

國立成功大學

113學年度碩士班招生考試試題

編 號：154

系 所：生物醫學工程學系

科 目：計算機概論

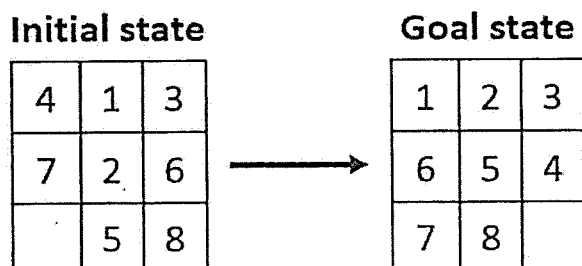
日 期：0201

節 次：第 2 節

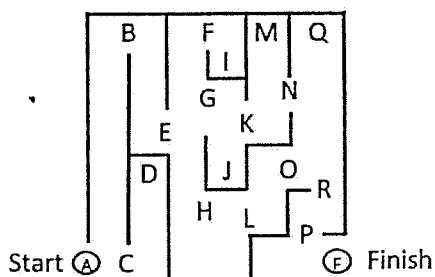
備 註：不可使用計算機

※ 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. (10%) The initial and goal states of an 8-puzzle are shown in the figure below. Design a heuristic method and a search tree for solving the puzzle.



2. (10%) Draw the tree and show a depth-first search for the problem below.



3. (15%) In the medical field, Loss Less Compression Methods are crucial as they can prevent data distortion. Please explain Run-length Encoding, Huffman Coding, and Lempel Ziv Encoding separately, and provide an example for each term.
4. (10%) Write a pseudocode of an algorithm using while loops to move the contents of stack S1 to S2. After the operation, stack S1 should be empty. You can use pop() and push() functions to represent this pseudocode.

5. (10%) Convert the following decimal, hexadecimal, or binary numbers to octal without using a calculator, and show your work.
 $(11.4)_{10}$, $(51A.C)_{16}$, $(4E1.DF)_{16}$, $(011110.011)_2$, $(111111.11101)_2$,

6. (10%) Write a pseudocode algorithm for the binary search that includes conditions for algorithm termination if the target is found or not found.

7. (10%) Please provide a brief answer on how to prevent the occurrence of deadlock situations in system processing procedures, include examples for illustration.

8. (10%) Please provide a brief answers for Object-Oriented Programming (OOP) and the Open Systems Interconnection model (OSI model).

9. (10%) NCKU Hospital has a medical X-ray imaging system with a resolution of 3056×3808 and a grayscale depth of 16 bits. What Mbps of transmission rate is required to ensure the dynamic imaging of X-rays can be maintained at 24 frames per second (fps)?

10. (5%) Please provide a brief explanation of Shortest Job First (SJF) in the CPU scheduling process, along with its advantages and disadvantages.