也，不與其退也；與其潔也，不保其往也。」其中「與」字，意義與下列何者相同？

- (A) 微斯人，吾誰與歸 (B) 夫子喟然嘆曰：吾與點也
 (C) 禮，與其奢也，寧儉 (D) 舜禹之有天下也，而不與焉。

9. 曾國藩〈原才〉：「風俗之厚薄奚自乎？自乎一、二人心之所嚮而已。」下列與此旨意不同的選項是：

- (A) 政者，正也。子帥以正，孰敢不正（《論語·顏淵》）
 (B) 舉直錯諸枉，則民服；舉枉錯諸直，則民不服（《論語·為政》）
 (C) 君子之德，風；小人之德，草。草上之風，必偃（《論語·顏淵》）
 (D) 君子篤於親，則民興於仁；故舊不遺，則民不偷（《論語·泰伯》）

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10. 唐代書法大家張旭：「始吾見公主擔夫爭路，而得筆法之意，後見公孫氏舞劍器而得其神。」自道其創作經驗，頗為得意。就專業學習的精進歷程，下列選項，最符合題意的是：
 (A)創新要淨空一切，丟棄原有的基礎 (B)生活中無關專業的，皆可摒除身外
 (C)跨領域是一好方法，可激盪出新意 (D)體悟不分層次高低，收穫但有優劣
11. 下列文句□內的用字若完全正確，則□中應填入的字依序是：
 「這件□受矚目的案子，先前媒體所以□而不宣，是因為當事人是名門□族。但紙終究包不住火，在諸多證據對他不利的情況下，他也無法再□高氣昂地否認。」
 (A)被／秘／旺／指 (B)備／密／旺／趾 (C)被／密／望／指 (D)備／秘／望／趾
12. 清初金聖嘆在傳統經典書目之外，另列出「六大才子書」。以下何者不在「六大才子書」之列？(A)西廂記 (B)莊子 (C)史記 (D)左傳
13. 下列是一段評論〈擣衣〉詩的文字，依文意選出排列順序最恰當的選項：
 〈擣衣〉清而徹，有悲人者。此是
 甲、內外相感，愁情結悲 乙、秋士悲於心 丙、然後哀怨生焉 丁、擣衣感於外
 苟無感，何嗟何怨也！（蕭繹《金樓子·立言篇》）
 (A)乙丙丁甲 (B)乙丁甲丙 (C)丁甲乙丙 (D)丁丙乙甲
14. 桃花因顏色鮮豔美麗，故詩人藉以比喻美麗的女子。下列詩歌中的桃花，不具此喻意的選項是：
 (A)一夜清風動扇愁，背時容色入新秋。桃花眼裡汪汪淚，忍到更深枕上流
 (B)每坐臺前見玉容，今朝不與昨朝同。良人一夜出門宿，減卻桃花一半紅
 (C)淺色桃花亞短牆，不因風送也聞香。凝情盡日君知否，還似紅兒淡薄妝
 (D)暮春三月日重三，春水桃花滿禊潭。廣樂逶迤天上下，仙舟搖衍鏡中酣
15. 「天行健，君子以自強不息」，強調剛健進取的精神。下列文句，最符合此種精神的選項是：
 (A)戰戰兢兢，如臨深淵，如履薄冰
 (B)非其君不事，非其民不使。治則進，亂則退
 (C)原泉混混，不舍晝夜，盈科而後進，放乎四海
 (D)可與共學，未可與適道；可與適道，未可與立；可與立，未可與權
16. 古人常有手書前人名句的習慣，下列不可能發生的選項是：
 (A)劉基手書「諮諏善道，察納雅言」
 (B)韓愈手書「蓋文章，經國之大業，不朽之盛事」
 (C)陶淵明手書「山不在高，有仙則名；水不在深，有龍則靈」
 (D)王安石手書「滄浪之水清兮，可以濯吾纓；滄浪之水濁兮，可以濯吾足」
17. 下列成語，何者可以用來形容「天將破曉」？
 (A)月明星稀(B)曉風殘月(C)華燈初上(D)日落西山
18. 請閱讀下列短詩，並為它選擇一個最恰當的題目。「山，垂一條領帶／抖著男子漢瀟灑的氣派」(A)彩虹(B)山嵐(C)溪流(D)瀑布

背面有題，請繼續作答。

臺灣綜合大學系統 111 學年度學士班轉學生聯合招生考試試題

科目名稱	英文	類組代碼	共同考科
		科目碼	E0002

※本項考試依簡章規定所有考科均「不可」使用計算機。 本科試題共計 4 頁

第一部分:請於答案卡作答

I. 綜合測驗 40% (單選題, 每題 2 分不倒扣)

1. Which of the following words in the sentence "On a warm January afternoon in Miami, Jayson Rosero sat by the pool and starred at his phone" is a misspelling as judged by the context?
(A) On (B) sat (C) starred (D) pool
2. He pregames his daily gym session with a smoothie made ____ egg whites and whey protein.
(A) from (B) of (C) up (D) into
3. Spend enough time on social media, and you'll encounter young people ____ in all sorts of schemes
(A) engage (B) engaged (C) result (D) resulted
4. It is an idea that just wouldn't _____. You need to make it more persuasive.
(A) sell (B) buy (C) believe (D) tell
5. Her father walked her down the _____ at her wedding.
(A) road (B) drive (C) lane (D) aisle
6. So much has changed over four decades, but one thing _____ largely as it was on June 30, 1982.
(A) retains (B) remains (C) differs (D) varies
7. For nearly a century, the world has been trying to _____ a limitless clean energy process called nuclear fusion
(A) envision (B) entertain (C) develop (D) make
8. As the US _____ the victims of another mass shooting, many people are left feeling hopeless and helpless.
(A) empathizes (B) condolences (C) sympathizes (D) mourns
9. The deadly mass shooting at a Texas elementary school yesterday _____ the nation grieving and in anguish—once again—about gun violence in the US.
(A) left (B) enabled (C) stimulated (D) warned
10. Growing levels of _____ and rising food prices could push as many as 263 million people into extreme poverty this year.
(A) disqualification (B) equality (C) quality (D) inequality
11. Many Americans say life has at least partially returned to a pre-pandemic normal, but experts _____ that when it comes to Covid-19, the US is not out of the woods yet.
(A) agree (B) disagree (C) warn (D) concur
12. UFO sightings have puzzled government officials and _____ for decades as many seek to answer the question: Are we alone?
(A) witnesses (B) generals (C) skeptics (D) lone wolves
13. Prices at the pump are on the _____ again.
(A) case (B) rinse (C) raise (D) rise

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14. Freightos ____ announcing its plan to go public on the NASDAQ market in the coming months.
(A) was (B) is (C) be (D) will
15. The Chinese city of Shanghai, the country's economic center and a global trade hub, has ____ Covid curbs after a two-month lockdown
(A) made (B) initiated (C) eased (D) obstructed
16. Coronavirus can cause symptoms that ____ weeks or months after the infection has gone, a condition now called "long COVID"
(A) include (B) expands (C) last (D) went on for
17. Schools must be spaces where educators and learners feel ____ and psychologically safe.
(A) physician (B) perceptually (C) physiologically (D) physically
18. One who writes plays is a ____.
(A) playwright (B) playwrite (C) playright (D) typewriter
19. Around the country, the setting for adolescent mental health care looks ever more like this doctor's office in Kentucky, the next ____ arriving every 15 minutes.
(A) statistics (B) study (C) patient (D) impatience
20. They will need to come to ____ with the fact that reducing gun violence will require more policing and incarceration, not less.
(A) terms (B) realize (C) understanding (D) acceptance

II. 克漏字 20% (單選題，每題 2 分不倒扣)

Monkeypox is a rare disease caused by the monkeypox virus. It leads to rash and flu-like 21. Like the better known virus that causes smallpox, it is classified as an orthopoxvirus. Monkeypox was 22 in 1958 when two 23 of a pox-like disease occurred in groups of monkeys being used for research. 24 its name, the monkeypox virus no longer comes from monkeys. Scientists aren't certain, but it's 25 to be spread by small rodents and squirrels in the rainforests of Africa. There are two types (strains) of monkeypox virus — Central African and West African. Central African monkeypox virus causes more severe infections and is more likely to cause death than West African monkeypox virus.

21. (A) diseases (B) monkeys (C) coronavirus (D) symptoms
22. (A) discovered (B) created (C) begun (D) influenced
23. (A) monkeys (B) boxes (C) outbreaks (D) studies
24. (A) Given (B) Despite (C) Due to (D) Consistent
25. (A) definite (B) like (C) scientifically (D) thought

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In a study published Thursday in the journal *Science*, researchers report that a process called “greening” is occurring over large swaths of the Alps. 26 this term is sometimes used to refer to 27 a space more environmentally friendly, in this case, it refers to an increase in plant growth and spread which can accelerate climate change.

Greening can potentially cause a few positive consequences, but the 28 consequences outweigh these effects, said Sabine Rumpf, the study’s first author and a professor at the University of Basel in Switzerland.

This phenomenon is occurring across 77 percent of the European Alps above the tree line — the edge of alpine habitats where trees 29 growing. An earlier 30 reported this was happening in just 56 percent of the region.

26. (A) When (B) Where (C) What (D) While
 27. (A) make (B) making (C) made (D) mark
 28. (A) negative (B) potential (C) visible (D) likely
 29. (A) continue (B) are (C) stop (D) is
 30. (A) phenomenon (B) official (C) estimate (D) problem

III. 閱讀測驗 20% (單選題，每題 2 分不倒扣)

Two days after the massacre of children in Uvalde, Texas, and 12 days after the racist mass killing in Buffalo, Chenxing Han, a chaplain and teacher, told a Buddhist parable.

A man is shot with a poisoned arrow, Ms. Han recounted as she drove a group of high school seniors to visit a Thai temple in Massachusetts.

The arrow piercing his flesh, the man demands answers. What kind of arrow is it? Who shot the arrow? What kind of poison is it? What feathers are on the arrow, a peacock’s or a hawk’s?

But all these questions miss the point, the Buddha tells his disciple. What is important is pulling out that poison arrow, and tending to the wound.

“We need to be moved by the pain of all of the suffering. But it is important that we are not paralyzed by it,” Ms. Han said. “It makes us value life because we understand life is very precious, life is very brief, it can be extinguished in a single instant.”

Recent days have revealed an arrow lodged deep in the heart of America. It was exposed in the slaughter of 19 elementary school children and two teachers in Uvalde, and when a gunman steeped in white supremacist ideology killed 10 people at a Buffalo supermarket. The United States is a nation that has learned to live with mass shooting after mass shooting.

And there are other arrows that have become subsumed into everyday life. More than one million people have died from Covid, a once unimaginable figure. The virus is now the third-leading cause of death, even with the availability of vaccines in one of the most medically advanced countries in the world. An increase in drug deaths, combined with Covid, has led overall life expectancy in America to decline to a degree not seen since World War II. Police killings of unarmed Black men continue long past vows for reform.

The mountain of calamities, and the paralysis over how to overcome it, points to a nation struggling over some fundamental questions: Has our tolerance as a country for such horror grown, dusting off after one event before moving on to the next? How much value do we place in a single human life?

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31. Which of the following is NOT synonymous with the word *parable*?
 (A) lesson (B) paraphrase (C) story (D) fable
32. What does the word *demand* mean in “the man demands answers”?
 (A) to ask to be informed of (B) an urgent request (C) to require or need (D) to give order
33. What does the pronoun *it* refers to in “It makes us value life ...”?
 (A) value of life (B) pain of all of the suffering (C) that we are not paralyzed (D) that we understand life.
34. What does the pronoun *it* refers to in “it can be extinguished in a single instant”?
 (A) value of life (B) pain (C) life (D) paralysis
35. What does the word *slaughter* mean?
 (A) laughter (B) slavery (C) counting (D) killing
36. Which of the following is the most likely country the author is referring to in “one of the most medically advanced countries in the world”
 (A) the UK (B) the US (C) China (D) Japan
37. What does the word *figure* mean?
 (A) picture (B) finger (C) table (D) number
38. What is the author’s attitude toward “the paralysis over how to overcome it”?
 (A) neutral (B) optimistic (C) pessimistic (D) not sure
39. What does the word *steeped* mean in “a gunman steeped in white supremacist ideology”?
 (A) soaked (B) precipitous (C) slanted (D) stepped
40. What does the word *recount* mean in “A man is shot with a poisoned arrow, Ms. Han recounted as she drove a group of high school seniors”?
 (A) to count again (B) to narrate (C) to consider (D) to repeat

第二部分:請於答案卷作答

IV. 英文寫作 20%

Given English's importance in international communication, Taiwan government is proposing a policy initiative called "Bilingual 2030" to include English as a second official language with a view to connecting Taiwan with the world. The policy, however, has met severe criticism from scholars for its potential threats to local languages and cultures. If you had the power to make the final decision about the bilingual policy, what would it be? Most importantly, what is the basis of your decision? In no more than three short paragraphs, provide your decision and its reasons.

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科目名稱	微積分 A	類組代碼	共同考科
		科目碼	E0011

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本科試題共計 1 頁

1. (10 points) For what values of a and b , $a, b \neq 0$, is the following equation true?

$$\lim_{x \rightarrow 0} \left(\frac{e^{ax} - 1}{x^2} - ax + \frac{b}{x} \right) = \frac{1}{2}$$

2. (a) (5 points) Let $f(x) = \sec^2 x$ on $(0, \frac{\pi}{2})$ and f^{-1} be the inverse function of f . Find $(f^{-1})'(4) =$ _____.

- (b) (5 points) Let $f = f(x, y)$ be a differentiable function of x and y , and let $x = rs, y = r + s$ and $h(r, s) = f(x, y) = f(rs, r + s)$. Assume $\frac{\partial f}{\partial x}(1, 2) = 2$, $\frac{\partial f}{\partial y}(1, 2) = 1$. Find $\frac{\partial h}{\partial s}(1, 1) =$ _____.

3. (10 points) If $f(x) = \int_0^{x^2} (1 - t^2)e^{t^2} dt$, on what interval(s) is f increasing?

4. (10 points) Let $a > 0$ be a constant. Evaluate

$$\int_0^a \frac{x^2}{(x^2 + a^2)^{3/2}} dx.$$

5. (10 points) Find the area of the region that lies inside the curve $r = 4 \sin \theta$ and outside the curve $r = 2$.

6. (10 points) For what real values of p does the series $\sum_{n=2}^{\infty} \frac{1}{n^p \ln n}$ converges?

7. (10 points) Let $f(x)$ be the function defined by the power series

$$\sum_{n=0}^{\infty} \frac{(x+2)^{2n}}{(n+3)!}.$$

Try to express $f(x)$ as an elementary function.

8. (10 points) Find the global maximum and global minimum of $f(x, y, z) = x^2 + y^2 + z^2$ on the surface $x^2 + 2y^2 + 3z^2 = 1$ by using the method of Lagrange multipliers.

9. (10 points) Evaluate $\iint_R \frac{y}{x} e^{xy} dA$, where R is the region in the first quadrant bounded by lines $y = x$, $y = 3x$, and the hyperbolas $xy = 1$, $xy = 3$.

10. (10 points) Evaluate the line integral $\int_C (1 - y^3)dx + (x^3 + e^{-y^2})dy$, where C is the arc of the the circle $x^2 + y^2 = 4$ traversed counter-clockwise from $(2, 0)$ to $(-2, 0)$.

臺灣綜合大學系統 111 學年度學士班轉學生聯合招生考試試題

科目名稱	普通物理 B	類組代碼	共同考科
		科目碼	E0015

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本科試題共計 3 頁

Some useful constants

Gas constant $R = 8.314 \text{ J/mol}\cdot\text{K}$

Gravitational constant $G = 6.68 \times 10^{-11} \text{ N}\cdot\text{m}^2/\text{kg}^2$

Mass of Sun $= 2.0 \times 10^{30} \text{ kg}$

Mass of Earth $= 6.0 \times 10^{24} \text{ kg}$

Radius of Earth $= 6.4 \times 10^6 \text{ m}$

Radius of Sun $= 7.0 \times 10^8 \text{ m}$

Electron mass $m_e = 9.1 \times 10^{-31} \text{ kg}$

Electron charge $e = 1.6 \times 10^{-19} \text{ C}$

Electric constant (permittivity) $\epsilon_0 = 8.85 \times 10^{-12} \text{ C}^2/\text{N}\cdot\text{m}^2$

Magnetic constant (permeability) $\mu_0 = 4\pi \times 10^{-7} \text{ T}\cdot\text{m/A}$

Plank's constant $h = 6.63 \times 10^{-34} \text{ J}\cdot\text{s}$

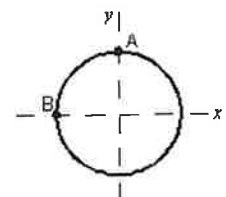
$1 \text{ eV} = 1.6 \times 10^{-19} \text{ J}$

Boltzmann constant $k_b = 1.380 \times 10^{-23} \text{ J}\cdot\text{K}^{-1}$

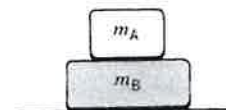
第一部分：填充簡答題 (80 分)

共 16 題，每題 5 分，請於答案卷上依序作答並標明題號 (無需詳列計算過程)。

1. A toy moves with constant speed around a circle. The radius of the circle $R=3 \text{ m}$. When the toy is at point A, its velocity is $6 \text{ m/s } \hat{i}$. When it is at point B, what is its acceleration (vector)?



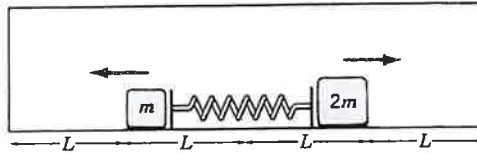
2. Block A of mass $m_A = 2 \text{ kg}$ is on block B of mass $m_B = 5 \text{ kg}$. The lower block is on a frictionless surface while the coefficient of static friction $\mu_s = 0.25$ between the two blocks. If they are moving together at constant velocity, $v=5 \text{ m/s}$, what is the frictional force between A and B?



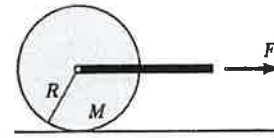
3. A particle starts from rest ($v = 0$) at time $t = 0$ and moves along the x axis. If the net force on it is proportional to t , its kinetic energy will be proportional to t^n . What is the value of n ?

4. A thin rod of length a varies in its composition in such a manner that its linear mass density is $\lambda(x) = cx$, where x is the distance from one end. Locate the position of center of mass (CM) relative to $x=0$.

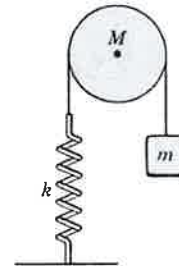
5. Two blocks of masses m and $2m$ are held against a massless compressed spring within a box of mass $3m$ and length $4L$ whose center is at $x=0$. All surfaces are frictionless. After the blocks are released they are each at a distance L from the ends of the box when they lose contact with the spring. Both blocks keeps moving until they collide with the box and stick to it. Find the distance of the center of the box moves from $x=0$ after both blocks stick to the box.



6. A lawn roller is a solid cylinder of mass M , radius R , and rotational inertia $I=MR^2/2$. It is pulled at its center by a horizontal force of magnitude F and rolls without slipping on a horizontal surface. Find the acceleration of the cylinder.



7. A block of mass m is attached to a vertical spring via a string that hangs over a pulley of mass M and radius R . The rotational inertia of the pulley $I=MR^2/2$. The string does not slip. Find the angular frequency (ω) of the simple harmonic motion.



8. The wave function of a wave is:

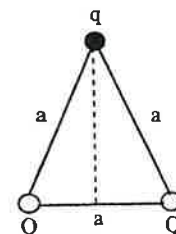
$$y(x, t) = 0.3\sin(0.4x + 40t + 0.6)$$

where x and y are in centimeters (cm) and t is in second (s). Find the wave velocity.

9. Two small charged objects repel each other with a force F when separated by a distance d . If the charge on each object is reduced to one-fourth of its original value and the distance between them is reduced to $d/2$, the force becomes: _____.

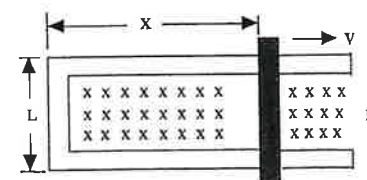
10. A conducting sphere of radius 0.01 m has a charge of 1.0×10^{-9} C deposited on it. The magnitude of the electric field in N/C just outside the surface of the sphere is: _____

11. The two charges Q are fixed at the vertices of an equilateral triangle. If $k = 1/(4\pi\epsilon_0)$, the work required to move q from the other vertex to the center of the line joining the fixed charges is: _____.



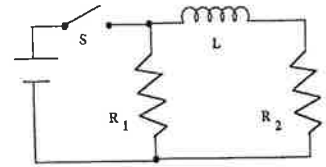
12. Two conductors are made of the same material and have the same length. Conductor A is a solid wire of diameter 1 mm. Conductor B is a hollow tube of inside diameter 1 mm and outside diameter 2 mm. The ratio of their resistance, R_A/R_B , is: _____

13. A rod with resistance R lies across frictionless conducting rails in a uniform magnetic field B , as shown. Assume the rails have negligible resistance. The force that must be applied by a person to pull the rod



to the right at constant speed v is: _____

14. When the switch S in the circuit shown is closed, the time constant for the growth of current in R_2 is: _____.



15. Consider the four Maxwell equations:

$$\text{I} \quad \int \vec{E} \cdot d\vec{A} = \frac{q}{\epsilon_0}$$

$$\text{II} \quad \int \vec{B} \cdot d\vec{A} = 0$$

$$\text{III} \quad \int \vec{E} \cdot d\vec{s} = -\frac{d\Phi_B}{dt}$$

$$\text{IV} \quad \int \vec{B} \cdot d\vec{s} = \mu_0 I + \epsilon_0 \mu_0 \frac{d\Phi_E}{dt}$$

Which of these equations would have to be modified if magnetic poles were discovered: _____?

16. A spectral line of a certain quasar is observed to be “red shifted” from a wavelength of 500 nm to a wavelength of 1500 nm. Interpreting this as a Doppler effect, the speed of recession of this quasar is: _____ C (C is the light speed).

第二部分：計算題（20分）

共2題，每題10分，請於答案卷上依序作答並標明題號（中英文作答均可，需詳列計算過程）。

- Find the change in entropy (ΔS) for n moles of an ideal monatomic gas (single-atom gas) in the following process:
 - The temperature changes from T_1 to T_2 at constant volume. (5 points)
 - The volume changes from V_1 to V_2 at constant temperature. (5 points)
- Robert Hofstadter won the 1961 Nobel Prize in Physics for his pioneering work in studying the scattering of 20-GeV electrons from nuclei.
 - What is the γ factor for an electron with total energy 20.0 GeV? (5 points)
 - Find the wavelength of the electron. (5 points)