A. **Translations:** Please translate the following sentences into Chinese.

1. (5 points) *The importance of code optimization in software implementation cannot be overestimated.*
2. (5 points) *Our server works none the worse for the highly concentrated requests from client sites.*
3. (5 points) *The decoding time is proportional to the ratio of the number of coded images to the number of decoders.*
4. (5 points) *Given a directed graph G, the transitive closure of G has the same vertex set as G but has an edge from v to w if and only if there is a path from v to w in G*

B. **Short Composition Writing:** Follow the following guidelines to write a short composition:

5. (5 points) Paragraph 1: write at most five sentences to describe what motivates you to study in a graduate school of computer science.
6. (10 points) Paragraph 2: write at most five sentences to describe your future research direction(s).
7. (5 points) Paragraph 3: write at most five sentences to conclude with the outlook for your graduate study.

Please number your paragraphs with the given question number (i.e., 5, 6 and 7) on the answer sheets for easier identification.

C. **Reading Comprehension:** Read the following **five** passages. Each passage is followed by questions based on its content. After reading a passage, choose **the best answer** to each question. Answer all questions following a passage on the basis of what is **stated** or **implied** in that passage.

(3 points for each question)

Passage 1

Computer science is the discipline that seeks to build a scientific foundation for such topics as computer design, computer programming, information processing, algorithmic solutions of problems, and the algorithmic process itself. Consequently, it provides the underpinnings for today's computer applications as well as the foundations for tomorrow's applications. It follows that we cannot become knowledgeable in computer science by studying only a few topics as isolated subjects or by merely learning how to use the computing tools of today. Rather, to understand the science of computing, we must grasp the scope and dynamics of a wide range of topics.

This book is designed to provide such a background. It presents computer science through an integrated introduction to the subjects that constitute a typical university computer science curriculum. The book can therefore serve as a foundation for beginning computer science students or as a source for other students seeking an introduction to the science behind today's computer-oriented society.

8. What does the author think about computer science?
   (A) We can be knowledgeable in computer science by studying only computer design.
   (B) Information processing is the most important topic in computer science.
   (C) Computer science is the training of seeking a scientific foundation for computers.
   (D) The author likes computer science very much.
9. What do you think the book is about?
   (A) Computer design.
   (B) Database systems.
   (C) Algorithmic solutions of problems.
   (D) Introduction to computer science.

10. What is the book designed for?
    (A) Providing a background of studying computer science.
    (B) Explaining the algorithmic process itself.
    (C) Providing algorithmic solutions of problems.
    (D) Underpinning the importance of information processing.
11. How can we, by the suggestion from the author, become knowledgeable in computer science?
    (A) Study only a few topics that we are interested in.
    (B) Grasp the scope and dynamics of a wide range of topics.
    (C) Underpin for today's computer applications.
    (D) Learn computer programming.

Passage 2

The portion of an operating system that defines the interface between the operating system and its users is often called the *shell*. The job of the shell is to communicate with the user, or users, of the machine. Modern shells perform this task by means of a graphical user interface (GUI) in which objects to be manipulated, such as files and programs, are represented pictorially on the monitor screen as icons. These systems allow users to issue commands by pointing to and pushing these icons on the screen by means of a hand-held device called a mouse. Older shells communicate via users through textual messages using a keyboard and monitor screen.

12. What is a shell?
    (A) An operating system.
    (B) A graphical user interface (GUI).
    (C) A system that allows users to issue commands by pointing to screen..
    (D) A part of an operating system.
13. What is job of a shell?
    (A) To sell operating systems.
    (B) To communicate with the users of the machine.
    (C) To use keyboard and monitor screen.
    (D) To provide computer games.
14. What does the author think about a shell?
    (A) Old shells are better than new shells.
    (B) New shells are better than old shells.
    (C) Shell defines the interface between the operating system and its users.
    (D) A shell must have a graphical user interface (GUI).
15. What does a modern shell allow users to do?
    (A) Issue commands by pointing to and pushing icons.
    (B) Draw graphs.
    (C) Use the computer with a hand only.
    (D) Use the computer as a hand-held device.

Passage 3

Data that is stored more-or-less permanently in a computer we term a database. The software that allows one or many persons to use and/or modify this data is a database management system (DBMS). A major role of the DBMS is to allow the user to deal with the data in abstract terms, rather than as the computer stores the data. In this sense, the DBMS acts as an interpreter for a high-level programming language, ideally allowing the user to specify what must be done, with little or no attention on the user's part to the detailed algorithms or data representation used by the system. However, in the case of DBMS, there must be far less relationship between the data as seen by the user and as stored in the computer, than between, say, arrays as defined in a typical programming language and the representation of those arrays in memory.

16. What is a DBMS?
    (A) A database system.
    (B) A kind of memory like DRAM.
    (C) A database management system.
    (D) A data manipulation system.
17. What do you think the paragraph is about?
    (A) Computer design.
    (B) Database systems.
    (C) Algorithmic solutions of problems.
    (D) Introduction to computer science.
18. What does the author think about a DBMS?
    (A) A DBMS allows the user to specify what must be done by the system.
    (B) A DBMS is a high-level programming language.
    (C) A DBMS uses arrays as defined in a typical programming language.
    (D) A DBMS has no relationship between the data and the user.
19. What is the major role of the DBMS?
    (A) The DBMS is the father of a database.
    (B) The DBMS defines the relationship between the data as seen by the user and as stored in the computer.
    (C) The DBMS specified the detailed algorithms and data representation used by the system.
    (D) The DBMS allows the user to deal with the data in abstract terms.

Passage 4

A computer architect designs machines to run programs. If you were going to design a computer, your task would have many aspects, including instruction set design, functional organization, logic design, and implementation. The implementation may encompass integrated circuit (IC) design, packaging, power, and cooling. You would have to optimize a machine design across these levels. This optimization requires familiarity with a very wide range of technologies, from compilers and operating systems to logic design and packaging.

Some people have used the term computer architecture to refer only to instruction set design. They refer to the other aspects of computer design as "implementation," often insinuating that implementation is uninteresting or less challenging. The authors believe this view is not only incorrect, but is even responsible for mistakes in the design of new instruction sets. The architect's or designer's job is much more than instruction set design, and the technical hurdles in the other aspects of the project are certainly as challenging as those encountered in doing instruction set design.

20. What do the authors believe?
    (A) Computer architecture should not be referred only to instruction set design.
    (B) A computer architect is responsible for mistakes in the design of new instruction sets.
    (C) A computer architect has an incorrect view.
    (D) The architect's job is instruction set design.
21. What do you think is the best title for the paragraphs?
    (A) A computer architect that has an incorrect view.
    (B) The job of a computer designer.
    (C) The importance of instruction set design.
    (D) The aspects of the project that are certainly as challenging as those encountered in doing instruction set design.

22. What do you do when you were going to design a computer?
    (A) Draw the picture of the computer of your design.
    (B) Run programs in a computing machine.
    (C) Design instruction set, functional organization, and implementation.
    (D) Get a pencil and a pile of papers.

23. According to the passage, what may the implementation encompass?
    (A) Program design and project management.
    (B) Not only incorrect, but even responsible for mistakes.
    (C) Instruction set design.
    (D) IC design, packaging, power, and cooling.

Passage 5

A typical early computer network consisted of isolated machines that could do little more than transfer files over temporary telephone connections using software that was added to the machines' operating systems in the form of utility software. Today, the interaction of machines via networking is much more extensive, and modern operating systems, being designed with networking in mind, are beginning to incorporate many of these features. For instance, software implementing the TCP/IP protocol suite is supplied as a part of many of today's operating systems.

24. What is the focus that the passage describes?
    (A) Modern operating systems.
    (B) TCP/IP protocol suite.
    (C) Telephone connections.
    (D) Networks.
25. What does a typical early computer network do?
    (A) Transfer files over temporary Internet connections.
    (B) Transfer files over temporary WWW connections.
    (C) Transfer files over temporary telephone connections.
    (D) Transfer files over temporary BBS connections.
26. What is the impact of a computer network today?
    (A) The use of ADSL is popular.
    (B) The interaction of machines is extensive.
    (C) The network games are very popular.
    (D) We don't need to transfer files any more.
27. What is the network feature of modern operating systems that is mentioned in the passage?
    (A) TCP/IP protocol suite.
    (B) Temporary telephone connections.
    (C) File transfer.
    (D) The interaction of machines.