

國立臺北大學 113 學年度日間學士班轉學生招生考試試題

學制系級：資訊工程學系日間學士班 2 年級

科目：計算機概論

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可 不可使用計算機

I. Problem 1-10: Multiple-Choice Questions(單選) (50% , 5% each)

1. Which statement best describes the relationship between time-sharing and multitasking in computer systems?
 - (a) Time-sharing allows multiple users to share the same computer resources simultaneously, while multitasking allows a single user to run multiple programs at the same time.
 - (b) Time-sharing and multitasking both refer to running multiple programs on a single computer, but time-sharing specifically refers to real-time systems.
 - (c) Time-sharing is a form of multitasking where the CPU time is divided into small units and allocated to each task, while multitasking is limited to executing one task at a time.
 - (d) Time-sharing allows a single program to run continuously without interruption, whereas multitasking ensures that multiple programs run without user intervention.
 - (e) Time-sharing and multitasking are two completely unrelated concepts in computer science.
2. Which of the following statements best differentiates cluster computing from grid computing?
 - (a) Cluster computing involves geographically dispersed computers working together, whereas grid computing involves computers within a single location working as a single system.
 - (b) Cluster computing uses a centralized management system to manage a group of tightly connected computers, while grid computing uses a decentralized system to manage a network of loosely connected computers.
 - (c) Cluster computing is used primarily for high-performance computing applications, while grid computing is used only for data storage purposes.
 - (d) Cluster computing relies on virtual machines to distribute workloads, whereas grid computing relies on physical machines exclusively.
 - (e) Cluster computing and grid computing both refer to using multiple computers to solve a problem, but only cluster computing requires specialized hardware.
3. Which of the following statements best describes a property of object-oriented programming (OOP)?
 - (a) Inheritance allows a class to inherit attributes and methods from another class, promoting code reuse and extensibility.
 - (b) Polymorphism enables objects of different classes to be treated as objects of a common superclass, facilitating dynamic method invocation.
 - (c) Encapsulation restricts access to certain components of an object, ensuring data integrity and hiding implementation details.
 - (d) Abstraction allows the creation of abstract classes and interfaces, providing a blueprint for derived classes to implement.
 - (e) Functional programming is a key feature of OOP, emphasizing the use of pure functions and immutable data structures.
4. Which of the following statements does NOT describe a property of imperative programming paradigms?
 - (a) Imperative programming emphasizes describing the detailed steps required to solve a problem.
 - (b) A mutable state allows variables to be modified after they are initialized, which can lead to unexpected side effects.
 - (c) Control structures such as loops and conditionals are used to specify the flow of execution in imperative programming.
 - (d) Functional programming is a key feature of imperative programming, focusing on the evaluation of mathematical functions.
 - (e) Procedural programming is a subset of imperative programming that organizes code into procedures or functions.

試題隨卷繳交

接背面

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5. Which of the following statements best describes Artificial Intelligence (AI)?
- (a) AI refers to creating machines that can perform tasks requiring human-like intelligence, such as reasoning, problem-solving, and learning.
 - (b) AI involves programming computers to mimic human behavior and emotions accurately.
 - (c) AI is limited to the development of robots with advanced sensory capabilities, enabling them to interact with the environment autonomously.
 - (d) AI focuses exclusively on developing algorithms that enable computers to solve complex problems without human intervention.
 - (e) AI primarily involves building software systems that can think and learn on their own without human guidance.
6. Which of the following statements accurately describes ChatGPT?
- (a) ChatGPT is a programming language used for web development and server-side scripting.
 - (b) ChatGPT is an open-source operating system designed for mobile devices and IoT devices.
 - (c) ChatGPT is a deep learning-based language model developed by OpenAI for natural language processing tasks.
 - (d) ChatGPT is a cloud computing platform that provides infrastructure services such as virtual machines and storage.
 - (e) ChatGPT is a computer vision library used for image recognition and object detection tasks.
7. Suppose you want to isolate the middle 4 bits of a byte by placing 0s in the other 4 bits without disturbing the middle 4 bits. What mask must you use together with what operation?
- (a) Mask: 00001111, Operation: Bitwise OR
 - (b) Mask: 11110000, Operation: Bitwise AND
 - (c) Mask: 11110000, Operation: Bitwise OR
 - (d) Mask: 00001111, Operation: Bitwise AND
 - (e) Mask: 11111111, Operation: Bitwise XOR
8. Which of the following best describes the Turing test?
- (a) A test to evaluate the efficiency of computer processors by measuring their performance in executing complex algorithms.
 - (b) A test to assess the effectiveness of antivirus software in detecting and removing malware from computer systems.
 - (c) A test to determine a machine's ability to exhibit intelligent behavior indistinguishable from that of a human.
 - (d) A test to evaluate the quality and accuracy of machine translation systems in converting text from one language to another.
 - (e) A test to measure the usability and user satisfaction of software applications through user feedback and evaluations.
9. Which of the following stages is NOT typically part of the development phase in the software life cycle?
- (a) Planning and Requirements Analysis
 - (b) Design and Architecture
 - (c) Implementation and Coding
 - (d) Testing and Quality Assurance
 - (e) Deployment and Maintenance
10. Which of the following best describes the primary function of a Database Management System (DBMS)?
- (a) Generating graphical user interfaces for end-users to interact with databases.
 - (b) Analyzing large datasets to extract patterns and insights for decision-making.
 - (c) Managing and organizing data in a structured format to ensure efficient storage and retrieval.
 - (d) Encrypting sensitive information to protect it from unauthorized access.
 - (e) Optimizing network performance to ensure fast and reliable data transmission.

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II. Output the result of the following pseudocode: (20%)

```
BEGIN
  n = 3
  FOR i FROM 1 TO n DO
    FOR j FROM 1 TO (n - i) DO
      PRINT "a", without newline
    END FOR
    FOR k FROM 1 TO (2 * i - 1) DO
      PRINT "*", without newline
    END FOR
    FOR j FROM 1 TO (2 * (n - i) + 1) DO
      PRINT "a", without newline
    END FOR
    FOR k FROM 1 TO (2 * i - 1) DO
      PRINT "*", without newline
    END FOR
    PRINT newline
  END FOR
END
```

III. What value is represented by the bit pattern 01101111 when interpreted using a floating-point format where the most significant bit is the sign bit, the next three bits represent the exponent field in excess notation, and the last four bits represent the mantissa? (10%)

IV. The booting procedure is the process a computer system undergoes when powered on. Give a summary of the key steps involved in the booting procedure. (10%)

V. Output the result of the following pseudocode: (10%)

```
FUNCTION f(n)
  IF n == 0 THEN
    PRINT n
    PRINT "end"
    RETURN 1
  ELSE
    PRINT n
    RETURN n * f(n - 1)
  PRINT n
  END IF
END FUNCTION

BEGIN
  SET result = f(3)
  PRINT result
END
```

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