國立高雄應用科技大學
101 學年度碩士班招生考試
電子工程系

准考證號碼□□□□□□□□□□　（考生必須填寫）

計算機概論（丙組）

注意：a.本試題共 7 題，共 100 分。
　　　b.作答時不必抄題。
　　　c.考生作答前請詳閱答案卷之考生注意事項。

1. For computer programming languages and language translators,
   (a) Please explain the relationships among machine codes, assembly languages, and high-level languages. (6%)
   (b) Please explain the difference between an interpreter and a compiler. (4%)
   (c) Please explain how the "bytecode" generated by a Java compiler differs from the native machine code generated by a C compiler. (4%)
   (d) There are 3 functional blocks invoked in sequence during the translation of a source program into the object program. Please list their names and explain their functionalities. (6%)

2. Please list the phases in software development, i.e. the software life cycle. Please detail the tasks in each phase. (8%)

3. Please write down a program segment either in C, BASIC, or Java, to sort an integer array with 10 elements in ascending order. The content of the array is assumed. (10%)

4. For a typical memory system,
   (a) Draw the entire memory hierarchy, from registers in CPU down to auxiliary storage, indicating the trend of access speed, size and unit cost. (6%)
   (b) Explain the similarity and difference between the concepts of cache memory and virtual memory. (6%)

5. In the context of computer architecture, please explain the following terminologies: (15%)
   (a) Pipelining Technology
   (b) Redundant Array of Independent Disks (RAID)
   (c) Interrupt-driven I/O
   (d) Single Chip Micro-controller
   (e) Cloud Computing

6. For the Internet,
   (a) Please list at least 4 typical access technologies at the link-layer, such as ADSL. (4%)
   (b) Please list at least 4 typical applications (services) at the application-layer, such as E-mail. (4%)
   (c) Please explain the difference between the service paradigms of "Client-Server Architecture" and "Peer-to-Peer Architecture". Please give examples in your discussion. (6%)
   (d) Please explain the difference between "User Datagram Protocol (UDP)" and "Transmission Control Protocol (TCP)". Please list typical applications of each in your discussion. (6%)

7. For information security,
   (a) Please explain the following security services: (8%)
   Confidentiality, Authentication, Integrity, and Non-repudiation
   (b) Please explain the difference between symmetric-key encryption system, such as DES, and public-key encryption system (asymmetric-key system), such as RAS. (4%)
   (c) Please explain how firewall can be deployed to improve the system security in a networked environment. (3%)