國立政治大學 111 學年度 碩士暨碩士在職專班 招生考試試題

考試科目	計算機概論與程式設計	系所別	數位內容碩士學位學程 資訊應用組	考試時間	2月 9日(三) 第二節

Please answer the following questions. For answers in code, any programming language (but not mixed) or pseudocode is allowed. (100%)

1. Please sort the following hardware components from the shorter to longer response time as a memory hierarchy. (Magnetic tape, RAM, SSD, register, CD, cache, and HDD) Please note which of it/them is/are on the CPU, and which of it/them is/are volatile and non-volatile. (10%) Please define what is volatile and non-volatile memory. (5%)

2. What are the four key features in object-oriented programming (OOP)? Please describe them. (10%) Please describe what is the difference among **public**, **private** and **protected** members. (5%)

3. Please draw the process life cycle diagram, including five states and six transitions, and describe them. (15%)

4. Please write down pseudocode of Fibonacci number in both iterative and recursive approaches, where fib (1) = 1, fib (2) = 1 and fib (3) = 2. What is the time and space complexity of them (in big-O natation)? Describe the reasons or calculating procedure. (12%) How many times the Fibonacci number function is called when the input argument is 6. Please write down and draw the procedure conceptually. (8%)

5. Please describe what is Non-Fungible Token (NFT) and metaverse, and how do they influence the current or future daily lives. (15%)

6. Please write down pseudocode of Bubble sort. When the elements in the input array are {29, 14, 17, 4, 53, 31}, write down or draw the procedure of sorting. What is the time and space complexity of it (in big-O natation)? (20%)

備註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。