A. 請依句意，選出最適當的字彙: (20%)

1. The _____ events of his childhood had scarred him for life.
   (A) ambivalent　　(B) coercive　　(C) outrageous　　(D) traumatic

2. His _____ to the dirty old man is written all over his face.
   (A) aversion　　(B) contemplation　　(C) compulsion　　(D) discretion

3. His health is _____, and he lost all hope of recovery.
   (A) conceding　　(B) deteriorating　　(C) fluctuating　　(D) undermining

4. Is it _____ to complete the research by June?
   (A) available　　(B) derivable　　(C) feasible　　(D) inevitable

5. She could _____ a faint light at the end of the forest.
   (A) discern　　(B) elicit　　(C) extract　　(D) reckon

6. A judge can't make _____ decisions—he must follow the rules of law.
   (A) arbitrary　　(B) conventional　　(C) deliberate　　(D) mandatory

7. The children quarreled but soon _____.
   (A) consented　　(B) inclined　　(C) prevailed　　(D) reconciled

8. Nonreligious people believe that death brings complete _____.
   (A) adversity　　(B) desolation　　(C) nostalgia　　(D) oblivion

9. Writing a history book _____ a lot of work.
   (A) conceives　　(B) entails　　(C) renders　　(D) solicits

10. She is a woman of _____ who has never abandoned her principles.
    (A) congruity　　(B) frugality　　(C) integrity　　(D) serenity

B. 請依句意，選出正確的字語: (20%)

1. My parents demanded that I _____ give up college.
   (A) not　　(B) do not　　(C) not to　　(D) did not

2. Anyone can make a pie. There's nothing _____ it.
   (A) about　　(B) in　　(C) with　　(D) to

3. _____ you promise to help me will I go away.
   (A) Except　　(B) Unless　　(C) Not until　　(D) As long as

4. The trousers are too long; I must have them _____.
   (A) shorten　　(B) shortened　　(C) be shorten　　(D) be shortened

5. Julio was _____ that we liked the dinner he prepared.
   (A) delight　　(B) delighted　　(C) delighting　　(D) delightful

6. David was not capable _____ the tennis match because he had been injured.
   (A) to win　　(B) winning　　(C) in winning　　(D) of winning

7. He asked me _____ her.
   (A) not to contact　　(B) not to contact with　　(C) don't contact　　(D) don't contact with

8. Criticism is highly necessary _____ that it helps to monitor the progress of our work.
   (A) for　　(B) by　　(C) in　　(D) with

9. When we were small, we _____ our holidays on a farm.
   (A) used to spend　　(B) used to spending　　(C) were used to spend　　(D) were used to spending

10. A trip to Paris—that's _____.
    (A) a too good to be missed opportunity　　(C) a too good opportunity to miss
    (B) an opportunity too good to be missed　　(D) too good an opportunity to miss

C. 請選出最接近的句意: (20%)

1. He knows German and French, to say nothing of English.
   (A) He knows German and French and English.
   (B) He knows German and French, but not English.
   (C) He knows German and French, and it doesn't matter if he knows English or not.
   (D) He knows German and French, but it's not clear whether he knows English or not.

2. There's not a man here but would like to be in your place.
   (A) No man here would like to be in your place.
   (B) Every man here would like to be in your place.
   (C) Only one man here would like to be in your place.
   (D) Only one man here would not like to be in your place.

3. I don't know him; I have not so much as heard his name.
   (A) I don't know him; I've only heard his name.
   (B) I don't know him, but I've heard his name many times.
   (C) I don't know him, but I've heard his name a few times.
   (D) I don't know him, and I've not even heard his name before.

4. She knew better than to argue with him.
   (A) She knew enough to argue with him.
   (B) She knew better ways than arguing with him.
   (C) She knew she could beat him in the argument.
   (D) She knew it would do no good arguing with him.

5. You can leave right now for all I care.
   (A) You'd better leave right now.
   (B) I don't want you to leave right now.
   (C) You will leave right now if you care about me.
   (D) It won't bother me a bit if you leave right now.

6. The importance of the invention cannot be overvalued.
   (A) The invention is not important.
   (B) The invention is extremely important.
   (C) The invention is more important than we thought.
   (D) The invention is important but not that important.

7. John was only too ready to agree with her.
   (A) John agreed with her completely.
   (B) John did not agree with her at all.
   (C) John wanted to agree with her but couldn't.
   (D) John had made up his mind not to agree with her.

8. He's as brave as any in the world.
   (A) He's not brave at all.
   (B) He's not particularly brave.
   (C) He's the bravest man in the world.
   (D) He's the only brave man in the world.

9. I don't think he is above taking bribes.
   (A) I think he takes bribes.
   (B) I don't think he takes bribes.
   (C) I think it's possible for him to take bribes.
   (D) I don't think it's possible for him to take bribes.

10. He is the last person I expected to see here.
    (A) I didn't want to see him here.
    (B) I never thought I would see him here.
    (C) I thought he would be the last one to arrive.
    (D) I wanted to see other people before I see him.

D. 請依中文句意填充: (20%)

1. 他很容易生氣。 He _____ .
2. 我覺得有必要告訴他實情。 I find _____ tell him the truth.
3. 他掙的錢是我的兩倍。 He earns _____ as I do.
4. 你知道他要去哪兒? Do you know _____ ?
5. 你認為他對這件事會有什麼反應? _____ react to this?
6. 打字打得越快，犯的錯就越多。 The faster you type, _____ .
7. 他比較像生意人而不像學者。 He is not _____ a scholar as a businessman.
8. 他們跟我們一樣解決不了問題。 They are _____ solve the problem than we are.
9. 他下樓梯時好匆忙，差點把我撞倒。
   He was _____ that he almost pushed me over on the stairs.
10. 如果不是下雨的關係，我們會有很好的收成。
    _____ the rain, we would have had a good harvest.

E. 請閱讀下面的文章，然後用<u>中文</u>寫出三百多字的摘要: (20%)

It was late when the Scientific Council adjourned, and the old Professor walked slowly along the Institute's quiet corridors. Here and there lights still burned in the laboratories, and the shadows of students and robots flashed through the frosted glass windows.

The Professor had spent almost his whole life in the Institute—as a student, teacher, and now as its Director:.... Some day it would probably bear his name, but the Professor hoped this day would not come soon....

As he walked he thought about the debate which had again flared up at the meeting of the Scientific Council. It was not the first time the question had come up, and, most likely, time alone would tell who was right and whether what was now happening among students was merely a passing fad or something more serious. The Professor dearly hoped it was nothing more than the latest student craze.

It is difficult to say when and how it all began.... About five years ago.... At first, the ridiculous efforts of the students to emulate robots were merely amusing and perhaps a little irritating. Young people, calling themselves "robotniks," began to talk about themselves as they would normally talk about cybernetic systems: "This book fed me approximately so many units of new information...."

Later on they learned to imitate the gait and angular movements of robots and to stare blankly without blinking: their faces became as expressionless and impassive as the flat, vacant faces of robots.

Naturally, there is always someone who is irritated by the latest fads. The Professor well remembered how, some fifty years ago, young fellows, himself included, began to sport beards and goatees in imitation of the beatniks. And before that...hairdos similar to Tarzan's were the rage. And now the latest craze was to shave your face and head clean, because robots, after all, were completely hairless.

But it wasn't this that worried the Professor.

Now it was considered, at the least, old fashioned to be happy or sad, to laugh or cry; real robotniks deplored the display of any emotion whatsoever. "Bad form," they said.

"In this day and age," they asserted, "when we can synthesize any emotion and break down any feeling into its component parts in the laboratory, sentiment is obsolete and irrational to the point of absurdity.

No bona fide robotnik would ever dare risk being called old fashioned and irrational. Pure, cold reason was their guide in everything they did. Robotniks studied conscientiously because it was the rational thing to do. Robotniks didn't cut classes because that would be irrational behavior.

On alternate Saturdays, the robotniks threw parties, drank, danced, and then, pairing off, went their separate ways. Their brains, those imperfect machines, demanded relaxation.

The robotniks were interested only in Science, because it was modern, cold, and rational. They worshipped Logic and Mathematics; "We shall be as robots" was their slogan.

Was this a fad or something far more serious? Literally all the young folk of today had become robotniks. And if it was only a passing craze, why did it persist so long...?

"I can't bear to be without you, don't you understand? I can't!" the Professor suddenly heard someone say excitedly. "When you're not with me, I think about you, and as soon as I know that we're going to see each other in a short while I feel as if I'm dancing on air. Honestly, I don't know what to call the state I'm in. Do you understand what I'm trying to tell you?"

And he was overwhelmed with such a feeling of gratitude toward those whose conversation he had accidentally overheard that he could not restrain himself from taking one quick look into the laboratory from which the voices were coming. There was no one in the laboratory except two robots. The old Professor shook his head sadly and closed the door.

He had completely forgotten about the latest silly fad among robots: robots were now trying to imitate human weaknesses.

數字需準確到小數點下2位

1. 某項早餐食品的熱量(calories per serving)調查顯示，70項受檢產品的基本統計量如下表所示，

Mean	146.43
Standard Deviation	46.97
Median	120.00
25 percentile	110.00
75 percentile	200.00
Minimum	50.00
Maximum	250.00

(i). (5分)請計算標準誤(standard error)?

(ii). (5分)請問此70項產品的熱量數據是否會呈對稱分佈?
為什麼?

2. 在一項早餐玉米片(cereal)的調查中，共收集了70項產品的資料：製造商(4家廠商)、食用形態(熱或冷)、熱量(calories per serving)、纖維(grams of fiber per serving)和碳水化合物(grams of total carbohydrates per serving)。為了探討研究目的：(i)熱食或冷食的熱量是否有差異，(ii)4家廠商出產的早餐玉米片的碳水化合物是否有差異，(iii)熱量與碳水化合物是否有關，(iv)4家廠商對生產熱食或冷食的早餐玉米片是否有偏好。請由下表中選出適合這4個研究目的的所有統計方法(可複選)

A. 2 sample t-test	B. Wilcoxon signed rank test
C. ANOVA	D. Wilcoxon rank sum test
E. Fisher's exact test	F. Chi-square test
G. McNemar test	H. Regression coefficient
I. Kappa statistics	J. Pearson correlation coefficient

研究目的(i) (5分)

研究目的(ii) (5分)

研究目的(iii) (5分)

研究目的(iv) (5分)

3. 在一項比較學童的 finger-wrist tapping score(MAXFWT)中，分了 ABC 3 組，以下是比較這 3 組 MAXFWT 平均值的分析，

(i) 請完成下面的 ANOVA 表(粗框的部份) (每格 5 分)：

Source	df	Sum of Squares	Mean Square	F Value	p-value
Model	2	966.7906			0.0125
Error	92				
Corrected Total	94	10637.9368			

(ii) 依照上表的結果，可以對 ABC 此 3 組學生的 MAXFWT 做何結論？(5 分)

若將 C 組學童設為對照組，並針對 AB 兩組設 dummy variables，執行 model one 及 model two 的複回歸(multiple regression) 分析後，得到估計的迴歸係數(regression coefficient 或 parameter estimate)如下表：

	Model One	Model Two
Group C	reference	reference
Group A	-7.51	-5.29
Group B	-5.70	-4.99
Age in years		2.44

(iii) 請解釋上表中"-7.51"所代表之意義？(5 分)

(iv) 同樣是 dummy variable Group B 的迴歸係數，請解釋上表中"-5.70"與"-4.99"所代表之意義差異在哪裡？(10 分)

(v) 如果 Group A 的係數在 model one(-7.51)和 model two(-5.29)的結果算是很大的差異，請問應如何解釋此現象？(10 分)

4. 針對一抽菸與肺癌關係之研究，執行 multiple logistic regression 得到下面之結果：

parameter	Odds Ratio	p-value
Smoking vs non-smoking	5.12	0.0001
Age in years	1.03	0.0091

請針對(i) (5 分)smoking status 及(ii) (5 分)age 描述分析結果。

5. 在一個 2×2 的表格中做卡方檢定(chi-square test)後，發現表格中有些預期值(expected value)小於 5，請問可用哪種方法來取代卡方檢定成為較可行之檢定法? (5 分)

6. 居住於某一社區居民之平均年齡為 47 歲，其平均年齡之 99%信賴區間為(33, 57)，95%信賴區間為(35, 55)，90%信賴區間為(37, 53)，若要檢定平均年齡是否顯著地不同於 56 歲，請問 p 值的範圍為何？(5 分)

一、說明下列儀器或研究技術之原理及用途 (60分)：

    1. Flow cytometry
    2. Laser microdissection
    3. DNA microarray
    4. Reversed phase HPLC
    5. Confocal microscope
    6. Patch clamp

二、蛋白質體學研究包括: a)蛋白質表現, b)蛋白質交互作用及 c)蛋白質構造等三大方向，請選擇兩項說明其研究方法（15分）

三、請敘述研究細胞訊息傳遞路徑所需之方法並說明 RNA interference 及 antisense oligonucleotide 在此研究之利用（15分）

四、Real-time PCR 之原理如何？如何設計 PCR primers？（10分）