

中央警察大學 113 學年度碩士班入學考試試題

所 別：各所
科 目：英文

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一、Vocabulary and Usage: Choose the best word or phrase to complete each sentence. (20 分)

1. Law enforcement agencies are increasingly prioritizing measures to combat the prevalence of _____, a form of harassment that involves unwanted and obsessive attention towards an individual.
(A) hacking (B) stalking (C) graffiti (D) jaywalking
2. The defendant claimed that the confession was made under _____, arguing that he was coerced into admitting guilt by threats of violence against his family.
(A) duress (B) consent (C) compliance (D) corroboration
3. The British Royal Family decided to sue a French magazine for publishing paparazzi photographs of their members and _____ their privacy.
(A) detecting (B) infringing (C) adventuring (D) violating
4. After the earthquake, the authorities ordered the immediate _____ of all buildings in the affected area.
(A) reinforcement (B) demolition
(C) evacuation (D) detention
5. A bomb _____ outside an elementary school and injured lots of passersby, prompting the city police to start investigating this case.
(A) set out (B) went off (C) lit up (D) put out

6. The defense attorney successfully argued that the evidence obtained through illegal search and seizure was _____ in court proceedings.
(A) adoptable (B) legitimate (C) inadmissible (D) reliable
7. Several gangsters involved in the assault of a police officer are still _____.
(A) out of hand (B) down to earth (C) at large (D) out of breath
8. Without permission, passengers are not allowed to stay within the _____ of MRT routes, stations, or trains during non-service hours.
(A) gratitude (B) confines (C) privilege (D) alliance
9. The city council allocated funds for the renovation of critical _____, including bridges, roads, and water supply systems.
(A) recreational facilities (B) attractions
(C) landmarks (D) infrastructure
10. The company's accountant was charged with _____, accused of unlawfully transferring company funds into her personal accounts.
(A) conspiracy (B) extortion (C) mischief (D) embezzlement

二、Translation : (30 分)

(一) 英譯中 (15 分)

Internet fraud, or cyber fraud, involves deceitful practices conducted over the internet to swindle individuals or organizations for financial gain. It encompasses a range of fraudulent activities, including phishing scams, identity theft, fake auctions, investment fraud, and credit card fraud. Perpetrators utilize sophisticated methods to trick victims into disclosing sensitive information or transferring money, posing substantial risks to personal and financial security.

(二) 中譯英 (15 分)

毒品販運活動對社會造成了嚴重的影響，包括犯罪率上升、社會穩定受到威脅以及人民健康問題增加。為此，政府加大了對毒品販運的打擊力度，提高了刑事懲罰和查緝行動，並加強邊境巡邏及國際合作以打擊販毒集團的行動。

三、Reading Comprehension and Cloze Test : (20 分)

(一) Reading Comprehension : After reading the passage, choose the best answer to each question. (10 分)

We have been cautioned that whether cell phone conversation is simply small talk with our friends or the making of a complex financial deal, when we are behind the wheel, it distracts us from the business at hand. Researchers have found out exactly why. The brain has limited capacity to handle multiple tasks simultaneously, leading to compromised processing of visual signals when engaged in a conversation. With visual and auditory signals competing, a driver's ability to see and react to what's ahead--even when gazing directly at a car, sign or pedestrian--is diminished. This phenomenon of "inattention blindness," in which the brain doesn't fully process what the eyes are taking in, helps explain how cell phone conversations distract drivers and contribute to an increasing number of accidents.

With over 330 million cell phone subscribers in the U.S., studies indicate that a significant portion of them use their phones behind the wheel. "Looking and seeing aren't one and the same," said University of Utah psychologist David Strayer, who has spent five years studying how the use of cellular phones affect driving. "Your eyes being directed at something doesn't mean you're processing it. Looking means paying attention. When you're not attending to driving, you're more of a hazard." With a conversation diverting their attention from the road, drivers are unable to react quickly to sudden events such as a child running into their path or a light change. The damage occurs equally with handheld or hands-free models. That suggests the problem lies in the distraction of the conversation, not in the holding of the phone.

1. What is the best title for this passage?
 - (A) The Hazards of Cell Phone Conversations While Driving
 - (B) The Benefits of Hands-Free Models in Driving Safety
 - (C) Exploring the Cognitive Impact of Multitasking While Driving
 - (D) The Role of Cell Phones in Car Accidents

2. How does University of Utah psychologist David Strayer characterize the difference between “looking” and “seeing” in the context of driving?
 - (A) Looking means paying attention, while seeing means being distracted.
 - (B) Looking implies processing visual signals, while seeing implies visual distraction.
 - (C) Looking and seeing are synonymous in the context of driving.
 - (D) Looking involves gazing directly at objects, while seeing involves understanding the road environment.

3. What is the definition of the term “inattention blindness” as described in the passage?
 - (A) A condition where one is blind to certain visual stimuli while driving
 - (B) A phenomenon where one's visual perception is hindered due to lack of attention
 - (C) A cognitive state where one becomes hyper-aware of surrounding distractions
 - (D) A neurological disorder affecting the eye's ability to process visual information

4. According to the author, what is the real cause behind all the cell phone-related accidents?
- (A) The act of holding the cell phone.
 - (B) The cause is still unknown.
 - (C) The phone conversation itself.
 - (D) Drivers cannot see what is ahead of them.
5. According to the passage, why does engaging in cell phone conversation while driving lead to distraction?
- (A) Because it increases the visual processing capacity of the brain.
 - (B) Because it reduces the brain's ability to process visual signals.
 - (C) Because it enhances the driver's reaction time.
 - (D) Because it improves the driver's attention to the road.

(二) Cloze Test : Choose the best words or phrases to complete the following passage. (10分)

Taiwan was struck by a devastating earthquake on April 3, which had a significant impact on the eastern coast and the city of Hualien. ___1___ the chaos and destruction, the brave efforts of emergency responders, including police and specialized search and rescue teams, emerged as beacons of hope amid the crisis.

The ___2___ of the Hualien earthquake unfolded rapidly, demanding quick and decisive action from rescue teams. Rescuers ___3___ collapsed buildings, risking their lives to extract survivors trapped beneath the rubble. With every moment crucial, these courageous individuals displayed remarkable courage and determination in their rescue missions.

Alongside the search and rescue workers, police officers played a ___4___ role in maintaining order and coordinating rescue operations. Despite the dangers posed by aftershocks and unstable structures, these valiant professionals remained steadfast in their commitment to saving lives.

Notably, the indispensable contribution of rescue dogs cannot be overstated. Highly trained and incredibly resolute, these ___5___ heroes sniffed out survivors buried deep within the debris, guiding rescue teams to locations where human senses alone could not penetrate. Their unwavering dedication and fortitude exemplified the true spirit of service and sacrifice.

- 1.(A) Despite (B) In accordance with
(C) While (D) In terms of
- 2.(A) onset (B) aftermath (C) magnitude (D) afterwards
- 3.(A) plunged into (B) bumped into
(C) indulged into (D) ventured into
- 4.(A) redundant (B) optional (C) capricious (D) pivotal
- 5.(A) feline (B) canine (C) rodent (D) equine

四、Essay : (30 分)

Write a short essay on the following topic. The length of the essay should be no less than 100 words and no more than 250 words.

The pros and cons of being a police officer - from the perspective of the general public.

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科 目：火災科學

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4. 不需使用計算機，可用中文答題。

一、Find the general solution：

(一) $y' = 3x^2 - \frac{y}{x}$; $y(1) = 5$ (8 分)

(二) $xy' - \frac{y^2}{x} = y$ (8 分)

(三) $y' + \frac{1}{x}y = \frac{1}{x^4}y^{-3/4}$ (9 分)

二、研究建築物火災問題時，經常要得到火場中空氣密度 (ρ ，單位： kg/m^3) 與溫度 (T ，單位： K) 的值，然而火場空氣密度 (ρ) 與火場空間內的溫度 (T) 是有相互關聯，請推導出火場空氣密度與火場溫度兩者相乘積 (ρT) 的值，大約是多少？在此，假設火場是在一大氣壓下 ($P_{\text{atm}}=1.01 \times 10^5 \text{ Pa}$)，空氣的平均分子量為 28.97 g/mol ，理想氣體常數為 8.31 J/mol.K 。

三、海龍滅火設備對滅火及環境之影響，請依序回答下列問題：

- (一) 請說明海龍滅火設備之滅火原理及環境之傷害？並舉例說明其命名規則。
- (二) 海龍替代品滅火設備對於臭氧層及溫室效應之影響為何？

四、有關突沸 boilover 之火災現象，請依序回答下列問題：

(一) 請闡述突沸 boilover 之原理？

(二) 突沸 boilover 之徵兆？

(三) 對救災人員之危害？

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所 別：消防科學研究所
科 目：消防安全設備與檢查

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- 一、世界各國火災統計幾乎均指出，建築物火災每年致死人數，均以「住宅類用途使用空間」高居第一。試問住宅火災安全防護專用的撒水頭(residential sprinklers)，與臺灣一般常用的法定撒水頭，在設計目的、撒水分佈態樣、系統構件、放射壓力與流量/密度等有何差異？試申論之。
- 二、消防署中央災害應變中心曾發生夜間火災災例，即使所設氣體藥劑自動滅火設備全區放射，卻仍造成機具損失、資料流失與部分營運中斷的重大事件。試問關鍵風險因子為何？此類 data center 及其周邊適合的滅火設備為何？請申論之。
- 三、有一供資訊科技研發使用之建築物(地上 15 層地下 3 層)，各層樓高約 4 公尺，其中地上 12 層供資訊中心使用，該樓地板面積為 1,600 平方公尺，設置有惰性氣體(IG-541)滅火設備，請繪製其化學滅火設備構造昇位圖及動作流程圖？請寫出有關 IG-541 滅火設備之藥劑化學式及安全濃度值、人體傷害值、溫室效應係數、熱分解生成物、設計濃度與計算公式等規定？其在個案申請審核認可時應注意事項為何？並依照「消防安全設備及必要檢修項目檢修基準」規定，應如何進行該化學滅火設備的性能檢查？

四、某一大樓第 2 層供美術館使用，該樓地板面積為 4,500.8 平方公尺，從業員工有 90 人，閱覽室、展示室、展覽室、會議室及休息室之樓地板面積和為 600 平方公尺，其收容人數應為多少？至少應設置多少具避難器具？依據「消防安全設備及必要檢修項目檢修基準」規定，請說明有關該避難器具之操作面積、下降空地及性能檢查等應注意事項及判定方法？

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- 一、火場救災指揮決斷（size-up）是火場指揮相當重要的程序之一，請以某消防分隊接獲轄內一高爾夫球代工工廠火災為例，說明初期消防救災指揮官到達火災現場時，火場救災指揮決斷的意義與過程為何？
- 二、近年來火災現場屢傳消防人員因救災導致傷亡的案例，為強化消防人員的火場救災安全，消防機關也有許多具體的措施。請以內政部消防署出版的救災安全手冊為例，說明該手冊第一章中對於國內現行建立救災安全的重要方案策略有哪些具體的做法。
- 三、2023 年底新竹縣發生消防分隊長入室搜索受困不幸殉職的事故，為避免憾事再次發生，請針對該項任務前準備、執行搜救中、退出火場以及迷失受困等過程，說明所需注意的事項。
- 四、有關消防安全檢查協助通報建築管理事業主管機關處理，已由「消防機關辦理消防安全檢查注意事項」中移除，如消防檢查時，遇有公共安全相關缺失，要如何處理？（10 分）在消防檢查時，常見的建築物公共安全缺失又有哪些？（15 分）

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一、求下列各極限：

(一) $\lim_{x \rightarrow 0} \frac{\sin x - \tan x}{x^3}$ 。(12 分)

(二) $\lim_{x \rightarrow 0} \frac{1 - \cos x}{x \ln(1+x)}$ 。(13 分)

二、請回答下列問題：

(一) 請證明 $\frac{d}{dx} \sin^{-1} x = \frac{1}{\sqrt{1-x^2}}$ ， $|x| < 1$ 。(13 分)

(二) 若 $y = \tan^{-1}(x - \sqrt{x^2 + 1})$ ，求 $\frac{dy}{dx}$ 。(12 分)

三、請回答下列問題：

(一) 求 $\int_1^{\infty} (1-2x)e^{-2x} dx = ?$ (13 分)

(二) 求 $y = \frac{(x-2)^3}{(x^2+1)^{1/3}}$ ， $x \neq 2$ 的導函數。(12 分)

四、請回答下列問題：

(一) 室溫（環境溫度）維持在 60°F ，如果某物從 100°F 降到 90°F 費時 10 分鐘，請問該物從 90°F 降至 70°F 還需要多少時間？
($\ln 2=0.6931$, $\ln 3=1.0986$, $\ln 4=1.3863$) (13 分)

(二) 求函數圖形在其指定區間的弧長：(12 分)

$$8y = x^4 + 2/x^2, \quad [1, 4]$$

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