

Part I. Question 1 to 10, please choose the answer closest to the underlined word or phrase. Question 11 to 15, please choose the answer that best completes the sentence. One Answer Only. 2 points.

1. Some of the **potential** dangers to cows treated with synthetic bovine growth hormone were brought into light through the effort of some scientist.
(A) related (B) possible (C) certain (D) obvious
2. As more U.S workers spend their days at keyboards, hand injuries and lawsuits are **multiplying**.
(A) increasing (B) minimizing (C) boundary-crossing (D) profit-making
3. There are several **bodies** that match volunteers with voluntary groups, including the National Volunteering Centre.
(A) organizations (B) remains (C) people (D) motivations
4. Piaget believed that we go through four stages in understanding the world. Each of the stages is age-related and consists of **distinct** ways of thinking.
(A) new (B) simple (C) different (D) exact
5. Some people think that spoken language is **transient** but writing tends to last because of its physical medium (characters on some surface).
(A) unimportant (B) temporary (C) interesting (D) clear
6. But what most prevents women from reaching the boardroom, say bosses and headhunters, is lack of **hands-on** experience of a firm's core business.
(A) significant (B) available (C) tested (D) practical
7. Manufactured in the **tranquil** New England town of Concord, New Hampshire, the famous Concord Coach came to symbolize the Wild West.
(A) peaceful (B) bustling (C) industrial (D) tiny
8. With oil prices shooting up, the demand for big cars is **dwindling**. Now compact cars are on great demand.
(A) depressing (B) surpassing (C) decreasing (D) swirling
9. All of this she conferred on me without ever **setting foot in** the kitchen of her house.
(A) leaving (B) dressing (C) entering (D) preparing
10. In choosing your career, you should follow your heart, but you also need to be **rational**.
(A) making decisions based on intelligent thinking (B) making decisions using strong emotion of feeling
(C) making decisions because of relationships (D) making decision because of profits
11. _____ abolishing death penalty is a global trend, the public is so polarized over the issue that it requires more discussion.
(A) Because (B) Whereas (C) Although (D) In addition to
12. Women now often work areas _____ medicine, business management and higher education, which would not have been possible 100 years ago.
(A) regardless of (B) in virtue of (C) due to (D) such as
13. Both the National Cancer Institute and the World Health Organization say there isn't evidence to support the assertion that cell phones are a _____ threat.
(A) health public (B) healthy public (C) public-health (D) publically health
14. _____ on barren slopes can help prevent erosion.
(A) Planting trees (B) For trees to be planted (C) In order to plant trees (D) Trees are planted
15. Almost four in five people around the world believe that _____, a poll for the BBC World Service suggests.
(A) access the Internet is a fundamental right (B) that access to the Internet is a fundamental right
(C) fundamental right accessing the Internet is (D) the fundamental right is access the Internet

II. Question 16 to 25, please choose the best answer to fill each of the numbered blanks in the passages. 2 points each.

People communicate in many different ways and yawning is one important means of 16 communication. It gives many different 17 to people and everyone yawns. Some birds, reptiles, fish and most mammals also yawn. However, the reason why we do it is still a mystery. There is also very little research available on yawning as for most people, it is not a problematic 18. Here are a few things that are known about yawns: 1.) The 19 duration of a yawn is about six seconds; 2.) in humans, the 20 yawn happens about eleven weeks after conception; 3.) Yawns become contagious to people between the first and second years of life.

16. (A) audio (B) friendly (C) non-verbal (D) scenario
 17. (A) messages (B) funs (C) challenges (D) experiments
 18. (A) resistance (B) repeat (C) reflex (D) rejection
 19. (A) critical (B) analytical (C) terminal (D) average
 20. (A) most difficult (B) earliest (C) most fundamental (D) experiential

Culture shock can be an excellent lesson 21 human differences. The reason culture shock occurs is that we are not prepared for these differences. 22 the way we are taught in our culture, we are all ethnocentric. This term comes from the Greek root ethnos, 23 a people or group. Thus, it refers to 24 our outlook or world view is centered on our own way of life. Ethnocentrism is the belief that one's own patterns of behavior are the best: the most natural, beautiful, right, or important. Therefore, other people, 25 that they live differently, live by standards that are inhuman, irrational, unnatural, or wrong.

21. (A) on relative values and understanding (B) in relative values and in understanding
 (C) about relating values and on understanding (D) by means of relative values and understanding
 22. (A) Because of (B) Because (C) In the event of (D) In spite of
 23. (A) it means (B) it is meaning (C) meaning (D) by meaning
 24. (A) that the fact (B) the fact that (C) the fact (D) the fact that is
 25. (A) to the extend (B) by and large (C) more or less (D) drawing a line

III. Reading Comprehension. In this part, you will read several passages. Each one is followed by a number of questions. Question 26 to 40, you should choose the ONE best answer to each question. 2 points each.

Dariusz Leszczynski, a research professor at Finland's Radiation and Nuclear Safety Authority in Helsinki, has done studies indicating that radio frequency radiation may create a stress reaction in the cells that line blood vessels, leading to a dangerous breach in the blood-brain barrier. "Mobile-phone radiation may be able to indirectly hurt cells, perhaps by interfering with their ability to repair normal DNA damage," he says. "Given the scientific uncertainty, it's premature to say the use of cell phones is safe."

If radio frequency radiation increases the chances of developing brain cancer, it should show up in long-term studies of cell-phone users. But many epidemiological studies have found no clear connection, including a 2007 Danish Cancer Society study of 421,000 cell-phone users, which led many in the media to conclude that mobiles are harmless. To date, "peer-reviewed scientific evidence has overwhelmingly indicated that wireless

devices do not pose a risk," says John Walls, a spokesman for CTIA, a global wireless association.

26. According to Prof. Dariusz Leszczynski,

- (A) whether or not the use of cell phones is safe is still uncertain.
- (B) it is proved that cell phone would impair normal DNA.
- (C) Using cell phones will block blood vessels.
- (D) The research on cell phones is not reliable.

27. The passage following these two passages might be about

- (A) the autobiography of Dariusz Leszczynski.
- (B) problems with many of these studies.
- (C) the development of brain cancer.
- (D) peer review of cell phones.

While fats have lately acquired a bad image, one should not forget how essential they are. Fats provide the body's best means of storing energy, a far more efficient energy sources than either carbohydrates or proteins. They act as insulation against cold, as cushioning for the internal organs, and as lubricants. Without fats, energy would have no way to utilize fat-soluble vitamins. Furthermore, some fats contain fatty acids that contain necessary growth factors and help with the digestion of other food.

An important consideration of fat intake is the ratio of saturated fats to unsaturated fats. Saturated fats, which are derived from dairy products, animal fats, and tropical oils, increase amount of cholesterol in the blood. Cholesterol may lead to coronary heart disease by building up in the arteries of the heart. However, unsaturated fats, derived from vegetable oils, tend to lower serum cholesterol if taken in a proportion twice that of saturated fats.

The consumption of a variety of fats is necessary, but the intake of too much fat may lead to a variety of health problems. Excessive intake of fats, like all nutritional excesses, is to be avoided.

28. Comparing with carbohydrates or proteins, fats

- (A) store food more efficiently.
- (B) deserve their bad image.
- (C) consume more oils.
- (D) provide more fluids.

Which of the followings is the main idea of

29. The main idea of the third paragraph is that

- (A) people are eating less and less fat today.
- (B) fats should be eliminated.
- (C) excessive consumption of fats may be dangerous to one's health.
- (D) fats taken in the proper proportion may reduce serum cholesterol.

30. With which of the following is the whole passage primarily concerned?

- (A) The role of fats in human health
- (B) The dangers of cholesterol
- (C) The benefits of fats in the diet
- (D) The importance of good nutrition

Gender Equity

(1) In the past decade, increasing attention has been paid to the issue of gender equity in the science, technology, engineering, and mathematics (STEM) fields. Research publications, including the American Association of University Women Educational Foundation's Tech Savvy (2000) and Women at Work (2003), have documented the troubling shortage of girls and women preparing to work in these fields. In response to this "**shrinking pipeline**" of girls and women in STEM, a wide array of programs and strategies has been promoted and funded by governmental and nongovernmental organizations.

(2) The AAUW Educational Foundation and the National Science Foundation are among the top supporters of gender equity projects in the STEM fields. In the last decade alone, these two foundations have

invested nearly \$90 million to fund more than 400 projects specifically aimed at increasing the participation of girls and women in STEM fields. This body of projects presented a unique opportunity to explore the nature of gender equity intervention projects in STEM. Until now, no comparable survey of gender equity intervention projects in STEM has been done.

(3) The research for this report, led by Yasmin Kafai and a team of researchers at the University of California, Los Angeles, was guided by several overarching questions: What types of projects have been funded within and across the various STEM disciplines? Are there areas where we have concentrated our efforts, and areas we have overlooked? What patterns emerge among the project types and disciplines?

(4) The findings document impressive efforts in preparing girls and women for science, technology, engineering, and mathematics studies and careers and demonstrate a rich and diverse body of gender equity intervention projects within all STEM disciplines. About two-thirds of the projects involved extracurricular informal learning activities such as museum visits and field trips. Equally important were mentoring activities in many forms, ranging from traditional one-to-one to large-scale online versions, and professional development activities, such as course taking and network building, that were successfully integrated into projects.

(5) At the same time, the findings reveal some troubling trends. Many projects focused predominantly on career advice without providing access to necessary skill and content development. A majority of projects occurred outside the school curriculum. While such extracurricular projects can be effective and valuable, the overall lack of integration into the school curriculum suggests that gender equity remains on the margins of teaching and learning in the STEM fields. Finally, an absence of data on participant demographics and a lack of project evaluation make it difficult to determine who is being served and if and how project outcomes are being measured.

31. What does the phrase "shrinking pipeline" in paragraph refer to?

- (A) the shortage of oil supply (B) the shortage of labor supply
(C) the shortage of training programs (D) an issue that is getting smaller

32. Which of the sentences below best express the essential information in the highlighted sentence in the passage 2? (Incorrect choices change the meaning in important ways or leave out essential information.)

- (A) These projects allowed us to study the differences between men and women employed in STEM jobs.
(B) We were able to intervene when women STEM workers were being treated unfairly.
(C) Studying these projects helped to create more gender equity intervention projects.
(D) STEM jobs were able to be studied by exploring nature.

33. In paragraph 3, "Are there areas where we have concentrated our efforts, and areas we have overlooked?"

In this sentence, "we" refers to

- (A) the author and his/her coworkers. (B) people involved in creating gender equity projects.
(C) people in the STEM disciplines. (D) Yasmin Kafai and his team.

34. According to paragraph 4, what is one positive finding of this research?

- (A) the STEM field is rich and diverse (B) many projects involved mentoring opportunities
(C) girls and women are being prepared for STEM jobs (D) the quality of the questions asked

35. According to paragraph 5, what is one negative trend discovered through this research?

- (A) access to unnecessary content (B) extracurricular projects were common
(C) evaluation of the projects was too specific (D) focus on career advice

Chili peppers are decidedly an international phenomenon, spicing up regional dishes from Thailand to North Africa. In Thailand Confidential, this week's Globalist Bookshelf selection, Jerry Hopkins gives insight

to the culture and history surrounding this fiery fruit (yes, technically a fruit) and highlights how it may be one of the world's best medical miracles.

In Thailand — where restaurants rate their dishes by placing one, two, three, and sometimes four little red chilis on the menu next to the dishes' names to alert diners — I am tolerated. Barely.

A longtime friend, who is a Thai chef, used to bring home food purchased at street stalls and as she placed this on the table, she would point to one container and say, "Mine," then to another, saying, "Yours." As if to say, "Poor dear."

Thailand is not the birthplace of the Capsicum, or chili pepper; it only acts as if it is. In fact, the chili was imported, along with much else in the national diet. However, in Thailand the **per capital consumption** of the small, fiery fruit is surely as high if not higher than it is anywhere else. And it is in the use of unprocessed, fresh, ripe chilis where Thailand rings all the loudest bells.

The truth is that chili is an international phenomenon. There is a bimonthly magazine published in the United States, Chili Pepper (there is no agreement on the spelling), and a wide variety of products is available, including pepper-shaped wind chimes, bells, and strings of Christmas tree lights. There is even a Hot Sauce Club of America; members receive two new hot sauces and a newsletter every month. There is even a popular American rock and roll band that calls itself the Red Hot Chili Peppers. Yes, the band is hot.

36. From these passages, we learn that the author

- (A) enjoys chili peppers everywhere.
- (B) does not really like chili peppers.
- (C) likes to have chili peppers to go with some certain kind of food.
- (D) like to go to restaurant famous for chili peppers.

37. The best title for these passages is

- (A) Thailand and Chili peppers. (B) Chili Peppers and Spicy Dishes.
- (C) Different Tastes all over the World. (D) Chili Peppers and Globalization.

38. Based on the passages, which of the following is NOT TRUE?

- (A) That Thailand uses unprocessed, fresh, ripe chili peppers has started the popularity of chili peppers.
- (B) Thailand exports a lot of chili peppers.
- (C) Chili peppers are a kind of fruit.
- (D) Thai food is normally quite spicy.

39. What does **per capital consumption** mean?

- (A) amount consumed per person within a specific population.
- (B) capital population and its consumption.
- (C) capital with that the government provides each person for food consumption.
- (D) capital that each person can get for their daily food consumption.

40. What is the main idea of the last paragraph?

- (A) Chili peppers are very popular in the United States.
- (B) The use of chili peppers in the United States is being influenced by Thailand.
- (C) Chili peppers are made into different toys.
- (D) Chilli peppers have made a rock band very hot.

IV. Essay. 20 points.

Please write a **well-structured** essay on **how you can prepare yourself for living in a diverse and more global society** in 150 to 200 words discussing your opinions.

高雄醫學大學 99 學年度 研究所 招生考試 命題系所：藥學院聯合招生
考試科目：藥物分析學

一 說明下列分析有關名詞(32%)(每小題 4 分)

- | | |
|--|-------------------|
| 1. Lambert-beer law | 5. pKa |
| 2. Conjugate acid and conjugate base | 6. fluorometry |
| 3. Iodometry and iodimetry | 7. chemical shift |
| 4. Dichlorophenol-indophenol titration | 8. potentiometry |

二 請敘述氣相層析法中電子捕獲型檢出器(ECD)與火燄離子型檢出器(FID)之檢出原理(10%)

三 層析分離法之管柱分離效率，常以 van Deemter 方程式($HETP = A + B/\mu + C\mu$)來評估，請說明方程式中有關各項之意義。(10%)

四 簡述毛細管電泳分析法(8%)

五 Sulfamerazine(美拉磺胺)($pK_a = 5.6$)溶於 pH 3.6 緩衝溶液中，則溶液中解離態 Sulfamerazine/非解離態 Sulfamerazine 之比例為何？(8%)

六 簡述質譜分析儀在藥物分析之應用(8%)

七 某化合物(MW: 240)之溶液,其濃度為 $240 \mu\text{g/ml}$, 此溶液置於內徑 1cm cell 中, 測得其吸光度為 0.27,則其莫耳吸收係數(molar absorptivity)為何?(8%)

八 請就下列鍵結(bonding)之 stretching 對紅外光吸收之共鳴波數大小順位排列之。
(a) C-C (b) C=C (c) C \equiv C (d) N-H (6%)

九 維生素 A 醇(Retinol)，維生素 A 乙酸酯(Vitamin A acetate)，維生素 A 棕梠酸酯(Vitamin A palmitate) 以 octdecyl silane (ODS, C18)矽膠為固定相，甲醇-水(30:70;v/v)為展開溶劑，進行高效能層析分析，其滯留時間大小排列為何？(5%)

十 請就下列四種化合物依極性大小順位排列之, A: $\text{CH}_3\text{CH}_2\text{COCH}_3$;
B: $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$; C: $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$; D: $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$ (5%)

1. 試述藥物作用之 transmembrane signaling 機轉，並請分別舉例說明。(10%)
2. 試述 Isosorbide dinitrate、Nitroglycerin 和 Amyl nitrite 之作用機轉並比較三者異同?(8%)
3. 請舉 Serotonin agonist 和 antagonist 各二個藥物，說明其作用機轉、臨床用途和副作用?(10%)
4. 試比較神經肌肉阻斷劑裡，非去極化與去極化藥物之異同?(10%)
5. 試述治療骨質疏鬆症(Osteoporosis)的藥物，說明其作用機轉、臨床用途和副作用?(12%)
6. 請由氣喘的病理機轉進而闡述治療藥物的選用時機與原因?(10%)
7. 試以圖形標示利尿劑的主要藥物之作用點，並分別說明其機轉與副作用?(15%)
8. 試以圖形標示抗病毒的主要藥物之作用點，並分別說明其機轉與臨床用途?(15%)
9. 請將以英文翻譯成中文，並以圖解表示作用機轉。(10%)

Basic Pharmacology of Lithium

Pharmacodynamics: Lithium directly inhibits two signal transduction pathways. It both suppresses inositol signaling through depletion of intracellular inositol and inhibits glycogen synthase kinase-3 (GSK-3), a multifunctional protein kinase. GSK-3 is a component of diverse intracellular signaling pathways. These include insulin/insulin-like growth factor signaling, brain-derived neurotrophic factor (BDNF) signaling, and the Wnt signaling pathway. All of these lead to inhibition of GSK-3. GSK-3 phosphorylates β -catenin, resulting in interaction with transcription factors. The pathways that are facilitated in this manner modulate energy metabolism, provide neuroprotection, and increase neuroplasticity.

Effects on second messengers: Early studies of lithium demonstrated changes in brain inositol phosphate levels, but the significance of these changes was not appreciated until the second-messenger roles of inositol-1,4,5-trisphosphate (IP3) and diacylglycerol (DAG) were discovered. Inositol trisphosphate and diacylglycerol are important second messengers for both α -adrenergic and muscarinic transmission. Lithium inhibits inositol monophosphatase (IMPase) and other important enzymes in the normal recycling of membrane phosphoinositides, including conversion of IP2 (inositol diphosphate) to IP1 (inositol monophosphate) and the conversion of IP1 to inositol. This block leads to a depletion of free inositol and ultimately of phosphatidylinositol-4,5-bisphosphate (PIP2), the membrane precursor of IP3 and DAG. Over time, the effects of transmitters on the cell diminish in proportion to the amount of activity in the PIP2-dependent pathways. The activity of these pathways is postulated to be markedly increased during a manic episode. Treatment with lithium would be expected to diminish the activity in these circuits.

一、解釋名詞：每題二分 20 %

1. exon
2. glyoxylate cycle
3. ligand
4. humanized antibody
5. carcinogenesis
6. β -oxidation
7. tRNA
8. operon
9. zinc finger
10. zymogen

二、簡答題：每題三分 30 %

1. 說明下列各方法測定那些物質？
a. Northern blot b. Western blot c. Southern blot
2. 脂溶性維生素有那些？
3. 寫出三種可做為 second messenger 的物質？
4. 何謂 basal metabolic rate (BMR)？
5. 簡述 polymerase chain reaction (PCR)？
6. 人類的 immunoglobulins 有那幾種？
7. High-density lipoproteins 在人體內有何重要性？
8. Arachidonic acid 可代謝成那些重要產物？
9. 何謂 wobble hypothesis？
10. 寫出兩種可利用分子量大小分離純化蛋白質的方法？

二、問答題：每題十分 50 %

- (一)、請詳述 insulin、glucagon 和 leptin 彼此間如何調控血醣？
- (二)、寫出 urea cycle 中間代謝產物及其有何重要性？
- (三)、請詳述經由那些代謝循環可使 glucose 完全代謝產生能量？
- (四)、說明 cholesterol 的重要性，及可利用 cholesterol 合成那些 hormone？
- (五)、請詳述 DNA replication 過程及參與的 enzyme 有那些？