國立中山大學113學年度
碩士班暨碩士在職專班招生考試試題

科目名稱：作業系統【資工系資安碩班碩士班】

—作答注意事項—

考試時間：100分鐘

- **考試開始鈴響前不得翻閱試題，並不得書寫、劃記、作答。**請先檢查答案卷（卡）之應考證號碼、桌角號碼、應試科目是否正確，如有不同立即請監試人員處理。
- **答案卷限用藍、黑色筆(含鉛筆)書寫、繪圖或標示**，可攜帶橡皮擦、無色透明無文字墊板、尺規、修正液（帶）、手錶(未附計算器者)。每人每節限使用一份答案卷，請衡酌作答。
- 答案卡請以2B鉛筆劃記，不可使用修正液（帶）塗改，未使用2B鉛筆、劃記太輕或污損致光學閱讀機無法辨識答案者，後果由考生自負。
- 答案卷（卡）應保持清潔完整，不得折疊、破壞或塗改應考證號碼及條碼，亦不得書寫考生姓名、應考證號碼或與答案無關之任何文字或符號。
- 可否使用計算機請依試題資訊內標註為準，如「可以」使用，廠牌、功能不拘，唯不得攜帶書籍、紙張（應考證不得做計算紙書寫）、具有通訊、記憶、傳輸或收發等功能之相關電子產品或其他有礙試場安寧、考試公平之各類器材入場。
- **試題及答案卷（卡）請務必繳回，未繳回者該科成績以零分計算。**
- **試題採雙面列印，考生應注意試題頁數確實作答。**
- **違規者依本校招生考試試場規則及違規處理辦法處理。**

國立中山大學113學年度碩士班暨碩士在職專班招生考試試題

科目名稱：作業系統【資工系資安碩班碩士班】　　題號：485002

※本科目依簡章規定「不可以」使用計算機(問答申論題)　　共1頁第1頁

INSTRUCTIONS: If any question is unclear or you believe some assumptions need to be made, state your assumptions clearly at the beginning of your answer.

1. [Operating System: 80%]

(1) Many criteria are used for measuring the performance of CPU-scheduling algorithms. (20%)
   a. Please explain the functionalities of the following criteria: 1). CPU utilization, 2). throughput, 3). turnaround time, 4). waiting time, and 5). response time. (10%)
   b. Please explain the following scheduling algorithms: 1). first-come, first-served (FCFS), 2). shortest-job-first (SJF), 3). priority, 4). round-robin, 5). multilevel queue, and 6). multilevel feedback queue. (10%)

(2) Please explain the basic idea of redundant array of independent disks (RAID) and the levels of RAID from RAID 0 to RAID 6. Note that descriptions and figures are required to depict all these levels. (20%)

(3) A client machine of a distributed system may need some approaches, be it client-initiated or server-initiated, to verify whether a locally cached copy of data is consistent with the copy on the master machine. Please explain the basic idea of client-initiated and server-initiated approaches and how they work. (10%)

(4) Please show and explain the critical-section problem first and then explain the requirements of mutual exclusion, progress, and bounded waiting. (10%)

(5) Various types of hardware failure can be found in a distributed system. Thus, to ensure that the distributed system is robust, we must detect these failures, reconfigure the system so that it can continue running, and recover when a site or a link is repaired. Please explain the following terms: failure detection, reconfiguration, recovery from failure, and fault tolerance. (20%)

2. [Security: 20%]

(1) Explain what is Adversarial Example Attacks? (3%)
(2) Explain what is Zero Trust Architecture (ZTA)? (3%)
(3) Explain what is Privacy Enhancing Technology (PET)? (3%)
(4) Explain what is Multi-Factor Authentication (MFA)? (3%)
(5) Please describe what is a Grayware? (3%)
(6) Please explain what the concept of end-to-end security for Instant Messenger apps is and how to achieve it. (5%)