

1. (40%, 2 points for each problem) Please define the following terms and explain the content, purpose, and application of each term and give an illustrative example if possible. If possible, define the term in mathematical equation. If it is an acronym, please write the full name. For example:

CD-ROM: Compact Disk-Read Only Memory: the most common type of optical storage medium; data is written in a series of lands and pits on the surface of a disk, which can be read by a laser in a CD-ROM drive; stores approximately 650 MB but cannot be altered.

(1) Trojan horse virus (2) spam (3) CPU (4) hard disk swap in (5) DDR (6) ASCII (7) MFC (8) computer vision (9) TCP/IP (10) TFT LCD (11) Unicode (12) USB (13) router (14) assembler (15) DVD (16) WWW (17) FAT32: File Allocation Table (18) FTP (19) APP (20) ALU

2. (4%) What's the one's complement and two's complement of 10011100?

3. (8%) Please write the Boolean functions of full adder with inputs: A, B, C, and outputs: sum, carry.

4. (8%) Please use the above full adder to implement 8-bit adder/subtractor with two's complement and draw block diagram.

5. (3%) What is GUI? If an operating system does not support GUI, what does it support?

6. (7%) What are the seven layers of Open Systems Interconnection (OSI) protocols?

7. (6%) Please list at least three network topologies and draw the diagram.

8. (6%) Please list at least three operating systems for mobile phones.

9. (8%) Please explain depth-first search and breadth-first search. Please draw a binary tree and show the different outputs.

10. (10%) Please explain bubble sort and quick sort in detail and their time complexities.

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