

國立中央大學 109 學年度碩士班考試入學試題

所別： 資訊管理暨大數據分析類

共 2 頁 第 1 頁

科目： 計算機概論

本科考試禁用計算器

*請在答案卷(卡)內作答

第一題： 解釋名詞（每題 5 分，共 25 分）

- (A) CDMA (Code Division Multiple Access)
- (B) ARP poison attack
- (C) ICMP (Internet Control Message Protocol)
- (D) MPLS (Multi-Protocol Label Switch)
- (E) Reverse proxy server

第二題(共 25 分): Sometimes we wish to store passwords in a database. When storing passwords, we need to take extra considerations in the database design.

- (A) (10 分) Read the following statements. Place a tick in the box if the statement is true, otherwise place a cross.

<input type="checkbox"/>	• Password hashing can protect the website from being breached.
<input type="checkbox"/>	• It's possible for a hashing algorithm to have a collision or a clash.
<input type="checkbox"/>	• A hash is a string or number generated from a string of text.
<input type="checkbox"/>	• The best hashing algorithms are designed so that it's impossible to turn a hash back into its original string.
<input type="checkbox"/>	• When a hash algorithm is given the same input, the same output is always produced.
<input type="checkbox"/>	• Password hashing must be done on the client-side where the user enters the password.
<input type="checkbox"/>	• Fast hashing functions such as MD5, SHA1 are safer than slow hashing algorithms.
<input type="checkbox"/>	• A copy of the plain password should be stored securely in the database in case the user forgets his/her password.
<input type="checkbox"/>	• If password hashing is done on the client-side, it must be done again on the server-side.
<input type="checkbox"/>	• Hashing and Encryption are the same.

- (B) (15 分) What is a salt? And why is it important when hashing a password?

參考用

注意：背面有試題

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第三題: (5 分) Choose the correct answer(s) regarding interface and abstract class in Java. [single or multiple choices]

- (a) They are the same.
- (b) Both can have constants as their attributes.
- (c) An abstract class is used in Java to realize multiple inheritances.
- (d) An interface cannot define any method implementation, but an abstract class can.
- (e) To have any instance of their type instantiated, they both need other class(es).

第四題: (20 分) Many programs written with inheritance could be written with composition instead. Please provide an example of rewriting a program with inheritance to a program with composition, and compare the pro and cons of both approaches and examples. Your examples should be of the appropriate depth for illustration.

第五題: (5 分) Please draw the diagram of process state.

第六題: (4 分) What is four conditions of deadlock occurring?

第七題: (4 分) Please explain the Belady's Anomaly. Which page replacement algorithm will suffer this fatal problem?

第八題: (6 分) Without any doubt, real-time scheduler must support preemptive and priority-based scheduling. For hard real-time scheduling must provide ability to meet deadlines. Given two processes P_1 and P_2 , the periodic generated time of P_1 and P_2 are $p_1=50$ and $p_2=80$, respectively. And the processing time of P_1 and P_2 are $t_1=25$ and $t_2=35$, respectively.

- (A) Can these two processes be scheduled using rate-monotonic scheduling? Why?
- (B) Can these two processes be scheduled using earliest-deadline-first scheduling (EDF)? Why?

第九題: (6 分) In a paging system, suppose that the hit ratio is 80% and it takes 10 ns to search the TLB and 200 ns to access memory.

- (A) What is the effective memory access time with single-level page table?
- (B) What is the effective memory access time with three-level page table?

參考用

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