

中央警察大學 100 學年度碩士班入學考試試題

所 別：各所

科 目：國文

作答注意事項：

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- 4.請以橫式書寫作答。

壹、解釋下列詞句之義：(每小題 10 分，共 50 分)

- 一、出處、去就、辭受、取與之辨，孔子、孟子之所恆言。(顧炎武〈與友人論學書〉)
- 二、惟其遇事而事治，畫策而利害得，治國而國安焉。(王安石〈材論〉)
- 三、聖人不積，既以為人已愈有，既以與人已愈多。(《老子·第八十一章》)
- 四、夫君子之行，靜以修身，儉以養德，非澹泊無以明志，非寧靜無以致遠。(諸葛亮〈誠子書〉)
- 五、李離曰：「理有法，失刑則刑，失死則死。公以臣能聽微決疑，故使為理。今過聽殺人，罪當死。」(《史記·循吏列傳》)

貳、論文：50 分

語云：「克己可以治怒，明理可以治懼。」試論之。

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壹、解釋下列語句之義：(每小題 10 分，共 50 分)

- 一、盡其心者，知其性也；知其性，則知天矣。存其心，養其性，所以事天也；天壽不貳，修身以俟之，所以立命也。(《孟子》)
- 二、為天下及國，莫如以德，莫如行義。(《呂氏春秋》)
- 三、從心而動，不違自然所好；順性而遊，不逆萬物所好。(《列子》)
- 四、夫腹飢不得食，膚寒不得衣，雖慈母不能保其子，君安能以有其民哉？(《論貴粟疏》)
- 五、天地有正氣，雜然賦流形。下則為河嶽，上則為日星。於人曰浩然，沛乎塞蒼冥。(《正氣歌》)

貳、論文：50 分

題目：子曰：君子固窮，小人窮斯濫矣。

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壹、解釋下列語句之義：(每小題 10 分，共 50 分)

- 一、子曰：「三年學，不至於穀，不易得也。」(《論語·泰伯》)
- 二、古者四民異業而同道，其盡心焉，一也。(王陽明〈節菴方公墓表〉)
- 三、昔大禹鑿九山，通九江，用人力極廣，而無怨讟者，物情所欲，而眾所共有故也。(《貞觀政要·論儉約》)
- 四、固知一死生為虛誕，齊彭殤為妄作。(王羲之〈蘭亭集序〉)
- 五、廷尉，天下之平也，一傾而天下用法皆為輕重，民安所措其手足？(《史記·張釋之列傳》)

貳、論文：50 分

《孫子兵法·九變》云：「將有五危：必死，可殺也；必生，可虜也；忿速，可侮也；廉潔，可辱也；愛民，可煩也。凡此五者，將之過也。用兵之災，覆軍殺將，必以五危，不可不察也。」請參酌前引古文思想，以「危機管理中的情緒管理」為題，書寫論文一篇。

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壹、解釋下列詞句之義：(每小題 10 分，共 50 分)

- 一、民不畏死，奈何以死懼之？若使民常畏死，而為奇者，吾得執而殺之，孰敢？(《老子·第七十四章》)
- 二、百戰百勝，非善之善者也；不戰而屈人之兵，善之善者也。(《孫子·謀攻》)
- 三、非我而當者，吾師也；是我而當者，吾友也；諂諛我者，吾賊也。(《荀子·修身》)
- 四、文武不備，良民懼然身修者，官未曾亂也。奉職循理，亦可以為治，何必威嚴哉？(《史記·循吏列傳》)
- 五、天下不可以力勝，神祇不可以親恃。惟當弘儉約，薄賦斂，慎終始，可以永固。(《貞觀政要·納諫》)

貳、論文：50 分

題目：王陽明《傳習錄》：「未有知而不行者；知而不行，只是未知。」請參酌前引古文思想，以「論知與行」為題，寫作論文一篇。

說明：

- 一、文言、白話不拘。
- 二、須分段，並使用標點符號。
- 三、字跡不可潦草。
- 四、字數不得少於五百字。

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壹、解釋下列詞句之義：(每小題 10 分，共 50 分)

- 一、呦呦鹿鳴，食野之蒿。我有嘉賓，德音孔昭。視民不怵，君子是則是傲。我有旨酒，嘉賓式燕以敖。(《詩經·小雅·鹿鳴》)
- 二、初，鄭武公娶于申，曰武姜，生莊公及共叔段。莊公寤生，驚姜氏，故名曰寤生，遂惡之。愛共叔段，欲立之。亟請於武公，公弗許。(《左傳》隱公元年)
- 三、往者貞觀之初，率土霜儉，一匹絹才得粟一斗，而天下帖然。百姓知陛下甚憂憐之，故人人自安，曾無謗讟。(《貞觀政要·論儉約》)
- 四、發慮憲，求善良，足以諉聞，不足以動眾；就賢體遠，足以動眾，未足以化民。君子如欲化民成俗，其必由學乎！(《禮記·學記》)
- 五、子曰：「君子之於天下也，無適也，無莫也，義之與比。」(《論語·里仁》)

貳、論文：50 分

〔宋〕蘇軾〈刑賞忠厚之至論〉云：「先王知天下之善不勝賞，而爵祿不足以勸也；知天下之惡不勝刑，而刀鋸不足以裁也。是故疑則舉而歸之於仁，以君子長者之道待天下，使天下相率而歸於君子長者之道。」請參酌前引古文之思想，以「忠厚乃待人之道」為題，寫作論文一篇。

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一、Vocabulary and Phrases translation(中翻英、英翻中)：(20 分)

- (一) 擒拿術
- (二) 落地簽證
- (三) 驅逐出境
- (四) 未成年者
- (五) 緩刑
- (六) an extortion ring
- (七) Internet auction fraud
- (八) reckless motorcyclists
- (九) (to) conduct an impartial investigation
- (十) large-scale nuclear incidents

二、Passage Translation：(30 分)

(I) Please translate the following passage into correct Chinese：

In 1999, a teenage girl was taken from a Haitian orphanage and smuggled — using fake documentation — into Miami, where she was forced to work as a domestic servant for up to 15 hours a day, seven days a week. She was never paid, not allowed to go to school, occasionally beaten, and subjected to other inhumane treatment. After suffering for nearly six years, she managed to escape in 2005. This March, justice was finally served when three of her captors were convicted in the case. This is just one of hundreds of heart-breaking human trafficking cases the FBI investigates each year.

(II) Please translate the following passage into correct English：

一般人相信，要保持健康，人們應該盡量避免生活中的壓力源。然而，這種策略效果有限。想避免壓力也可能導致人們避免人生中有意義的改變，諸如工作的改變或升遷。此外，試圖去避免壓力通常也不切實際。舉例而言，一個人怎能避免生命中父母親過世的打擊？事實上，假如人們不去面對人生的一些壓力，到頭來終將覺得無聊和缺乏刺激，這對身體也可能有害。

三、Reading Comprehension：(20 分)

David:

I'll be away for a week but my grandfather will let you in to use the computer. There are a few things you need to know. Brian Lee will call on Tuesday night and ask for information on our class science project. Please see the appropriately labeled files in the folder of that name in My Documents. He will ask you some specific questions and you may answer, but giving him any numerical information from the "SCIPorjData" file is something we might regret later, because we don't want other teams to copy our data.

Also, I've had some trouble with the computer recently. I wanted to get it fixed last week but had no time. There are unexpected crashes about once an hour and

mysteriously deleted files around once a week, so back everything up on an ongoing basis. The best way is just to burn it onto a CD after you finish working each day, but save your work every five minutes or so to avoid losing it in a crash.

One last thing: Go ahead and download music if you want but don't add any new names to the approved lists for my peer-to-peer music sharing software. I don't want strangers poking through my computer.

Have fun!

Jerry

1. What is the relationship between David and Jerry?
Choose the most likely answer from the choices below.
(A) They are brothers. (B) They are co-workers.
(C) They are classmates. (D) They are co-workers of Brian Lee
2. How often should David save files he's working on?
(A) Each day (B) Every hour
(C) Every week (D) Every five minutes
3. Which of the following isn't correct?
(A) Brian Lee mustn't be put on the approved list.
(B) Brian Lee can have some information about the science project.
(C) David hasn't had his computer fixed recently.
(D) The "SCIPorjData" file has a lot of numbers in it.

Every year in Nepal, young men answer a call to recruitment for one of the most feared and respected groups of soldiers in the world – the Gurkhas. On a typical year, 28,000 will come, yet only about 230 will be chosen to join the ranks of some 3,500 elite soldiers. Surprisingly, these soldiers fight not for their own country, but for the United Kingdom.

During the time of British domination of the Indian subcontinent, British soldiers encountered many stubborn enemies, though few as tough and warlike as the Gurkhas. After the Anglo-Nepali war (1812-1815) the British, so impressed by their adversaries, recruited several regiments of Gurkha soldiers to join the colonial army. They have not regretted this decision, as the Gurkhas' incredible toughness, ferocity and loyalty have won them great respect and many formal honors in numerous conflicts across the world.

Thus, the British Army maintains the Brigade of Gurkhas to this day, although its soldiers are all Nepalese citizens. In recent years, however, there have been signs of strain in the relationship. This is due to the growing controversy surrounding the disparity in pay between the Gurkhas and regular UK servicemen, with the latter making far more money than the former.

4. Why is there growing strain in the relationship between the Gurkhas and the British Army?
(A) The Gurkhas make more money than the regular UK servicemen.
(B) The Gurkhas make less money than the regular UK servicemen.
(C) The Gurkhas are Nepalese but serve in the British Army.
(D) Not enough Gurkhas are chosen from among the potential recruits.
5. The word "surrounding" is underlined to mean ...
(A) On all sides (B) Close to
(C) Between (D) About
6. Which of the following is true?
(A) Only 230 out 3,500 recruits are selected annually.
(B) Only 3,500 out of 28,000 recruits are rejected annually.
(C) Only 230 out 28,000 recruits are selected annually.
(D) Of 28,000, approximately 230 are rejected annually.
7. Which of the following would be the best title for this article?

- (A) The Soldiers of Nepal (B) A History of the Gurkhas
(C) The Gurkhas, Fierce and Loyal Soldiers (D) Money Problems in the British Army

A seized goods auction sale will take place at 8 AM on Friday, December 10th at the Yellow Dog Fairground in Carleton Place Township. The fairground is located on Highway 15 just north of the town center. For sale by auction will be light trucks, SUVs, sedans, motorcycles and off-road vehicles. Most of these approximately 800 vehicles have been judicially confiscated for use in federal crimes. Others have been repossessed for failure to meet the payment schedule. All vehicles have been given basic overall mechanical appraisal and repairs. They have also been cleaned and are free from all stains and illegal materials.

All interested members of the public 18 years old and above are invited to the fairground at the above time and place. All potential buyers must register in advance of the auction and may do so on-site or through our website, www.CPpolice.gov. Registration must be completed before 8 AM. Bidders must have credit cards with verifiable limits above the sale price, or pay by cash or cashier's check. Security at the site will be provided by the Carleton Place Sheriff's department. To view our catalogue, please see our website.

8. Why are most of these vehicles being offered for sale?
Choose the best possible answer from the choices below.
(A) Because there is an auction.
(B) Because they were confiscated from rich people.
(C) Because they were used in crimes.
(D) Because they were too expensive for the police.
9. What is something that ISN'T required in order to participate in the auction?
(A) Prove of age (B) Knowledge of vehicles
(C) Advanced registration (D) The necessary funds
10. The word "fairground" used repeatedly in the article is closest in meaning to which of the following definitions?
(A) Police-owned land
(B) A place where the prices are fair
(C) A place where dogs can live
(D) Open space used for exhibitions and similar events

四、Essay：(30 分)

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一、 Vocabulary：(20 分)

1. _____ is the pat-down of a person's outer clothing after a stop to see if the suspect has a weapon or something that feels like a weapon, which can be seized by the officer.
(A) Search (B) Arrest
(C) Frisk (D) Crack-down
2. Sharp objects and flammable items are _____ on the aircraft.
(A) prohibited (B) promoted
(C) admitted (D) permitted
3. _____ is the crime of deceiving people in order to gain something such as money or goods.
(A) Piracy (B) Murder
(C) Larceny (D) Fraud
4. Technical curricula are requisite in a wide range of fields.
(A) assimilated (B) promoted
(C) demanded (D) acquired
5. The expansion of public services has caused concern that the civil service branches are becoming autonomous powers.
(A) independent (B) advanced
(C) superior (D) perilous
6. Crowd behavior is characterized as a spontaneous collective reaction to a publicly observed event.
(A) chaotic (B) gratifying
(C) instinctive (D) uninterrupted
7. Because of his novel approaches to scientific problems, Edison was able to patent dozens of inventions.
(A) original (B) varied
(C) coherent (D) unbiased
8. The fire salamander is so called because of an antiquated belief that it could withstand fire.
(A) well-developed (B) old-fashioned
(C) carefully fabricated (D) widely held
9. The engineer had a _____ reason for changing the design of the building.
(A) peculiar (B) legitimate
(C) sharp (D) subsequent
10. The recent downturn in the housing industry _____ the poor economic conditions.
(A) radiates (B) symbolizes
(C) spans (D) synthesizes

二、Translation：(30 分)

1. Policy assessment studies in the 1970s cast doubt on the effectiveness of these strategies for preventing crime. For instance, the experimental study of preventive patrol in Kansas City found that changing the level of patrol coverage had no effect on crime and citizen fear of crime. Other evaluative research showed that rapid response to calls for service from citizens didn't increase the likelihood of preventing a crime or apprehending an offender. Finally, evidence from dozens of studies suggests that traditional police strategies to reduce, control, or prevent crime are ineffective.
2. The safeguards introduced under the Police and Criminal Evidence Act, such as an impartial custody officer, a right to free legal advice, strict time limits on the length of detention and the tape-recording of interviews, have subsequently made it more difficult for the police to engage in 'fishing expeditions', to detain suspects without firm grounds for doing so, to make informal deals with them or to apply physical or psychological pressures to induce them to confess.
3. In a study of miscarriages of justice in the USA where the convicted person had subsequently been completely exonerated as a result of DNA testing, it was found that the most common contributory factor was mistaken identity, which occurred in 52 percent of the cases. Caucasians misidentified African-Americans defendants in 35 percent of the cases, but African-Americans also misidentified other African-Americans in 24 percent of the cases.

三、Reading Comprehension：(20 分)

Concern for the environment in the US extends back into the nineteenth century, when nature lovers and sports enthusiasts first sought protection for areas of exceptional natural beauty or significance. But it was not until the late 1960's that environment concerns entered the mainstream of American political debate. By then many Americans had come to the conclusion that more development was not necessarily desirable, especially if it meant more polluted air, dying lakes and rivers, and a landscape strewn with unsightly waste, and crowded with sprawling construction projects. In May of 1970, several environmental groups staged the first Earth Day celebration, designed to heighten public awareness of environmental problems. The success of that initial effort led to it becoming a regular annual event.

During the 1950s and 1960s, industrial and vehicle pollution levels had become a serious threat to public health, so the environmental movement of this period focused heavily on restoring and ensuring the cleanliness of basic air and water supplies. Rapidly expanding development pressures were also **spurring** efforts to preserve unique lands and threatened wildlife habitats, and to protect the endangered species supported by them before they vanished into extinction. It is generally accepted that the environmental protection movement was so successful because of its grass roots support; groups of activists in hundreds of towns that took the initiative in cleaning up their own communities. During the 1970s, this local activism reinforced support for the passage of key laws at the national level, such as the Clean Water Act, Clean Air Act, Endangered Species Act, and National Environmental Policy Act, which together have constituted the foundation for environmental standards in the US ever since.

In addition to this national legislation, the year after the first Earth Day, by executive order, President Nixon established the Environmental Protection Agency (EPA); an organization dedicated to restoring and protecting the environment. The EPA **spearheaded** many contemporary efforts to protect the environment, but it was not working alone. It was allied with a wide variety of distinctly different and separate organizations ranging from a small number of well-funded high-profile national and international organizations to many thousands of smaller special interest groups and even individuals working at the local level. The EPA has now become one of the government's largest and most influential regulatory agencies. Through its own efforts and in cooperation with other organizations, it has earned a large measure of credit for protecting and restoring the quality of the environment in the United States.

Although one might assume that the cause of environmental protection would engender

universal support, it does have its detractors. One criticism that has been leveled against the movement is the claim that its predictions about the **dire** consequences of environmental damage have often been in error. Environmentalists counter this assertion by pointing out that their warnings have often brought about changes on the part of the public, the government and private industry, and that these changes prevented the predictions from being realized. However, just as it is often very difficult to gauge the impact of human activity on something as complex as the environment, it is equally difficult to determine which side is right in this debate. Because environmental issues cover such a wide range of concerns, this is a question that must be considered on a case by case basis. These voices of **dissent** have demonstrated to environmentalists the need to apply quantitative methods in assessing the extent of the destruction they have witnessed, or the degree to which their work has been manifested in actual improvement of the environment.

However vocal the critics of environmental protection efforts may be, given the very considerable body of environmental legislation that exists, it is safe to assume that their views do not represent the majority opinion. Private advocacy groups, the EPA, state legislatures and Congress have worked together to enact numerous laws regarding air and water quality, land use and waste management. That should be evidence enough of the broad extent of the popular support that underlies the movement.

1. On which of the following does the passage mainly focus?
(A) Earth Day's impact on the environmental movement.
(B) How to protect the environment of the planet.
(C) The environmental protection movement, and how it began.
(D) The success of the EPA in protecting natural resources.
2. The word **spurring** in the passage is closest in meaning to
(A) opposing (B) managing
(C) supporting (D) motivating
3. According to paragraph 2, why was the environmental protection movement so widely successful?
(A) It protected plants and animals people cared about.
(B) It functioned well at the local level.
(C) It voted unsympathetic politicians out of office.
(D) It forced ratification of important national laws.
4. Which president established the EPA?
(A) Roosevelt (B) Clinton
(C) Nixon (D) Obama
5. The word **spearheaded** in the passage is closest in meaning to
(A) led (B) inspired
(C) conceived (D) modified
6. According to paragraph 4, what was a common criticism of the environmental movement?
(A) It suggested measures that would harm the economy.
(B) Its predictions could not be prevented through practical action.
(C) That it lacked the support needed to make any real progress.
(D) The environmental damage it claimed was not seen.
7. According to the passage, what effect did the criticism of the environmental movement have?
(A) It caused the environmentalists to change their methods.
(B) It decreased federal assistance for environmental protection.
(C) It diminished popular support for the EPA.
(D) It revitalized support for the environmental protection movement.
8. Which of the sentences below best expresses the essential information in the underlined

sentence in the passage?

- (A) Critics of the movement were successful in dissuading many environmentalists from supporting some of the more drastic measures that had been suggested by questioning the quantitative methods they employed.
 - (B) Opponents of the environmental protection movement succeeded in getting the activists to take another, more objective, approach to substantiating their claims.
 - (C) People who disagreed with the environmentalists eventually were able to persuade many that the methods employed by the environmental movement were invalid and their conclusion incorrect.
 - (D) Members of environmental groups were reluctant to employ quantitative methods in assessing environmental damage because they felt the results might not substantiate their claims.
9. The word **dire** in the passage is closest in meaning to
- (A) unrealized
 - (B) possible
 - (C) grave
 - (D) imaginary
10. The word **dissent** in the passage is closest in meaning to
- (A) opposition
 - (B) support
 - (C) indifference
 - (D) ambivalence

四、Essay：(30 分)

Write an essay on the following topic: **Information technology in policing and its impacts**

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3. 禁用鉛筆作答，違者不予計分。

一、Vocabulary and Phrases into English or Chinese：(20 分)

- | | |
|------------|------------------------|
| 1. 認罪協商 | 6. red-handed offender |
| 2. 陰謀論 | 7. vehicle impoundment |
| 3. 炸彈客 | 8. security breach |
| 4. 自白 | 9. malefactor |
| 5. 舞水端中程飛彈 | 10. avian influenza |

二、Passage Translation：(30 分)

1. For many years, the law enforcement community has attempted to detect impaired drivers through numerous innovative efforts and measures. The problem of driving under the influence is well known throughout society, yet, even with all of the strategies used to remove these drivers from U.S. highways, it continues to cause needless and tragic loss of life each year. When will such madness end? When will society no longer tolerate drunk driving? Until that time, the law enforcement community must attempt to contain the carnage inflicted upon law-abiding citizens by impaired drivers.
2. 紐約市的美國銀行(Bank of America)遭到搶劫。兩名戴著面罩、武裝的搶匪進入銀行。有位女性共犯在幫助搶匪逃跑的車內等候他們。當搶匪跳到櫃台取走金錢後，其中一位搶匪進入金庫並企圖搶走更多的現金。很快地，搶匪離開了銀行，而在跳進車內時，掉了一包袋子。不久之後，一位制服巡邏員警發現這部協助嫌犯脫逃的車輛被棄置在距離銀行幾哩的地方。哪裡是第一犯罪現場？而哪裡又是第二犯罪現場？

三、Reading Comprehension：(20 分)

(I)

Internet dating has gone from daring to dull. As a result, many singles these days are looking to their cell phones instead of their laptops in an effort to locate love.

Cell phone technology now allows users to post tiny photographs and mini-profiles to a dating service mailbox, which can be visited by other cell phone users in search of a date. When a profile looks promising, users use their phones to send a text message to their person of interest.

Some phone dating services also are experimenting with ways to turn cell phone into homing devices. In other words, the phones can alert users to potential dates who may be just a short distance away — or, at the other end of the bar.

Europeans are heavily into phones dating, and China, which has 430 million cell phone users, also has embraced “mobile romance.”

The wireless service providers love phone dating, too, because all that text messaging pumps up their revenues. Analysts estimate that global mobile dating revenues were US \$31 million in 2005; by 2009, that figure is projected to reach US \$215 million.

Some people say that phone dating is more about flirting than about serious romance. “People who want to use their mobile devices are more interested in short-term relationships than people who want to use their computers,” said an officer of Match.com, a service with a quarter-million mobile users.

But, who really can say for sure. The next time the cell phones rings, it could be one calling Cupid.

1. Which is the function the dating service can offer through cell phones?
 - (A) Alerting users to potential dates.
 - (B) Increasing user’s revenues.
 - (C) Holding a wedding.
 - (D) Giving a gift to possible dates.
2. How can someone get information on any possible date on their cell phones?
 - (A) By asking the operator.
 - (B) By making an emergency call.
 - (C) By using a laptop.
 - (D) By looking at mini-photos in a dating mailbox.
3. Who may gain the most advantage of cell phone dating economically?
 - (A) Users.
 - (B) Possible dates.
 - (C) The wireless service suppliers.
 - (D) The store owners.

4. What are cell phone romance seekers often interested in?
- (A) Shorter-term relationship.
 - (B) Getting a new laptop.
 - (C) Finding other phone users.
 - (D) Short distance calling.
5. According to this passage, which of the following statements is **NOT** true?
- (A) Many unmarried people use their cell phones rather than laptops to locate love.
 - (B) Match.com has two hundred thousand mobile users,
 - (C) European people like phone dating.
 - (D) Internet dating has gone from daring to uninteresting.

(II)

Outstanding opportunity with local real estate corporation. Requires strong background in real estate, financing, closing. Some legal training helpful. Prefer candidate with M.A. and two or more years of successful real estate experience. Broker's license required. Salary range \$16,000-\$23,000 commensurate with education and experience. Begin immediately. Interviews will be conducted Tuesday and Thursday, June 10 and 12. Call for an appointment 243-1153, or send a letter of application and résumé to:

Personnel Department
Executive Real Estate Corporation
500 Capital Avenue
Lawrence, Kansas 67884

6. Which of the following is **NOT** a requirement for the job advertised?
- (A) At least two years experience.
 - (B) A broker's license.
 - (C) An M.A.
 - (D) Extensive legal training.
7. The salary range indicates that
- (A) everyone earns a beginning salary of \$16,000.
 - (B) the salary depends upon the amount of education and work experience that the applicant has.
 - (C) some applicants would earn less than \$16,000.
 - (D) candidates with an M.A. would earn \$23,000.

8. What should an interested candidate submit with his or her application?
- (A) A current address and telephone number.
 - (B) A signed contract.
 - (C) A summary of work experience.
 - (D) A request for employment.
9. This passage would most probably be found in
- (A) the classified section of a newspaper.
 - (B) a college catalog.
 - (C) a textbook.
 - (D) a dictionary.
10. Real estate employees would most probably
- (A) persuade people to buy insurance.
 - (B) sell houses.
 - (C) give professional opinions on personnel management.
 - (D) teach people how to do bookkeeping.

四、Essay：(30 分)

Write an essay on the following topic. The length of your essay should be no less than 100 words and no more than 200 words.

How to Create an Anti-Graft Society

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3. 禁用鉛筆作答，違者不予計分。

一、Vocabulary and Phrases translation：(20 分)

- 1、公部門
- 2、犯罪俚語
- 3、線民
- 4、引渡
- 5、鄰里守望相助計畫
- 6、a motor bike
- 7、acute stress disorder
- 8、cloned cars
- 9、electronic monitoring
- 10、intelligence apparatuses

二、Translation：(30 分)

- 1、We have investigated the alarm and there is a small fire on the fourth floor. The fire department has arrived and the fire has been contained. We are asking everyone to leave the building in an orderly fashion. Exit through stairwell B on the south side of the building.
- 2、As people start using their smart phones to tap into computer networks, the damage caused by malware could grow more severe. If smart phones serve as payment devices, malware that nabs your identity and taps directly into your credit line could follow.
- 3、In an unprecedented effort to save the species, South Africa has bought new ships equipped with top-of-the-line military night-vision equipment. They've also begun testing seized boats for DNA to prove they were used in abalone harvesting.

三、Reading Comprehension : (20 分)

Most people can remember a phone number for up to thirty seconds. When this short amount of time **elapses**, however, the numbers are erased from the memory. How did the information get there in the first place? Information that makes its way to the short term memory (STM) does so via the sensory storage area. The brain has a filter which only allows stimuli that is of immediate interest to pass on to the STM, also known as the working memory.

There is much debate about the capacity and duration of the short term memory. The most accepted theory comes from George A. Miller, a cognitive psychologist who suggested that humans can remember approximately seven chunks of information. A chunk is defined as a meaningful unit of information, such as a word or name rather than just a letter or number. Modern theorists suggest that one can increase the capacity of the short term memory by chunking, or classifying similar information together. By organizing information, one can optimize the STM, and improve the chances of a memory being passed on to long term storage.

When making a conscious effort to memorize something, such as information for an exam, many people engage in "rote rehearsal". By repeating something over and over again, one is able to keep a memory alive. Unfortunately, this type of memory maintenance only succeeds if there are no interruptions. As soon as a person stops rehearsing the information, it has the tendency to disappear. When a pen and paper are not handy, people often attempt to remember a phone number by repeating it aloud. If the doorbell rings or the dog barks to come in before a person has the opportunity to make a phone call, he will likely forget the number instantly. Therefore, rote rehearsal is not an efficient way to pass information from the short term to long term memory. A better way is to practice "**elaborate** rehearsal". This involves assigning semantic meaning to a piece of information so that it can be filed along with other pre-existing long term memories.

Encoding information semantically also makes **it** more retrievable. Retrieving information can be done by recognition or recall. Humans can easily recall memories that are stored in the long term memory and used often; however, if a memory seems to be forgotten, it may eventually be retrieved by prompting. The more **cues** a person is given (such as pictures), the more likely a memory can be retrieved. This is why multiple choice tests are often used for subjects that require a lot of memorization.

1、According to the passage, how do memories get transferred to the STM ?

- (A) They revert from the long term memory.
- (B) They enter via the nervous system.

- (C) They get chunked when they enter the brain.
(D) They are filtered from the sensory storage area.
- 2、The word **elapses** in paragraph 1 is closest in meaning to :
- (A) continues
(B) adds up
(C) appears
(D) passes
- 3、All of the following are mentioned as places in which memories are stored EXCEPT the :
- (A) STM
(B) long term memory
(C) sensory storage area
(D) maintenance area
- 4、Why does the author mention a dog's bark ?
- (A) To provide a type of interruption
(B) To give an example of a type of memory
(C) To prove that dogs have better memories than humans
(D) To compare another sound that is loud like a doorbell
- 5、How do theorists believe a person can remember more information in a short time ?
- (A) By organizing it
(B) By repeating it
(C) By giving it a name
(D) By drawing it
- 6、The author believes that rote rehearsal is :
- (A) the best way to remember something
(B) ineffective in the long run
(C) more efficient than chunking
(D) an unnecessary interruption
- 7、The word **it** in the last paragraph refers to :
- (A) encoding
(B) information
(C) semantics
(D) STM
- 8、The word **elaborate** in paragraph 3 is closest in meaning to :
- (A) pretty
(B) efficient
(C) complex
(D) regular
- 9、Which of the following is NOT supported by the passage ?

- (A) The working memory is the same as the short term memory.
 - (B) A memory is kept alive through constant repetition.
 - (C) Multiple choice exams are the most difficult.
 - (D) Cues help people to recognize information.
- 10、The word **cues** in the passage is closest in meaning to
- (A) clues
 - (B) questions
 - (C) images
 - (D) tests

四、Essay：(30 分)

Write an essay on the following topic. The length of your essay should be no less than 100 words and no more than 200 words. In your opinion, does "Sunflower Movement" create a new threat to Taiwan's national security?

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3. 禁用鉛筆作答，違者不予計分。

一、Vocabulary and Phrases：(20 分)

- | | |
|-----------|----------|
| (一) 輻射汙染 | (六) 司法互助 |
| (二) 自拍神器 | (七) 溫室效應 |
| (三) 事故現場 | (八) 恐怖攻擊 |
| (四) 警政署署長 | (九) 食安危機 |
| (五) 客機空難 | (十) 內線交易 |

二、Translation：(30 分)

- (一) For at least half a century, police have considered it important to cut to a minimum of their response times to crime calls. The faster the response, they have reasoned, the better the chances of catching the criminal at or near the scene of the crime. (10 分)
- (二) Officers shall not use their police power to resolve personal grievances (e.g. those involving the officer, family members, relatives, or friends) except under circumstances that would justify the use of self-defense, actions to prevent injury to another person, or when a serious offense has been committed that would justify an arrest. (10 分)
- (三) The essence of the police role in maintaining order is to reinforce the informal control mechanisms of the community itself. Areas where community controls break down are vulnerable to criminal investigation. (10 分)

三、Reading Comprehension：(20 分)

Another large-scale study conducted by William Spelman and Dale Brown and published in 1984 was also to challenge a core police assumption of that period – that improvement in rapid response to calls for service would lead to improvements in crime fighting. This study was developed in good part because of the findings of a prior investigation in Kansas City that found little support for the crime control effectiveness of rapid response to calls for service (Kansas City Police Department 1977). With support from the National Institute of Justice, Spelman and Brown investigated 4000 victims, witnesses, and bystanders in some 3300 serious crimes in four American cities. This was another major study in terms of the resources brought to bear and the methods used. Again it examined a strategy that was aided by technological advances in the twentieth century and that was central dogma of police administrators – that police must get to the scene of a crime quickly if they are to apprehend criminal offenders.

根據以上內容，用英文回答以下問題（每題 2 分）：

- （一）Spelman and Brown 的研究報告發表於哪一年？
- （二）在 Spelman and Brown 的研究之前，哪個城市警察局做過類似研究？
- （三）Spelman and Brown 的研究是在哪個部門的支持下進行？
- （四）Spelman and Brown 研究的實證資料係蒐集自幾個美國城市？

根據以上內容，用中文回答以下問題（每題 3 分）：

- （五）Spelman and Brown 所要挑戰的研究假設是什麼？
- （六）在 Spelman and Brown 研究之前的類似研究，有何研究發現？
- （七）Spelman and Brown 研究的實證資料來自 4000 個研究對象，這些研究對象是每個案件中的什麼人？
- （八）“dogma of police administrators”的意義為何？

四、Essay：(30 分)

Write an essay on the following topic. The length of your essay should be no less than 100 words and no more than 200 words.

“Mobile Police Station” and its Impacts

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3. 禁用鉛筆作答，違者不予計分。

一、近日來新聞報導許多關於「藝人吸毒」案件，由於藝人的高知名度，因此是反毒工作的一項指標；瞭解濫用藥物的種類，方能擬定好的反毒策略，也因為透過濫用藥物尿液檢測的程序及結果，使得原本否認吸毒者最後不得不承認。請回答下列吸食甲基安非他命之相關問題：

(一)說明甲基安非他命的理化性質？為何被濫用？(5 分)

(二)依濫用藥物尿液檢驗作業準則規定，尿液檢驗中如何才能判定甲基安非他命陽性反應，請說明原因？但若有高濃度的麻黃素干擾時，應如何處理？(10 分)

(三)說明甲基安非他命在體內代謝的主要路徑及產物？(10 分)

二、下列數種分子標記為刑事 DNA 實驗室經常分析的標的，請針對各分子標記所具有之多型特徵加以說明？各分子標記分析之結果在鑑識上有何應用價值？

(一) Y-STR

(二) Nuclear STR

(三) Mitochondrial D-loop

(四) Mitochondrial cytochrome b

(五) Amelogenin gene

三、纖維是環繞在我們日常生活中不可或缺的物质，請回答以下幾個關於纖維跡證的問題：

- (一)纖維是根據哪個理論可以當證物？
- (二)有哪些因素可決定纖維跡證的價值？
- (三)請用化學結構式與用途說明 Nomex 與 Kevlar 之分別。
- (四)如何分辨棉纖維、麻纖維與羊毛纖維？
- (五)如何萃取纖維上的染料？

四、請說明傅氏紅外線顯微光譜儀(Fourier transform infrared microspectrometer, Micro-FTIR)的基本構造和分析有機物質的基本原理。另請列舉三種Micro- FTIR在物證鑑識上之應用，並簡述各種應用之採樣、樣品處理以及分析樣品時儀器的偵測模式。

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一、今年四月間一份關於「服止咳藥水驗出嗎啡男判無罪」的報導如下：
請回答下列關於濫用藥物鑑定的問題？

服止咳藥水驗出嗎啡 男判無罪

有吸毒前科的戴姓男子驗尿時，被驗出有嗎啡等陽性反應，戴男供稱因感冒喝止咳藥水所致；板橋地院函詢法醫研究所，證實藥水含「鴉片酞」成分，採信他的說詞，日前判戴無罪。

根據板橋地方法院判決書指出，34 歲的戴男家住新北市新莊區，曾在民國 91 至 92 年間被查獲吸毒，服刑出獄後被轄區派出所列管，去年 4 月 7 日接受警方驗尿，被驗出有嗎啡、可待因等陽性反應，遭疑施用第 1 級毒品海洛因，檢方將他依毒品罪嫌起訴。

法院審理時，戴男矢口否認吸毒，供稱驗尿前幾天感冒，就診後有服用止咳藥水，應是藥水含嗎啡成分，才會呈現陽性反應。

法官將醫師的處方箋與尿液檢驗報告一併函詢法務部法醫研究所，確認止咳藥水中的「鴉片酞」含嗎啡及可待因成分，服用後受檢會產生嗎啡、可待因陽性反應。法官據此採信戴男說法，且無其他積極證據可認定戴男有施用毒品，因此判決戴男無罪。全案可上訴。

- (一)請說明鴉片類藥物(海洛因、嗎啡、可待因)的代謝過程(需繪出化學結構式)? (10 分)
- (二)請以均質性酵素免疫分析法說明濫用藥物尿液檢驗的初步檢驗原理?(10 分)
- (三)依濫用藥物尿液初步檢驗及確認檢驗結果，如何才能判定尿液中嗎啡、可待因陽性反應? 又如何才能確認吸食海洛因?(5 分)

二、請說明或解釋下列各項：(25分)

- (一) 請繪出及說明硝化甘油(nitroglycerin)形成之化學反應式。
- (二) 請繪出及說明尼龍 66 合成纖維之化學反應式。
- (三) 請說明以氫氟酸溶解玻璃的化學反應式。
- (四) 何謂磨滅值(removal depth)？
- (五) 何謂滯留指數(retention index)？

三、針對性侵害案件相關檢體之鑑定：(25分)

- (一) 刑案現場之生物跡證，若由精液初步試驗發現呈陽性反應，但經染色後以顯微鏡觀察並未發現有精蟲，請說明要如何進行確認？
- (二) 以毛細管電泳進行 STR 型別分析時，如何由電子訊號圖中研判其是否為混合檢體之圖譜？若研判其為混合檢體之圖譜，則該如何研判有幾人的 DNA 檢體包含在其中？若研判包含二人(一男一女)之 DNA，則該如何研判檢體中所含此二人 DNA 之比例？
- (三) 針對性侵害案件之混合檢體，若欲分別鑑定男女之 STR 型別，則該如何進行？

四、請說明何謂 VNTR、STR 與 SNP markers；並分別說明其偵測方法與在刑事鑑識上應用之優勢與限制。(25分)

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- 一、「槍砲彈藥刀械管制條例」所指槍砲彈藥之「殺傷力」之意義為何？「殺傷力」之判斷標準為何？另請說明鑑定（1）土改造槍枝、（2）土改造子彈、（3）氣動式槍枝（空氣槍）等物證之殺傷力之鑑定程序及方法，並請說明各鑑定方法之理論依據。
- 二、關於人類 DNA 鑑識，（一）請說明 DNA 多型性（polymorphism）之意義，並舉例繪圖敘述 DNA 多型性之類型。（二）請說明使用 ddNTP 進行 DNA 定序之基本原理，並繪圖說明其操作步驟。
- 三、嫌犯在現場所留下的潛伏指紋，必須藉助各種方法才能讓它成為肉眼能夠辨識的圖像，請舉出五種方法，並分別說明其原理。
- 四、傅立葉轉換（Fourier transform）已被廣泛地應用在各領域與科學儀器設備上，請說明其原理，並舉例說明如何應用在鑑識科學上（以方法或儀器應用說明）。

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一、依據「濫用藥物尿液檢驗作業準則」規定，在初步檢驗及確認檢驗中，如何判定安非他命類、鴉片類、愷他命類及古柯鹼類藥物之陽性反應？

二、在刑案現場中，指紋是經常會被發現及用來鑑定身分的物證，有關指紋的顯現及鑑定，請回答下列問題：

- (一)請說明真空金屬鍍膜法顯現潛伏指紋之原理？(5 分)
- (二)請說明指紋鑑定之 ACEV 原則？(10 分)
- (三)請以統計學的觀點，說明指紋「人各不同」之特性？(10 分)

三、目前國內已有多個鑑識實驗室通過 ISO/IEC 17025 之認證，而認證規範中即嚴格要求實驗室所用之方法必須經過 Validation，且要有參加 Proficiency test 之規劃。請說明：

- (一)何謂 Validation？並請以生物鑑識實驗室進行 STR 之鑑定為例，說明實驗室內部必須進行之 Validation 項目。(20 分)
- (二)何謂 Proficiency test？(5 分)

四、目前生物鑑識實驗室針對相關證物之身分鑑定及親子鑑定，皆以 STR 標記之分析為主要的鑑定系統，關於其數據之分析請回答下列問題：

- (一)何謂 Hardy-Weinberg equilibrium？若某證物之 TH01 及 D13S317 型別分析結果分別為(7, 9)及(11, 11)，而 TH01 之 allele 7 及 9 在族群中之分佈頻率分別為 P7 及 P9，D13S317 之 allele 11 在族群中之分佈頻率為 P11，請依據 Hardy-Weinberg equilibrium 計算該二個 STR 標記之基因型組合頻率。(15 分)
- (二)針對親子鑑定之案例中，以一個 STR 標記之鑑定為例，若 allele P、Q 及 R 在族群中之分佈頻率分別為 p、q 及 r，請分別計算下列二個案例之 PI (Paternity Index) 值。(10 分)

	系爭父親 (alleged father) 基因型	母 基因型	子 基因型
案例一	PR	QR	PQ
案例二	PR	無	PP

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一、依據「濫用藥物尿液檢驗作業準則」規定，濫用藥物尿液檢測先以免疫分析法 (Immunoassay) 做初步篩檢，呈陽性反應者，應再以氣相層析/質譜法 (Gas Chromatography/Mass Spectrometry, GC/MS) 進行確認分析，必須兩者均呈陽性反應，才能發陽性反應報告。據此，請回答下列相關問題：

- (一) 說明酵素彰顯免疫分析法 (Enzyme multiplied immunoassay technique, EMIT) 之原理及其為何僅能進行初步篩檢？(15 分)
- (二) 說明 GC/MS 之原理及其為何可進行確認分析？(10 分)

二、請說明或解釋下列各項：

- (一) 請說明何謂 Becke line 以及解釋其原理。
- (二) 請說明何謂內轉遞 (internal conversion) 與外轉遞 (external conversion)。
- (三) 請寫出胺基酸與寧海德林的反應機構。
- (四) 請說明 luminol test 的化學原理與反應方程式。
- (五) 請繪出及說明合成聚酯纖維的化學反應式。

三、有關以 Physical Developer (PD) 與 Ninhydrin 顯現潛伏指紋之比較，請回答下列問題：

- (一) 說明 PD 顯現潛伏指紋之反應機制、可能用到之關鍵試劑、其操作過程及應注意事項。(15 分)
- (二) 說明 Ninhydrin 顯現潛伏指紋之反應機制。(5 分)
- (三) 泡過水的紙張上之潛伏指紋，用上述何種方法顯現效果較佳？請說明原因。(5 分)

四、近年來許多毒販將 MDMA、一粒眠、K 他命或甲基安非他命等毒品加入「三合一咖啡包」、「奶茶包」或「紅茶包」中販售牟利，躲避查緝與吸引更多年輕學子嘗試，成為夜店或跑趴的「新鮮貨」。由於傳統的分析方式通常需要花上幾小時與數天時間才能確認其成分，因此以拉曼光譜儀分析藥毒物是近年來發展在第一現場就可以檢測可疑藥物的方法。

- (一) 請寫出 MDMA、一粒眠、K 他命及甲基安非他命的化學結構式。(8 分)
- (二) 請說明拉曼散射光譜基本原理和拉曼光譜儀基本構造。(12 分)
- (三) 如何以拉曼光譜儀判定 MDMA、一粒眠、K 他命及甲基安非他命之不同。(5 分)

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科 目：現場及證物處理

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一、關於槍擊案件之現場處理，請回答下述問題：

- (一)請敘述勘察人員利用碳膠黏取案發現場在場人或疑似涉案人雙手虎口之射擊殘跡，期望能夠提供何種訊息協助刑案偵查工作。
- (二)請敘述實務單位利用掃描式電子顯微鏡能譜分析法(SEM/EDX)鑑識雙手虎口射擊殘跡時，對射擊殘跡成分的認定標準為何？以該標準詮釋無毒子彈所產生的射擊殘跡時，會有何種結果？
- (三)請嘗試針對雙手虎口之射擊殘跡既有的鑑識方法提出修正或提出另一種鑑識方法，以提供更明確的訊息以協助刑案偵查工作。

二、關於刑案現場之拍攝，為達到現場照片曝光正確且精準呈現現場原貌，請回答下述問題：

- (一)單鏡反射式相機或單鏡反射式數位相機提供多種曝光模式，請分別描述其中手動模式(Manual Mode)與程式模式(Program Mode)如何決定曝光值，及兩者在刑案現場使用時的特點。
- (二)請描述程式模式(Program Mode)僅注重曝光正確的前提下，對刑案現場照片可能造成的影響。
- (三)振動會造成現場照片模糊，請描述可能的振動來源，及排除振動的「安全快門」觀念。

- 三、任何犯罪現場的處理必須採取有條不紊的勘查步驟，才是邁向偵查成功的關鍵，這些勘查步驟依犯罪性質不同而異，但卻有共同的特徵與原則，事先建立各種犯罪分類的「邏輯樹」，可在勘查或偵查期間避免錯誤的發生，請以「邏輯樹」的概念，說明「命案現場」的勘查應如何考量？
- 四、在某個命案現場，現場處理小組人員發現現場窗戶上的一塊油漆過的木板背面疑似沾有血跡，於是將它取下帶回實驗室以寧海德林處理，正好在油漆面發現有微弱的指(掌)紋印，請回答下列問題：
- (一)請以物證監管鍊(Chain of custody)的概念，說明要將木板取下帶回的現場物證應如何處理？(10 分)
- (二)說明以寧海德林顯現指(掌)紋的反應式？寧海德林顯現後微弱的指(掌)紋可以如何增顯(請以反應式說明)？(10 分)
- (三)增顯後的指(掌)紋如何進行螢光攝影？(5 分)

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一、行進中之自用小客車，遭右側人行道上之射擊者以 9 mm Luger 口徑半自動手槍擊中右前座車門，射擊之子彈為全金屬包衣彈，共擊中三槍，均貫穿車門擊中右前座之乘客。請(一)簡要敘述彈道重建之程序，(二)列舉可能造成重建之彈道偏誤的因素，並提出降低重建彈道偏誤的方法。(25 分)

二、請說明下列三種物證以非破壞性方法顯現之程序和原理，及其照相記錄方法。(25 分)

- (一)光滑地板上的灰塵鞋印。
- (二)從廁所垃圾桶內大量用過衛生紙中找出沾有精液斑的衛生紙。
- (三)可疑行李箱內疑似炸彈之結構。

三、在分屍現場中發現一處疑似被清洗過的地板，為辨識該地板是否確為分屍場所，請說明如何進行該地板上殘留微弱血跡的顯現，所用方法之顯現原理為何？並請說明如何進行顯現結果之攝影記錄？(25 分)

四、請解釋下列與「現場與證物處理」有關之名詞：(25 分)

- (一) Chain of Custody
- (二) Walk-through
- (三) Locard's Exchange Principle
- (四) Painting with Light
- (五) Admissibility of Evidence

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一、關於入室（住宅、公司及商店）竊盜案件之現場處理，請回答下述問題：

- （一）請敘述入室竊盜案件現場勘察的重點區域。（6 分）
- （二）請敘述 2 維鞋印的搜尋及採證方式，並說明鞋印能夠提供的刑案現場訊息。（12 分）
- （三）當現場鞋印跡證納入採證標的時，請敘述如何調整入室竊盜案件現場保全及勘察採證策略。（7 分）

二、關於刑案現場之拍攝，為達到現場照片曝光正確且精準呈現現場原貌，請回答下述問題：

- （一）相機條件鏡頭焦距 10mm 光圈 F5.6 快門 1/15 且在未使用三角架的情形下，拍攝鞋印近景可能會有何種結果？並說明原因？
- （二）請敘述何謂景深及說明影響景深的三個因素。
- （三）請敘述常用手動模式（Manual Mode）與程式模式（Program Mode）如何決定曝光值，及兩者在刑案現場攝影的優缺點。
- （四）請敘述偏光鏡在刑案現場攝影的應用。
- （五）請敘述閃光燈攝影時自動模式與 TTL 模式的測光方式有何不同。

三、在槍擊案件現場，可能逮捕到可疑嫌犯或查獲槍枝、子彈、彈頭、彈殼，以及在現場必須研判槍傷、射擊角度、先後射等等，藉以重建槍擊現場，釐清真相。請回答下列有關槍擊案件問題：

- （一）如何進行可疑嫌犯手上射擊殘跡之採取與鑑驗？（5 分）
- （二）如何研判人體受到槍傷之射入口與射出口？（5 分）
- （三）說明彈頭、彈殼上可能有哪些痕跡可供比對鑑驗？（5 分）
- （四）如何採取槍枝及子彈上之潛伏指紋？（10 分）

四、請說明下列物證之處理方法：

- (一) 如何顯現從水中撈起已沾滿泥沙刀子上之潛伏指紋？
- (二) 如何採取刑案現場之可疑纖維？
- (三) 如何比對兩種土壤之密度梯度？
- (四) 如何處理沾有血跡之深色牛仔褲？
- (五) 如何處理半燒焦鈔券？

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一、李昌鈺博士將刑案現場物證分成五類，請：

- (一) 列出分類名稱，並說明各類物證之特性。(10 分)
- (二) 每類列舉二種物證，說明各種物證在偵查審判之功能。(10 分)
- (三) 說明處理或使用各類物證時應特別注意之事項。(5 分)

二、關於現場疑似血斑或潛伏血斑之搜尋及初步試驗，請簡要回答：

- (一) 藍光光源搜尋血斑之基本原理及應用方法。
- (二) KM 試劑初步篩檢血斑之基本原理及應用方法。
- (三) 發光胺(Luminol)搜尋血斑之基本原理及應用方法。
- (四) 螢光素(Fluorescein)搜尋血斑之基本原理及應用方法。
- (五) 免疫分析法確認人血之基本原理及應用方法。

三、在某現場餐桌上發現一個透明玻璃杯，可能疑留有嫌犯之潛伏指紋，請以證據能力與證明力的角度，分析勘察人員應如何進行勘察採證工作，以確保所採指紋之證據能力？並說明如何提高所採指紋之證明力？

四、進行現場數位攝影時，常發生有色調偏差的情形，請說明可應用哪些方法加以避免？又現場進行閃光燈物證攝影時，常發生有光斑現象，嚴重影響影像的曝光品質，請說明可應用哪些方法加以改善？

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一、在一場熱鬧廟會中，有一位演員在酬神戲臺後方受傷送醫，其他演員聲稱是鞭炮炸傷，經醫院急救後在其右胸取出一顆彈頭。若你是鑑識人員，該如何進行現場勘察及重建？

二、竊盜案現場是鑑識人員處理最多的現場，其中指紋、鞋印痕是常見的物證，請回答下列問題：

- (一) 請描述靜電足跡採取器的原理。(5 分)
 - (二) 現場鞋印痕該如何拍攝？(5 分)
 - (三) 請描述反射式紫外光影像系統的原理。(5 分)
 - (四) 分析現場鞋印痕可提供何種訊息？(5 分)
 - (五) 現場採獲指紋後，該如何研判指位？(5 分)
- 三、民國 104 年 2 月 11-12 日高雄監獄 6 名受刑人搶得監獄槍彈挾持監獄官員事件，最後 6 名受刑人均因顛部致命性槍傷而死亡。請問負責現場處理及物證鑑定之鑑識人員應分別採取哪些跡證？進行哪些物證之鑑定？以便釐清 6 名受刑人究係舉槍自殺或遭其他人員擊斃？
- 四、請說明下列現場物證搜尋或處理方法之原理和應用範圍：
- (一) 金屬探測器
 - (二) 攜帶型穿透式 X 光照相設備
 - (三) 離子移動力圖譜法 (Ion mobility spectrometry)

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一、(a)寫出 NO_2 及 NO_2^- 之路易士結構(Lewis structure)。(4 分)

(b)比較兩物質之 O-N-O 之鍵角大小。(3 分)

(c)並說明原因。(3 分)

二、在 298°K 之下 HBrO 在水中之解離常數是： $K_a=2.3 \times 10^{-9}$ ，

(a)求 HBrO 在水中解離之 ΔG° 。(5 分)

(b)在下列濃度下其 ΔG 是多少？ $[\text{H}_3\text{O}^+] = 6.0 \times 10^{-4}\text{M}$ ， $[\text{BrO}^-] = 0.10\text{M}$ ， $[\text{HBrO}] = 0.20\text{M}$ 。(5 分)

三、一束光射入石英，這光包含兩個波長的單光，分別為 404nm 及 508nm，而兩個單光在石英的折射率分別是 1.469 及 1.462，當這光從空氣中(折射率 1.0003)與法線呈 32° 之角度射入石英後兩單光會被分開幾度？(10 分)

四、(a)轉錄的抑制性調控與活化性調控，有哪些基本的不同？(5 分)

(b)描述大腸桿菌中，調控乳糖操縱組轉錄的抑制性機制。(5 分)

五、一個人推檔案箱作等速運動，其運動距離是 3.1 公尺，箱重 85 公斤，地板與箱子的摩擦係數是 0.22，問：

- (a) 這人對這箱子作多少功？(4 分)
- (b) 摩擦力對箱子作多少功？(3 分)
- (c) 所有的力對這箱子共作多少功？(3 分)

六、A 12.0 kg block is pulled at constant speed on a table surface by a horizontal cord with a tension of 25.0 N. It was noticed that it initially required a tension of 35.0 N just to get the block started moving.

- (a) How large is the normal force of the table acting on the block?(5 分)
- (b) How large is the kinetic friction force while the block slides on the table? (5 分)

七、A 42.0 cm long string is vibrating at 1320 Hz in a standing wave with three loops.

- (a) What is the speed of the waves on the string? (5 分)
- (b) What is the fundamental resonance frequency of the string? (5 分)

八、Use enthalpy of formation data to compute standard enthalpy changes for the following reactions at 25 °C. State whether the reactions are endothermic or exothermic.

- (a) $\text{CO}_{(g)} + 2\text{H}_{2(g)} \rightarrow \text{CH}_3\text{OH}_{(l)}$ (5 分)
- (b) $\text{SO}_{2(g)} + (1/2)\text{O}_{2(g)} \rightarrow \text{SO}_{3(g)}$ (5 分)

九、Use Lewis structures and the VSEPR method to predict the molecular geometry and the bond angles of the following ions:

- (a) PO_4^{3-} (5 分)
- (b) IF_4^+ (5 分)

十、(a) What is the definition of a “hydrogen bond”? (5 分)

- (b) Rank bond strength of the following three hydrogen bonds (from the strongest to the weakest) $\text{F}-\text{H}\cdots\text{F}$, $\text{N}-\text{H}\cdots\text{O}$, and $\text{O}-\text{H}\cdots\text{O}$. (5 分)

參考資料

Conversions: Speed of sound in air (20°C): 343 m/s, 1 hp = 746 W, $G = 6.67 \times 10^{-11} \text{ N m}^2/\text{kg}^2$, $g = 9.80 \text{ m/s}^2$, $N_A = 6.022 \times 10^{23}/\text{mol}$, 1 kB = $1.38 \times 10^{-23} \text{ J/K}$, 1 cal = 4.186 J, 1 atm = 101.3 kPa.

Speed of light : $2.9979 \times 10^8 \text{ m/s}$

Planck's constant : $6.626 \times 10^{-34} \text{ Js}$

$E_n = -2.179 \times 10^{-18} \text{ J/n}^2$

Mass of a proton: $1.67262 \times 10^{-24} \text{ g}$

Mass of an electron: $9.10939 \times 10^{-28} \text{ g}$

$R = 0.082058 \text{ L atm / (mol K)} = 62.364 \text{ L torr / (mol K)} = 8.3145 \text{ J / (mol K)}$

Substance ΔH_f° , kJ/mol

CO(g) -110.5

CO₂(g) -393.5

CH₄(g) -74.81

CH₃OH(l) -238.7

SO₂(g) -296.8

SO₃(g) -395.7

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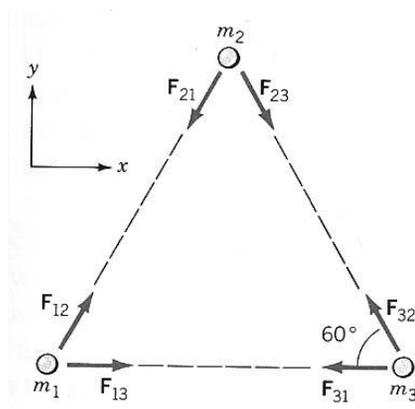
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一、A police car moves at 50 m/s in the same direction as a truck that has a speed of 30 m/s. The police siren has a frequency of 1500 Hz. What is the frequency heard by the truck driver when the police car is (a) behind the truck, or (b) ahead of the truck? Take the speed of sound to be 350 m/s. (10 分)

【Hint】： $f' = \left(\frac{v \pm v_o}{v \pm v_s} \right) f_o$

二、Three point particles with masse $m_1 = 8$ kg, $m_2 = 4$ kg, $m_3 = 6$ kg are at the corners of an equilateral triangle of side 2 m, as the figure shown below. Find the net force on m_2 . (10 分)

【Hint】： $F = \frac{Gm_1m_2}{r^2}$, $G = 6.67 \times 10^{-11} \text{ N} \cdot \text{m}^2/\text{kg}^2$.

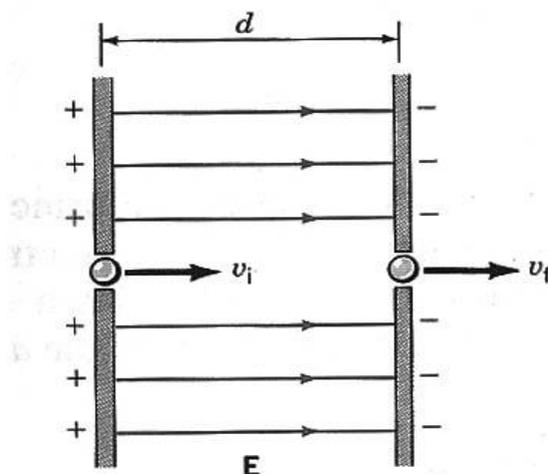


三、(a) A small object is placed 15 cm from a converging lens that has a focal length of 10 cm. Locate the image and determine its transverse

magnification. (b) An object of height 1 cm is located 15 cm from a diverging lens of focal length -10 cm. Locate the image and its height. (10 分)

- 四、A proton, of mass 1.67×10^{-27} kg, enters the region between two parallel plates a distance $d=30$ cm apart. There is a uniform electric field of 2×10^5 V/m between the plates, as the figure shown below. If the initial speed of the proton is $v_i = 5 \times 10^6$ m/s, what is its final speed v_f ? (10 分)

【Hint】: $\Delta V = \pm Ed$.



- 五、A 2000 kg car A moving east at 10 m/s collides with a 1000 kg car B moving west at 29 m/s. The collision is completely inelastic and takes place on an icy (frictionless) patch of road. (a) Find their common velocity after the collision. (b) What is the fractional loss in kinetic energy? (10 分)

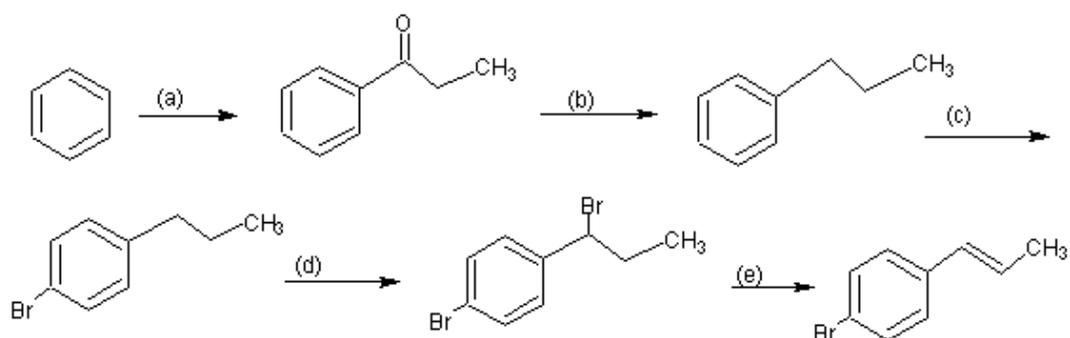
- 六、在 1.00 atm 及 22°C 時，0.0227 mol 某氣體體積為 660 mL，試問：
(10 分)

(一) 在 110°C ，體積膨脹為 900 mL 時，壓力為若干？

(二) 在 1.80 atm， 70°C 時，加入 0.0115 mol 氣體則體積為若干？

- 七、一個每毫米含有 1450 刻痕的紫外光階梯型光柵，用多波光束以 48° 入射角照射，請問在反射角為 $+20^\circ$ 與 $+10^\circ$ 度時，其一級與二級的輻射波長分別為多少？(10 分)

八、請寫出所需要的化學藥品(a)-(e)以完成下列的反應：（10分）



九、請解釋下列名詞：（10分）

- (一) Nucleotide
- (二) Short Tandem repeat
- (三) Primer
- (四) Complementary Base Pairing
- (五) Y-STR

十、何謂波長選擇器？請比較 interference filters 與 absorption filters 兩項之間的異同。（10分）

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高見公職預祝各位考生金榜題名

中央警察大學 102 學年度碩士班入學考試試題

所 別：鑑識科學研究所

科 目：自然科學

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3. 禁用鉛筆作答，違者不予計分。

一、請說明如何生產出具有胰島素（insulin）基因之基因轉殖細菌（transgenic bacteria）？並請說明如何選殖出可製造胰島素之品系（clone）？

二、請分別寫出 alkane、alkyne、cyclo-alkene、cyclo-alkane 及 naphthalene 之通式？

三、請解釋下列專有名詞：

- | | |
|---------------------------------|---------------------|
| (1) Avogadro's number | (2) Hybrid orbitals |
| (3) Equilibrium constant | (4) dissociation |
| (5) Pauli's exclusion principle | |

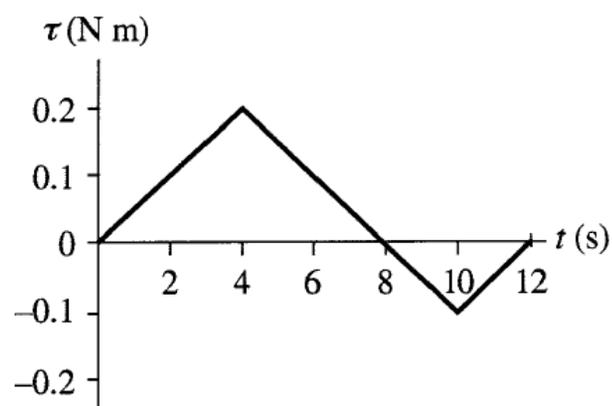
四、請說明下列數種醣類分子的構造：

- | | | |
|---------------|--------------|-------------|
| (1) cellulose | (2) glycogen | (3) amylose |
| (4) chitin | (5) lactose | |

五、一電子在電視機內之陰極射線管加速區內進行等加速度運動，在 3 公分的距離內，其速度由 2×10^4 公尺/秒增加至 1×10^7 公尺/秒，則電子在此加速距離需多少時間？此區域內電子之加速度為何？

六、A U-shaped tube is open to the air at both ends and is partially filled with Mercury (density= $13,600\text{kg/m}^3$). Water (density= 1000kg/m^3) is poured into the left arm until the water is 10.0cm deep. How far upward from its initial position does the mercury rise on the right side?

七、A 12-cm-diameter, 2.0 kg uniform circular disk, which is initially at rest, experiences the net torque shown in the figure below. What is the disk's angular velocity at $t=12\text{s}$? The disk rotates about an axis perpendicular to the plane of the disk and through its center. ($I_{\text{Disk}}=MR^2/2$)



八、Complete the following table.

Chemical Formula: SiF_4	Chemical Formula: NO_2^+
Lewis Structure:	Lewis Structure: <i>(nitrogen is the central atom)</i>
Molecular Geometry: <i>(words only, you do not have to draw the molecule in three dimensions)</i>	Molecular Geometry: <i>(words only, you do not have to draw the molecule in three dimensions)</i>
Molecular Polarity: (yes/no)	Molecular Polarity: (yes/no)
Bond Angle for F–Si–F	Bond Angle for O–N–O

九、Write the balance equation and the total ionic equation for the neutralization of phosphoric acid by calcium hydroxide.

十、請回答下列問題：

(一) Mongolism (Down's syndrome) is caused an extra chromosome #21 resulting from abnormal cell division in

- (a) asiatic people
- (b) black people
- (c) white people
- (d) any group

because it is not confined to any one group.

(二) Which is the correct sequence of steps in mitosis?

- (a) anaphase, metaphase, interphase, telophase, prophase
- (b) prophase, metaphase, telophase, interphase, anaphase
- (c) interphase, prophase, telophase, anaphase, metaphase
- (d) prophase, metaphase, anaphase, telophase, interphase

(三) A cross between a red rose and a white rose results in 100% pink.

When two of these pink roses are crossed, assuming large numbers of offspring, the ratio of offspring produced most probably will be

- (a) 100% pink
- (b) 75% pink ; 25% red
- (c) 25% red ; 50% pink ; 25% white
- (d) 50% red ; 50% white

Equations and Constants

$$\begin{aligned}
 N_A &= 6.022 \times 10^{23} \text{ mol}^{-1} & h &= 6.626 \times 10^{-34} \text{ J s} & c &= 2.998 \times 10^8 \text{ m s}^{-1} \\
 e &= 1.60 \times 10^{-19} \text{ C} & m_e &= 9.11 \times 10^{-31} \text{ kg} & 1 \text{ \AA} &= 1 \times 10^{-10} \text{ m} \\
 E_K &= \frac{1}{2} m v^2 & \Delta E &= h\nu & v\lambda &= c \\
 V &= \frac{\kappa Q_1 Q_2}{d} & \kappa &= 8.99 \times 10^9 \text{ J m C}^{-2} & E &= h\nu = \frac{1}{2} m v^2 + \Phi \\
 \mu &= Q r & 1 \text{ D} &= 3.34 \times 10^{-30} \text{ C m} & \tilde{\nu} &= \frac{1}{\lambda} \\
 \Delta E &= \frac{hc}{\lambda} = hc\tilde{\nu} & p &= \frac{h}{\lambda} & \lambda &= \frac{h}{mv} & \Delta x \Delta p &\geq \frac{h}{4\pi} \\
 \frac{1}{\lambda} &= R_H \left(\frac{1}{n_1} - \frac{1}{n_2} \right) & E &= 2.178 \times 10^{-18} \text{ J} \left(\frac{1}{n_1} - \frac{1}{n_2} \right) & \Delta E &= -2.178 \times 10^{-18} \text{ J} \left(\frac{1}{n_f} - \frac{1}{n_i} \right)
 \end{aligned}$$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
IA	IIA	IIIB	IVB	VB	VIB	VIIIB	---	VIII	---	IB	IIIB	IIIA	IVA	VA	VIA	VIIA	VIIIA
1A	2A	3B	4B	5B	6B	7B	---	8	---	1B	2B	3A	4A	5A	6A	7A	8A

1 <u>H</u> 1.008																	2 <u>He</u> 4.003
3 <u>Li</u> 6.941	4 <u>Be</u> 9.012											5 <u>B</u> 10.81	6 <u>C</u> 12.01	7 <u>N</u> 14.01	8 <u>O</u> 16.00	9 <u>F</u> 19.00	10 <u>Ne</u> 20.18
11 <u>Na</u> 22.99	12 <u>Mg</u> 24.31											13 <u>Al</u> 26.98	14 <u>Si</u> 28.09	15 <u>P</u> 30.97	16 <u>S</u> 32.07	17 <u>Cl</u> 35.45	18 <u>Ar</u> 39.95
19 <u>K</u> 39.10	20 <u>Ca</u> 40.08	21 <u>Sc</u> 44.96	22 <u>Ti</u> 47.88	23 <u>V</u> 50.94	24 <u>Cr</u> 52.00	25 <u>Mn</u> 54.94	26 <u>Fe</u> 55.85	27 <u>Co</u> 58.47	28 <u>Ni</u> 58.69	29 <u>Cu</u> 63.55	30 <u>Zn</u> 65.39	31 <u>Ga</u> 69.72	32 <u>Ge</u> 72.59	33 <u>As</u> 74.92	34 <u>Se</u> 78.96	35 <u>Br</u> 79.90	36 <u>Kr</u> 83.80
37 <u>Rb</u> 85.47	38 <u>Sr</u> 87.62	39 <u>Y</u> 88.91	40 <u>Zr</u> 91.22	41 <u>Nb</u> 92.91	42 <u>Mo</u> 95.94	43 <u>Tc</u> (98)	44 <u>Ru</u> 101.1	45 <u>Rh</u> 102.9	46 <u>Pd</u> 106.4	47 <u>Ag</u> 107.9	48 <u>Cd</u> 112.4	49 <u>In</u> 114.8	50 <u>Sn</u> 118.7	51 <u>Sb</u> 121.8	52 <u>Te</u> 127.6	53 <u>I</u> 126.9	54 <u>Xe</u> 131.3
55 <u>Cs</u> 132.9	56 <u>Ba</u> 137.3	57 <u>La*</u> 138.9	72 <u>Hf</u> 178.5	73 <u>Ta</u> 180.9	74 <u>W</u> 183.9	75 <u>Re</u> 186.2	76 <u>Os</u> 190.2	77 <u>Ir</u> 190.2	78 <u>Pt</u> 195.1	79 <u>Au</u> 197.0	80 <u>Hg</u> 200.5	81 <u>Tl</u> 204.4	82 <u>Pb</u> 207.2	83 <u>Bi</u> 209.0	84 <u>Po</u> (210)	85 <u>At</u> (210)	86 <u>Rn</u> (222)

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一、如何從以下的起始物質製備 pentylamine？(請寫出完整的方程式)

- (一) 1-butene
- (二) pentanenitrile

二、請說明下列數種胺基酸的結構式：

- (一) Leucine
- (二) Proline
- (三) Tryptophan
- (四) Lysine
- (五) Tyrosine

三、1-甲基環己醇與下列試劑反應會得到什麼產物？

- (一) HBr
- (二) NaH
- (三) H₂SO₄
- (四) Na₂Cr₂O₇
- (五) H₃O⁺

四、一片玻璃其折射率為 1.40 上覆蓋折射率為 1.55 的薄膜，使綠光

($\lambda=525\text{nm}$) 可優先通過，試問：

- (一) 薄膜之厚度最小應該為多少？
- (二) 哪種色光通過此玻璃時，其強度大量減低？

五、請提出符合下列條件的化合物：

MS：M⁺=88

IR：3380cm⁻¹

¹H NMR：0.85 δ (6H doublet); 1.40 δ (3H multiplier); 2.68 δ (1H single);
3.55 δ (2H triplet)

Broadband decoupled ¹³C NMR：22.7, 24.0, 41.8, 60.5 δ

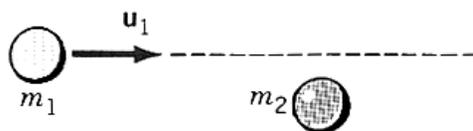
DEPT-90：25.0 δ

DEPT-135 : positive peaks at 22.7, 25 δ

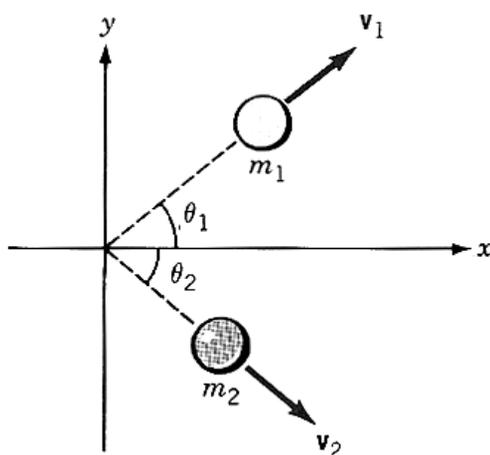
Negative peaks at 41.8, 60.5 δ

六、A proton moving at speed $u_1 = 5 \text{ km/s}$ makes an elastic collision with another proton initially at rest.

Given that $\theta_1 = 30^\circ$, find v_1 , v_2 , and θ_2 .



(a)



(b)

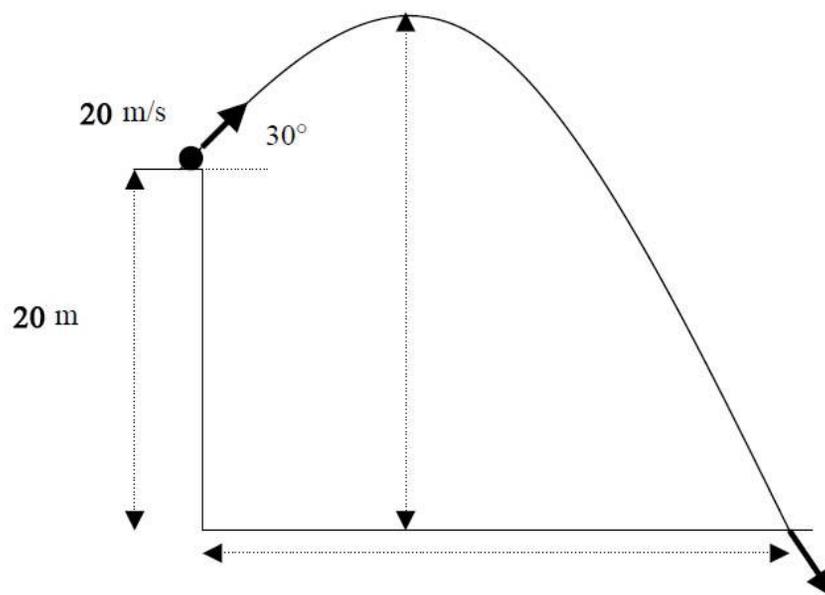
七、At $t = 0$ a pulse (traveling wave) is described by $y(x) = \frac{10}{5 + x^2}$. What is the function that describes it at an arbitrary time given that it moves in the $+x$ direction at 5 m/s ? Sketch the pulse at $t = 0, 1\text{s},$ and 2s .

八、As the figure shown below, a ball is thrown at 20 m/s at 30° above the horizontal from the top of a roof 20 m high. Find :

- (一) the time of flight
- (二) the horizontal range
- (三) the maximum height
- (四) the angle at which the ball hits the ground
- (五) the velocity when it is 2 m above the roof

【Hint】: 1.the magnitude of the acceleration due to gravity is 9.8 m/s^2 .

$$2. x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} .$$



九、In 1961, French microbiologists Jacob and Monod proposed the operon model to explain gene regulation. Please describe the elements of an operon.

十、Calculate the energies of one photon of ultraviolet ($\lambda = 1 \times 10^{-8} \text{ m}$), visible ($\lambda = 5 \times 10^{-7} \text{ m}$), and infrared ($\lambda = 1 \times 10^{-4} \text{ m}$) light. What do the answers indicate about the relationship between the wavelength and energy of light?

(Planck's constant $h = 6.626 \times 10^{-34} \text{ J}\cdot\text{s}$)

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一、寫出下列各化合物的結構：（每小題各 2 分）

- （一）2-methyl-2-butanol
- （二）cis-2,3-dimethyl-3-hexene
- （三）polypropylene
- （四）2,4,5-trimethylnornane
- （五）methyl ethanoate

二、一個人用槍射子彈，子彈以初速度 2000 m/s，與水平面 38° 的仰角射出，求：

- （一）這子彈在空中停留多少時間？（4 分）
- （二）子彈會射得多遠？（3 分）
- （三）子彈最高的高度是多少？（3 分）

三、試回答下列問題：（每小題各 5 分）

- （一）植物如何捕捉空氣中的碳原子？
- （二）植物如何建構葡萄糖？

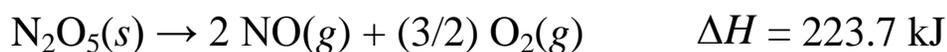
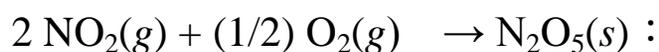
四、一個粒子的質量是 35g，它以 1.9m/s 的速度飛行，撞擊到一個靜止、質量是 78g 的粒子，互撞後兩個粒子的速度個別是多少（5 分）？其質量中心的速度是多少（假設兩個粒子是彈性碰撞）？（5 分）

五、已知氣體 CO (carbon monoxide) 與氯氣(Cl₂) 產生 COCl₂，請問：

- (一) 試由此反應的焓及吉布斯自由能來計算在 298K 下此反應之 ΔS° ($\Delta H^\circ = -220 \text{ KJ/mole}$, $\Delta G^\circ = -206 \text{ KJ/mole}$)。(5 分)
- (二) 假設此反應的 ΔS° and ΔH° 不會隨著溫度改變，試由此數據來計算此反應在 450 K 下之 ΔG° 值。(5 分)

六、Please describe the structures and functions of (a) chloroplasts(葉綠體) (b) mitochondria(粒腺體), respectively. And describe the similarities between them.

七、Nitrogen oxides undergo many interesting reactions in the environment and in industry. Given the following information, calculate ΔH for the overall equation



八、A ball thrown up from the ground reaches a maximum height of 30 m. Find:

- (一) its initial velocity
- (二) the time taken to reach the highest point
- (三) its velocity just before hitting the ground
- (四) its displacement between 1.5 and 2.5 s
- (五) the time at which it is 15 m above the ground

【Hint】： 1.The magnitude of the acceleration due to gravity is 9.8 m/s^2 .

$$2. \quad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} .$$

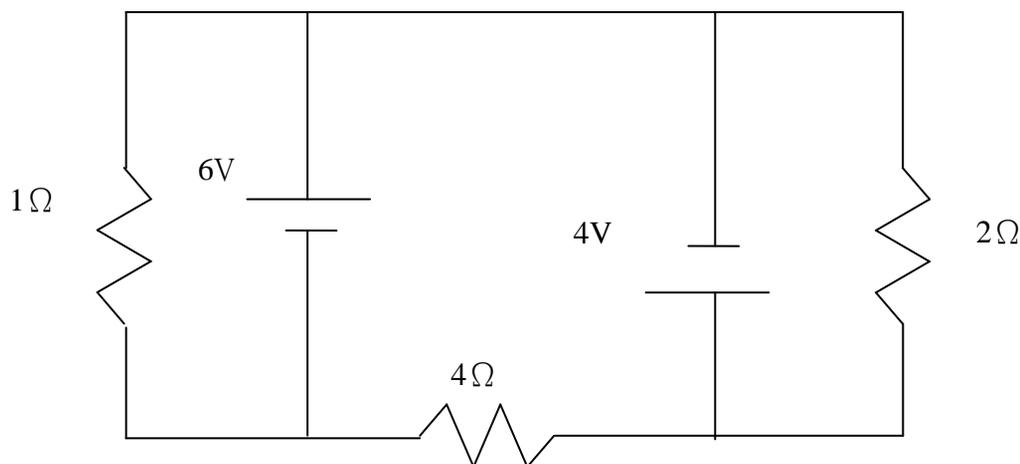
3. Equations of kinematics:

$$v = v_0 + at \quad x = x_0 + \frac{1}{2}(v_0 + v)t$$

$$x = x_0 + v_0t + \frac{1}{2}at^2 \quad v^2 = v_0^2 + 2a(x - x_0)$$

九、Atmospheric particulate matter is microscopic solid or liquid matter suspended in the Earth's atmosphere. It is also known as particulate matter (PM) or particulates. Please explain what PM2.5 is and how we apply it to air quality monitoring.

十、Find the current in each resistor as shown below.



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