

國立成功大學

113學年度碩士班招生考試試題

編 號： 190

系 所： 製造資訊與系統研究所

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。

Short answer questions, please respond to each question with 50 to 100 words.

A. Cyber Physical System Concepts : (10%)

A.1 What is a Cyber-Physical System (CPS), and how does it integrate computational elements with physical processes? (5%)

A.2 Provide an example of a Cyber-Physical System and explain its benefits. (5%)

B. Human Computer Interaction Concepts: (10%)

B.1 Define Human-Computer Interaction (HCI) and explain its importance in the design of interactive systems. (5%)

B.2 Discuss the difference between user interface (UI) and user experience (UX). (5%)

C. Sensor Networks Concepts: (10%)

C.1 Define a sensor network and explain its primary purpose. (5%)

C.2 Explain why there is a trade-off between data accuracy and communication overhead in sensor networks. (5%)

D. Programming Language Concepts: (10%)

D.1 Differentiate between a high-level programming language and a low-level programming language. Provide examples of each. (5%)

D.2 Explain the difference between a compiler and an interpreter in the context of programming languages. List the programming language skills that you have and describe how they are converting from high level code to machine-readable instructions. (5%)

E. Algorithms and Data Structure Concepts: (30%)

E.1 Differentiate between time complexity and space complexity in the context of algorithm analysis. (5%)

E.2 Explain the concept of Big O notation. How is it used to analyze the efficiency of algorithms? (5%)

E.3 Provide an example of a linear data structure. How does it differ from a non-linear data structure? (5%)

E.4 What is the purpose of sorting algorithms? Provide an example of a sorting algorithm. (5%)

E.5 Describe the concept of a hash table. How does it achieve efficient data retrieval? (5%)

E.6 Explain the difference between breadth-first search (BFS) and depth-first search (DFS) algorithms. (5%)

F. AI Concepts: (30%)

F.1 Describe the difference between supervised and unsupervised learning. Provide examples of tasks suitable for each. (5%)

F.2 What is overfitting in machine learning? Please provide a method and explain how it prevents overfitting. (5%)

F.3 What is the purpose of activation functions in neural networks? Provide examples of common activation functions. (5%)

F.4 Name popular programming languages used in AI development. Explain why Python is widely used in the field. (5%)

F.5 What is Natural Language Processing (NLP), and what are its applications in AI? (5%)

F.6 What are TensorFlow and PyTorch? How are they used in the development of AI models? (5%)