

國立成功大學

111學年度碩士班招生考試試題

編 號：157

系 所：生物醫學工程學系

科 目：計算機概論

日 期：0219

節 次：第 2 節

備 註：不可使用計算機

※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. (30%) Briefly describe the following terms:
 - (a). *Application Layer, Data-link Layer and Network Layer*
 - (b). *Abstraction and Inheritance* of OOP (Object-Oriented Programming)
 - (c). *Run-length Encoding* of Data Compression
2. (10%) An operating system uses virtual memory but requires the whole program to be in physical memory during execution without paging or segmentation. The size of physical and virtual memory is 4 GB and 10 GB, respectively. How many programs of size 100 MB can be run concurrently by this operating system and how much is in memory and disk?
3. (10%) Write an algorithm in pseudocode for the selection sort using a subalgorithm to find the smallest integer in the unsorted sublist.
4. (15%) During the global pandemic, prevention actions such as wearing masks, taking body temperature, and hand disinfection in public are very important. Please find a method that uses AI with wireless transmission mode to detect behaviors that might go against epidemic prevention regulations or help in reducing infections. Moreover, explain its operating principle, how is its data transmitted and kept secured.
5. (10%) Write a C++ function of “smaller (A, B, S)” where A and B is the input value, and S will be the smaller output value of A and B that would be passed to the main program.
6. (5%) Draw a diagram that shows a student record using linked list of data structure. Three fields: *id*, *name*, and *grade* should be included in the data part of the student record.
7. (10%) Write an algorithm in pseudocode for binary search on an 1D array of N elements.
8. (10%) Which key of asymmetric-key cryptography is used for decryption? Is the asymmetric-key cryptography suitable to apply on large messages? Explain your reasons.